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FIXING AND WASHING GELATINO-BROMIDE ENLARGEMENTS.

Now that so many photographers are making their own enlargements on bromide paper, it will doubtless be to the advantage of some of our readers to give a few hints on the fixing and washing of them, so that the greatest degree of permanence may be secured with the least amount of trouble. No information on this point is required by those engaged in this work commercially, therefore it is not for them that our instructions are intended, but rather for those who only make an enlargement or two occasionally, and whose appliances are not adapted to washing prints above the ordinary dimensions.

In the present article we shall confine ourselves to the practical, and sink the theoretical part of the subject, as that has so frequently been dealt with in connection with negatives; and what applies to negatives applies equally well to paper. We shall assume that permanence of the picture is the end in view, and that towards its attainment a little extra time and trouble will not be grudged. Here are the appliances necessary:—A dish or tray to contain the fixing solution, and another for washing the prints; a rose, like that of a garden watering-pot, with very fine holes. This must be fixed in a piece of india-rubber tubing, eighteen inches or two feet long, attached to the water supply. A couple of glass plates, somewhat larger than the pictures to be treated, and a rather soft squeegee. Instead of glass, thin sheets of ebonite mounted on boards to give rigidity, may be substituted with advantage, as they are less fragile than glass.

An important point in connection with the fixing of bromide prints is pointed out by Mr. E. W. Foxlee in *THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC*, namely, that all trace of acid should be thoroughly eliminated before the picture is introduced into the fixing bath, otherwise there is a danger of a sulphuretting the action being set up—a fact too often overlooked. Taking the picture in hand from the developing stage the first thing to be done is to free it from the acid. This may be easily and quickly accomplished by washing if a good pressure of water be available; and we prefer simple washing to treating the print with an alkali.

The print is placed face upward on a glass or ebonite plate, and a stream of water from the rose is directed upon it with all the force that can be obtained. This will quickly wash out the acid if the development has been conducted from one side only, but if the development has been effected by immersion then the back as well as the front must be similarly washed. A slip of litmus paper pressed on the surface of the print, after slight

draining, will always indicate if the acid has been removed. Experience will soon teach the operator when this has been accomplished without the necessity of testing chemically. The print is next freed from water as much as possible by draining, or, better still, by laying it on one of the glass plates and passing the squeegee lightly over the back. It is then ready for immersion in the fixing bath. This should consist of two pounds of hyposulphite of soda dissolved in a gallon of water and made slightly alkaline.

When the print is placed in the bath it should be kept constantly in motion for the first five minutes, and occasionally for the remainder of the time—not less than twenty minutes. The picture is then removed and placed face downward on one of the plates and the back squeegeed somewhat firmly to remove as much as possible of the "hypo" solution. It is then immersed in a dish of clean water and kept in motion for a few minutes. It is now removed and placed on one of the plates and the back squeegeed, and next it is removed to the other plate face upward, and a stream of water from the rose with full pressure directed upon it. Then it is transferred to the first plate again, this time with the face downwards and the back similarly treated. After this operation has been repeated on both sides, two or three times, the back is squeegeed and the print again put into clean water and allowed to soak for ten minutes. It is then removed and subjected to the syringing and squeegeeing operations as before.

By alternate soaking for ten minutes or so, and treating the picture as directed, the last trace of the hyposulphite can be more completely removed from the enlargement in an hour and a half, or two hours, than it may be with twelve hours or more of continuous soaking, even in running water, notwithstanding that the paper itself may be thick. The force of the fine jets of water from the rose dashes, as it were, the hypo out of the paper. It is needless to point out that the plates used for supporting the prints during the operations of squeegeeing and syringing should be thoroughly rinsed each time the picture is removed.

The directions here given for washing gelatino-bromide enlargements apply also to albumen prints. By treatment similar to the above, hyposulphite may be more thoroughly removed from a picture in an hour or so than it often is by simply allowing it to remain soaking in water for a whole day.

In the *ALMANAC* article referred to two fixing baths are recommended to be employed. This is highly desirable when working on a commercial scale or when a large number of prints are fixed in the same solution; but it is scarcely

necessary when only one or two have to be dealt with, provided the solution be new and there is plenty of it, and, what is of equal importance, the prints are kept constantly moving about whilst they are in the solution.

THE progress of the great Lick telescope has been a subject of great interest to the scientific of our readers ever since its inception, which the recent disaster to the extra disc which was being ground to curves suited for photographic purposes has only served to intensify. For some little time to come the fate of the perfected discs will be in suspense, as they are now about to set out on their journey across the continent of America. The lenses have been worked to the required surfaces at the works of Messrs. Alvan Clarke & Sons, in Cambridge, Mass.; and as their destination is in California it is evident they have a journey of some thousands of miles before them.

IN order that this journey may be safely performed precautions of the most careful and elaborate nature are being taken. Most photographers, probably, have, in the experience of a lifetime, wrapped up a large lens and found it a task requiring considerable care; what must be the case when the weight of the unmounted lens alone is counted by hundred-weights and the diameter is over three feet! However, the huge lenses are wrapped up, but in cloth instead of paper, and, in order to ensure freedom from scratches, the fabric has been washed many times and thoroughly beaten; it is then tightly wrapped round the discs. After the cloth comes a thick layer of paper. The box to hold the lenses is of wood, and is shaped to conform to the figure of the lenses; it is lined with felt, and the costly discs are packed tightly within. The felt is attached with glue, no nails being used anywhere near the glass.

THIS would seem to be precaution enough, but it is only the beginning; the wood box is packed into a strong steel box of cubical shape, curled horsehair being the packing material. This steel chest is again placed in another of similar material, and kept from touching it by a series of spiral springs which stud the whole inner surfaces of the last chest, both being made air-tight and waterproof. Finally, the last steel casing is packed with asbestos to make it fireproof, and the whole is slung within a wooden framework. There is yet a further provision for turning the chest round day by day on its journey, by a quarter turn at a time, the object being to prevent any molecular disarrangement and avoid the possible production of polarisation. The whole is insured for fifty-one thousand dollars.

IN making gold assays a certain amount of the material containing the precious metal is taken, and, after being melted with metallic silver, the latter is dissolved away, when the gold is left behind, and, after heating, weighed. When, however, the precious metal in the sample is excessively minute in quantity, the weighing of the small proportion left after the above operation becomes an operation requiring the greatest nicety of handling and delicacy of weighing. A very neat method of estimating these exceedingly small quantities was described in a paper by Herr Gozdorf, in a recent number of the *Chemical News*. Instead of weighing the gold, it is measured; the last drop of washing water with the contained gold particles, is guided on to a sheet of aluminium foil, and, after drying, picked up by a bead of borax in a loop of platinum wire. Upon heating before the blowpipe a perfect sphere of gold is obtained, and can be measured under the microscope with great accuracy, its weight being proved by reference to a table of constants. The writer states that the smallest bead he has measured was one a little over the two-millionths of a grain—a weight, we need scarcely say, utterly beyond the powers of the most delicate balance to estimate.

AMONG those who undertake the tinting of photographs at a cheap rate Naples yellow is a great favourite, the flesh tints can be produced so rapidly and effectively by its aid; but we would utter the strongest warning against its use. It is certain to go. We recently saw some very clever tinting in which it had been employed, and in a very short time the carnations had assumed a most ghastly hue.

OXALIC ACID has long been known as being readily decomposed by sunlight, and according to M. E. Duclaux, in the *Comptes Rendus*, a process, long sought by physicists, for measuring the chemical power of the sun's rays with accuracy may be found by utilising the above action. Certain precautions have to be taken, such as the use of flat vessels into which the same quantity of acid is always used; and taking a solution of three grammes per litre, he states the results to be very constant.

THE advantage of reducing wastes to the smallest possible bulk prior to sending them to the refiner or commencing to reduce them at home, cannot be too strongly impressed upon those who may now be collecting them. The smaller the bulk to be treated the fewer will be the crucibles, and the smaller the quantity of flux required, to say nothing of time and fuel. Many consider that if the paper be simply burnt to a cinder it is all that is necessary. But, in this cinder state, the residue occupies considerably more space than is desirable, and also is of greater weight. If, after the paper has been apparently consumed by ordinary burning, the cinders are placed in an old iron pot on the fire, they will, after a time, be converted into a pale brown or white ash which is very compact and heavy. Ashes so obtained, if the paper has been sensitised on baths of the ordinary strength, will generally contain about half their weight of pure silver.

THE chloride from the washing waters, and the sulphide from fixing baths, should always be thoroughly dried; this may easily be done in the kitchen oven. These should then be reduced to powder in a mortar, and, if time can be spared, passed through a coarse sieve. If residues were always thus treated the cost for their reduction would be far less, in most cases, than it is at present, while the returns would be eminently more satisfactory to all concerned.

SULPHURATION OF BROMIDE AND PLATINUM PRINTS.

IF ever I deliberated long and anxiously before writing an article for these pages I have done so before writing the lines that will face the readers of this JOURNAL as they peruse what I am about to write. In fact, I had some time ago written an article that would have covered a page of THE BRITISH JOURNAL OF PHOTOGRAPHY, but fearing to do any injustice to any one, or to lay myself open to the charge of perfunctory experiment, I laid aside what I had written, commenced a new series of experiments, read for perhaps the twentieth time what has of late been written on the subject with which I have to deal, and only after careful study and earnest thought I have written this, my second attempt, to throw some light on the question of the comparative durability of paper prints.

The feeling is very present to me that I may be wholly misunderstood in my intentions, that I may even be suspected or accused of either interest in one or prejudice against another process of printing—though whence my partiality could arise I cannot conceive—that some one may imagine I have a personal motive in my comparison between one process and the other. I can only say—and those who are acquainted with me will be ready, I am sure, to bear me out—that I have not the slightest partiality for any one process nor against any one person or process; that my experiments were made solely with a view to discover facts; and that my history of these experiments is given without fear or favour exactly as they occurred, and with deductions exactly as they presented themselves to my mind, whether rightly or wrongly. My trouble will be entirely lost, and I shall be very greatly disappointed, if my tests are not repeated by other persons, and if these persons, having followed me in my experiments, do not either corroborate or confute me.

Be it clearly understood that I am attacking no process; I own the "permanence" of several classes of prints on paper. A great deal has been written with a view to define "permanence," and the word "absolute" has been allowed to creep into the attempts at definition. I disown all knowledge of permanence absolute; there is no such thing in the universe. And another confusion has crept in regarding permanence, that is, a mixing up injudiciously, and a separation equally injudicious, of the image itself and the material that supports it. Both the image and its support must be permanent alike. What is

the use of a permanent image on a decaying sheet of paper? or what is the use of a permanent sheet of paper or plate of metal if it bears a fading, fleeting, decomposing image? None whatever. A print can only have value, real or nominal, if the whole print be fitted to withstand the test of time, or, more accurately, the baneful influences that must reach it in space of time. Time or age is a mere abstract idea, and can never hurt nor in any way affect anything; what we have to do with are conditions and changes and events that happen during time. The print, I say, must be impervious throughout its whole body to noxious influences; it is no gain to it or to us if one constituent fails, however well the rest of it may endure.

Now in the general acceptance of the word—certainly the word as I mean to use it—when we talk of a “print” we mean some image on paper or on some textile material. At all events, we do not mean an image on a sheet of metal or glass, if we mean such a print we say so—“glass positive,” “opal print,” or some such distinguishing name. I say, then, that a print is of no value, as far as permanence goes, if either the paper or the image is not permanent. It does very well for a convenient definition to say that an image is “permanent” if it lasts as long as its support, but in practice a print is not permanent if it is not *all* permanent. We don't want the bones if the flesh be decayed; a skeleton is not an ornament for every lady's drawing-room.

It is time for me to get more specially to the point of all this. Every one who reads the photographic papers is aware that not long ago grave doubts were thrown upon the lasting qualities of what we call bromide paper prints, first by the Autotype Company, who tried to draw comparisons between their own products and bromide paper in the matter of permanence by induction, and between bromide prints and albumen silver prints by analogy. They acknowledged the permanence of platinotype prints, and were soon followed by Mr. H. B. Berkeley, of the Platinotype Company, in a trilogy of letters to this JOURNAL, more remarkable for its length than for any sound arguments to be found in its text. I wish at once to get rid of the question of autotype prints, and I have great pleasure in saying that though I put them to tests of the same kind and rigour as those to which I put the other prints, the autotypes passed the ordeal, if not unblemished, at least in a way that greatly astonished and pleased me. It is true that my tests were not specially directed against the components of an autotype print, but I expected that even autotype would succumb to the tests I did apply. I repeat I was much pleased to find that one process at least withstood what was undoubtedly a severe test, and a test certain to be met with in greater or less degree in the actual life of any print—the test of sulphuration.

But it is with Mr. Berkeley I have now to deal, and if he thinks my dealing ungentle he must blame the statements he has so often rushed into, both in championship of his own process and in discredit of others.

With regard to platinotype. For years we have constantly been hearing the praises of platinotype, and nobody ever seems to have investigated the matter very particularly, and we have got to accept the permanence of platinum prints, as the Platinotype Company have always given it to us, as an axiom. It is a curious trait of human nature that if any one only goes on long enough asserting a thing, or assuming a thing as an incontestable fact, many persons will come to believe and to assume the thing asserted. I have no doubt that were I to assert with considerable violence and reiteration to the public that I was the discoverer of the law of universal attraction, I should soon be able to fill a large church with believers in my claim. History is full of examples of successful assertion. I suspect this is the case with platinum prints. I have always heard a platinotype spoken of as a thing imperishable, and “that fadeth not away,” and I never thought until lately of doubting it. I had heard of the experiments by Mr. Spiller alluded to by Mr. Berkeley in No. II. of his trilogy (page 691), but I do not now remember what these tests were; as Mr. Berkeley says some of them damaged the pulp of the paper, I gather that these ones at least were different from mine. I have heard of boiling acids being used as tests; not thinking that boiling acids are frequently met with in our average atmosphere, I did not try them; and seeing that Mr. Spiller's tests did not affect the platinum prints, or at least the images, I conclude that Mr. Spiller omitted to try my test, which was sulphuretted hydrogen in water, a very common impurity indeed, according to Mr. Berkeley and myself, in our air.

In Mr. Berkeley's letter No. III., as I pointed out lately, he brings in some very curious analogies between reduced images in bromide paper and such things as “silver spoons, Daguerreotypes, German gold,” &c. Analogies, when *perfect* and *complete*, are valuable arguments; when *partial* or *one-sided* they are most dangerous. On the very face of the question I maintain it is monstrous to compare a bromide print to a silver spoon, one has only to look at the two to see that comparison fails; whether they are the same in nature or not, they are visibly different in condition. But they are not even the same in composition, as surely every one knows, for each pound of silver contains eighteen pennyweights of copper. I do not say that copper is the cause of tarnishing, but I say that its presence forbids all analogy such as Mr. Berkeley would draw. All the same, if Mr. Berkeley feels inclined to be generous, and presents me with a service of plate, I am ready to overlook the copper. If he does not wish to go quite so far, I will only suggest that a certain teapot of mine is getting thin.

In the same letter No. III., “because” Nos. 4 and 5, he says, “Because a reduced silver print is not able to withstand, for many minutes even, dilute solutions of various chemicals, several of which are often found in the air we breathe in considerable quantity, . . .” and (No. 5) “because among these are sulphurisers.” This sort of assertion he carries on for several paragraphs, assuming everything that seems to suit his own argument, but without the least apparent consideration as to whether his foundation is firm or not.

It lately occurred to me that it would be well to put bromide paper to some of the tests suggested by Mr. Berkeley's letter and my own mind, and I thought that when I was about it I might as well test a few platinotype prints along with the bromide ones. Of course, as platinotype is so well known, so universally admitted to be permanent, I thought I should have vast trouble, if I succeeded at all, in hurting a platinum print, still I resolved to try it just for fun. Mr. Berkeley's letters pointed to sulphuration as the disease most likely to attack bromide prints (and spoons and “German gold”), so sulphur was chosen for my first tests, and in particular sulphuretted hydrogen in water. Mr. Berkeley's concluding sentence in his correspondence runs thus:—“Let the statement go forth that some, or many, suppose that reduced silver prints will prove more lasting than the albumenised ones (this is the truth; they *do* think so).” Well, I *did* think so, and to try whether I was right or wrong, I included silver albumen prints in my experiments.

The albumen prints I used were made by myself with my usual care. The bromide prints were made by myself with probably less than my usual care, for they had been under exposed; but I found no claim on that fact. The platinotypes were, one by a well-known amateur who prints little else besides in platinum, and the other by a professional whose name is intimately connected with commercial platinum printing in this country. The bromide paper was Eastman's “B” and “C.” My sulphuretted hydrogen was made by the action of sulphuric acid on iron sulphide, and I need not relate the incidents that attended my first manufacture of this perfume, nor tell how I stopped just in time the despatch of a mounted messenger for a plumber to see to the gas-fittings. This is matter of history, if not of hysterics!

I made a considerable quantity of H_2S and saturated water with it, used some at once, and stored away the rest for after use. My first test consisted in immersing all in one bottle, a scrap each of an albumen, a bromide, and a platinum print. In a very short time, about an hour, the albumen print was utterly and hopelessly ruined. So I do still think that, so far as sulphuration is concerned, “reduced silver prints are more lasting than albumenised ones,” and it will take a good deal to make me think otherwise. The folly of continuing to test albumen prints was so evident, that I removed the spoilt print and preserved it, and shall waste no more time with *that* subject. Mr. Berkeley may wish to continue the test, but I do not.

After about thirty-six hours I removed the platinum and bromide prints from the H_2S , but it was evening, and by gaslight I could not see the result of my test. Next morning, however, vast was my astonishment to find the platinum print completely yellow—the image side, not the back—while the bromide was, so far as I could see, as perfect as when I put it into the bottle. Of course, knowing the absolute permanence of platinotype, I put the whole thing down to a

blunder; I felt certain a bad fairy had changed the prints during the night. So, like the young woman, I "did it again." But in spite of the permanence of platinum and the well-known fugitiveness of bromide paper, and the silver spoons and the German gold, and the "infinitesimal film," and Mr. Berkeley, in spite of all these things the bromide print again, after thirty-six hours, was far superior to the platinotype. I gave up the "bad fairy" theory and put the result down to my own "blarney" ignorance and credulity. I tested my eyes for colour-blindness, but all in vain, I was forced to admit that the platinum print had "yellowed" and the bromide had not.

Then I put the scraps—fresh ones—in separate bottles of water and H_2S , and kept them seventy-two hours, and even five days, and it was always the same, the bromide came out better.

I tried a dilute solution of sulphurous acid, perhaps too dilute, for it did not affect either of the prints; had I made it stronger I dare say the platinum print would have gone wrong. I made other tests, and I found that invariably, so long as I did not destroy the gelatine, the bromide prints stood my tests satisfactorily. Chlorine, for instance, took the gelatine right off the paper, just as it did with an autotype print, and it bleached the image entirely out of a negative on a certain tissue. But sulphuration was Mr. Berkeley's cry, sulphuration was my test, sulphuration is the disease our prints have chiefly to undergo, and on the test of sulphuration the bromide prints completely vanquished the platinotype prints in my hands. I cannot well conceive how I could be mistaken in the results of so many tests (I made ten in all); but I trust some one will follow me and say whether by some extraordinary mistake I have been misled. I have gummed my scraps, with bits of the original prints, upon a piece of cardboard, and I send it to the office of this JOURNAL, where, no doubt, the "Boss of the Show" will allow any one to examine them. I ask every one to look at the prints both back and front, it will be seen that it is the front of the platinum prints that has yellowed, not the back. I do not care whether it is the back or not, my business is with prints; none the less it is the front, the image, which has gone wrong.

With a very few remarks I now leave the subject. My tests were so simple, and the results are so patent, that comments appear to be needless. It is a matter of no interest, or at least no importance, to me whether platinotype fades under sulphurating influence or not, for I cannot make a platinotype print that I care to look at; "damp," I am always told. But it was important that I should test bromide paper; I did it, and I have stated the result, to me most satisfactory. Mr. Berkeley cast doubts upon bromide paper; some of his doubts have proved baseless with regard to bromide, but well based as to platinotype prints—*comparatively*. The bromide prints suffered after a time, as will be seen on the card at the office.

I am not condemning as fugitive platinotype prints; the test I put them to was out of all reason, and I maintain that platinotype prints are what we call "permanent," but that they are injured by a solution of H_2S in water—more so than permanent bromide prints. Even albumen silver prints may, perhaps, be called "permanent," so far as sulphuration is concerned, only much less so than platinum.

But I sincerely trust that this may be a lesson to all who make assertion stand for argument or proof, and who are ready without proof, with nothing but a string of supposititious speculations, to condemn products other than their own.

I shall, when I have time, test prints with other impurities found in our atmosphere; not that my tests will in any way affect what I have said in the above lines, but simply for my own satisfaction.

ANDREW PRINGLE.

P.S.—Having found a bromide print with whites more pure than those of the prints I used before, I have tested it in sulphuretted hydrogen along with platinotype prints, and I send the results. This time, I think, the bromide print has suffered more deterioration than the platinum ones, still there is no doubt that the prints are all considerably damaged. With a test of such severity minute comparison of degree is a matter of little moment. Sulphuretted hydrogen injures both bromide prints and platinum prints—let us say—*considerably*.

OXYGEN MAKING.

PERHAPS a few hints upon the above subject may be of service at the present season, and may save one or the other reader from some expense and trouble. From expense, because when properly purified

the gas may just as well be made from the common and cheap chlorate, which reduces the cost materially; and from trouble, because after some experience the time of the operation may be reduced a great deal.

Retorts.—Cast-iron retorts are a great deal the most lasting, though I suppose if an explosion did occur their fracture would be more dangerous than if of wrought iron. They can be got made specially, which are better than the old mercury bottles, and more convenient; one such costs about 12s. 6d., and will last a lifetime. A friend of mine adopts another plan. He bought a Papin's digester at Benet-fink's, and got them to fit a bent gun-barrel to it. Thus he had a retort with a safety valve which is very handy to wash out, the top coming quite off, and leaving a mere open pot to clean. The tube should be amply large to avoid choking with manganese dust, and I must say I much prefer to have a safety cork somewhere. It would not be much use in case of an explosive product, but it would prevent any bursting through a choked pipe, which has happened by carelessness, though it never ought to do. No one with any experience buys a copper retort, which is only adapted to yield a few more shillings to the seller for no value whatever. The value of wrought iron depends upon the thickness, of course; it is bound to be eaten through in time by the nascent gas.

Making Gas.—There is nothing equal to a gas furnace, of almost any sort; but it is better if possible to have the whole affair arranged so high from the ground that the flame can be seen and the tap adjusted instantly without uncomfortable stooping. The proportion of material stated in the manuals is one part of powdered manganese oxide to two parts of potass chlorate, by weight; and it is best to begin with that. Buy crystals of chlorate, not powder, but crush to small size all unusually large lumps, and pick out most carefully any tiny bits of straw, or paper, or wood, which in the cheap quality are sometimes found swept up from the floor of the store bin. All this can be done in a minute or two for a lot of fourteen pounds, spreading out the whole heap on a sheet of the *Times*. If not done the large lumps are generally wasted. The proportion named will hardly ever give any startling rush of gas unless a very fierce furnace is employed. Turn up the flame well till the early bubbles have come over, and then turn down a little, but not much. In nearly all cases the gas will come over steadily. Allow about one pound chlorate to four and a half feet of gas. The best plan is to mix a lot at once—say fourteen pounds of chlorate—with the manganese, and then keep the mixture in a large tin canister with a hinged cover. It is another good plan to cut an old coffee canister to a size which just holds the "charge" necessary to fill the bag, as found by trial, and also to keep in the large canister a tin funnel with large spout, and a small scoop—I use a garden trowel, but made with a back like a scoop. Then every time you can shovel up your exact charge, and funnel it into the retort at once. It should be gently shaken evenly over the retort floor, or roughly levelled, and not left in a heap.

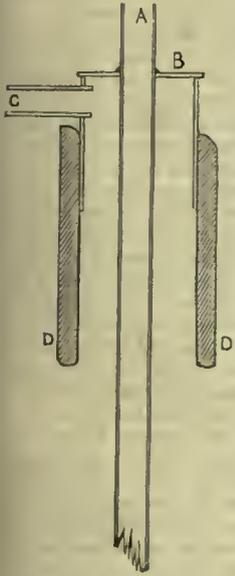
But, after a little practice and watching of the behaviour of the stuff, it is well gradually to reduce the proportion of manganese, first to one in three, and finally to one in four, or less. The gas will now come off much more quickly, so that a ten-foot bag (40 × 32 × 24) may be filled in fifteen minutes; but it would be by no means safe for a novice to begin with such a proportion. As soon as ever the bubbles come quickly, it is necessary to turn most gas furnaces down to about half flame; generally even so the gas soon increases, and, rather *before* it has got to the rush considered safe, the flame must be lowered still more, or something or other will be blown off by mere pressure. When in full swing the evolution of gas will go on with little check long after the flame is quite out, and it is this behaviour which the beginner has to learn before he tries to hurry matters. On the other hand, at first he will turn down too much sometimes in over caution, and the gas will stop, when it takes a good while to start it again. Getting a bag filled quickly really depends upon avoiding both mistakes, and by timely adjustment keeping the process going at a fairly rapid rate from first to last. This rate is much faster than a novice would suppose at first, but it would not be safe to work up to it otherwise than gradually.

Such a rate of work will always deposit some manganese dust in the tube between the retort and first wash bottle, and it is very important that this—both the retort pipe and the rubber tube—be

perfectly cleared before the next operation. To avoid this, some use the manganese finely granulated instead of powdered. I have had no experience of it in this state. The well-known caution about any possible contamination with carbon need not be enlarged upon here; but one cannot be too particular in insisting, under all circumstances, upon the rubber tube being taken off the retort delivery tube *before* the retort is removed from the flame. If this is neglected, and the retort should become perceptibly cooled while still connected with a wash bottle, there will be a partial vacuum, water would be sucked back into a highly-heated iron vessel, and the result would be a *steam* explosion. It will be seen, therefore, that under given circumstances there might occur either an *over-pressure* explosion, a *carbon* explosion, or a *steam* explosion. To see these things is to disarm them. The arrangements immediately described offer an effectual safety valve against mere over-pressure. But the pipe, from retort right down into the wash bottle, should on no account be less than half an inch clear bore, rather more preferable.

Washing the Gas.—A large proportion of the gas made is never properly purified, and the consequence is a rapid destruction of bags and taps by no means necessary. If a tap shows any perceptible corrosion—much less green rust about it—the gas is used when foul with chlorine. The same if the gas has *any* pungent odour, from which even fairly pure oxygen is perfectly free. There is much popular error on this point. 1. Water alone will not purify gas; 2. One bottle will not do it unless nearly a yard deep. As to the medium, many use either potassium carbonate or sodium carbonate (common washing soda), and either answer fairly well, but will not purify a very foul sample. I prefer to use *caustic* soda or potash, which will entirely remove the chlorine. Caustic soda is usually sold in sticks about five inches long: use a couple of sticks to a gallon jar. The same solution of this may be used three or four times over, which saves trouble. The oxygen should be passed *twice* through this, and may then be regarded as pure.

Common washing bottles with their screw caps are very troublesome. For years I used vulcanised indiarubber Woolf tops, with rubber nozzles through which the pipes were passed, stretched over the necks of the bottles. These are much better. But for a still better arrangement, combining the maximum of efficiency with the very minimum of trouble, I am recently indebted to Mr. Charles Darker, an ingenious artist—



for he is truly such in all optical matters—to whom we are all indebted for more than many are aware. His cap for washing bottles is shown in the figure. A is the delivery pipe of brass going down into the solution. This passes through and is soldered into the cap B, into the side of which is soldered the exit tube C. And over the cap B is stretched about two inches of thick indiarubber tube D. The whole is made so that the lower end of this stretches over the mouth of the usual size wine bottle. On a journey, therefore, these can be used, and no bottles need be taken, nothing but the caps and tubes. And whenever the rubber D loses its stretch, there is only this piece to renew; the rest is as good as ever. It is put on and removed in an instant, and the whole arrangement speaks for itself. Over-pressure will force it off the bottle, and to this danger it therefore acts as a safety valve.

One of your contributors, I think it was Mr. Scott, was, however, quite right last year as to the desirability of large wash bottles, and for home use it is better to use gallon size, which is easily got of the same sized necks. Use two of these, nearly full, and the gas will be pure. It will, however, be also moist, which is bad, too. To avoid this, use a *third* cap on a *narrow* bottle, empty or dry, such as a thin champagne or hoek bottle, or a piece of large glass tube. The moisture will collect in this and only dry gas go into the bag. The tubes should go nearly to the bottom of the wash bottles, and the

side holes not be bored very high up, or the gas will not have to rise through sufficient liquid.

All three bottles can easily be kept arranged on a little shelf if desired, but it is better to take off the caps after use that the rubber part may not lose its spring.

Of course, when the bag is full and the tap turned off, the tubing will also be detached instantly. The next step is to detach the tube from retort, as already insisted upon. Then turn the nozzle up the chimney till cooled down. It is best to wash out the same day, as the chloride residuum is rather destructive. Some remove it dry, breaking it up with a pointed rod, but it is much more trouble, and I think wears the retort more. When washed out, care must be taken to *dry* it out thoroughly, and do not forget to clear the delivery pipe and rubber tube of manganese dust, as already hinted.

The difference in wear of bags between gas thus properly purified and gas either delivered direct, or merely washed with water—it cannot be called purifying—is simply amazing.

LEWIS WRIGHT.

ON THINGS IN GENERAL.

“CAN photography lie?” What a terrible implied imputation! And I am indeed afraid that photography cannot be at all likened to Cæsar’s wife, for it is not above suspicion. When one finds a well-known photographer putting the above question (see report of the transactions of the London and Provincial Photographic Association) it is as good (or as bad) as a verdict of Guilty, at the outset. We are brought back to the old reply, “Truth is hid in a well,” and it is the real truth that such is the case in regard to matters photographic. I find it hard to believe Mr. Bridge’s friend who managed to secure £150 for services rendered to the two opponents in the case of a contested railway matter. But if this question itself be so horrifying, what will the British Public, or that large section of it that reads *THE BRITISH JOURNAL OF PHOTOGRAPHY*, think of the reply subsequently given at the Camera Club by Mr. J. Traill Taylor, “There was no room for doubting that *photographers*, as such, could and did?” Now, really, Mr. Taylor—I won’t say Mr. Editor, for he spoke as a photographer, and not an editor—what am I to understand? Do you mean to accuse me of mendacity because I happen to possess a camera and a lens? But no, that is impossible. I call to mind an old speech of the sort I heard a great many years ago. A printer had outraged the patience of one of his customers for so long a time that at last he got angry. “Well, I will give you my word the things shall be printed to-morrow,” said the printer. “Is it the word of a printer or the word of a gentleman you mean?” retorted the injured one. I will imagine Mr. Taylor to have spoken in a Pickwickian sense.

I was much amused at the remainder of the discussion that occurred the same evening in relation to the difficulty of pleasing sitters. I do not think any one not used to the work can have any idea of the great difficulties experienced by those who have to paint by the sun’s light. It is not necessary to believe that Mr. Henderson exaggerated the least when he speaks of one sitter—a gentleman—having employed himself for two or three hours before a looking-glass in arranging his position. I have myself seen an instance of a sitter of this class, who had taken about half an hour to pose, call out to the operator, just as the latter was going to uncap, “Now, how would this do?” throwing himself, at the word, into an entirely different attitude, and requiring all the arranging to be gone through again.

The great question of the hour seems to be orthochromatic or non-orthochromatic plates, and, clinging to its fringes is another, “lawsuit or no lawsuit?” There would be a great advantage to the community if only the question could be fought out for them; the combatants would have to pay all costs, and if, as is quite possible, the so-called “infringers of the patents” gained the day, then the process would be thrown open to the public at large. A patent suit, at the best, is nothing but weariness and vexation of spirit, and when it is mainly supported by, or combated upon, scientific, and especially chemical, evidence, the way the verdict will be brought in is a pure question of chance. This kind of evidence has been described by a well-known literary and scientific man as follows:—“Positive, men-

dacity; comparative, outrageous lying; superlative, scientific evidence." And I think he is not far wrong in his conclusions.

What is all the stir one sees happening at the meeting of an amateur society in a city well known for its connection with photography? A gentleman seems to have made a business of his amateur work some years ago, but the club or society condoned his offence; now they have reopened the question, and, by a resolution to the effect that "Any person now or at any time a member of this Association who shall practise photography professionally, sell, or publicly expose for sale photographs of his own production, shall thereupon cease to be an ordinary member of the Association," have, apparently, ostracised him. That is a resolution which with a prospective action only might be with advantage adopted by all amateur societies. Their ranks would be well thinned, for it is my belief that there are very few amateurs who do not sell their productions—professedly at a price, "just enough to cover the cost, you know," the cost, I suppose, of all their experiments, hire of instrument, and all etceteras, so as to make them free of all expense in the fixing of their hobby. I wish to observe, though, that in the resolution above quoted the word "shall" cannot grammatically (though I suppose the intention of the framers is not carried out in the words) be considered to apply to the past.

I note that at the last London and Provincial Photographic Association meeting some discussion upon platinotype printing took place, in which the speakers alluded to the difficulty of introducing modifications in the printing, as is commonly done with silver prints. Now there is no doubt that there is some increased care and judgment needed in the operation—it is scarcely one that can be deputed to "the boys;" but there is a fairly visible image in an undeveloped platinum print, and, personally, I may say I have found it a comparatively easy matter to introduce clouds into platinum prints. It is, however, requisite to take care that the time taken over the work be not prolonged too much, or the character of the results will suffer; for a very slight absorption of moisture by the paper renders it impossible to obtain purity of whites. By-the-by, I should like to know whether the pages of this JOURNAL are going to be permanently increased for the next year or two, to allow of more lengthened correspondence upon the "permanent" question? Can any one doubt that the readers will be pleased if such be the case, all the letters, so far, having been such nice, light, instructive reading? (I hope no one will think that by light I mean frivolous; for all frivolling is discountenanced from the editorial chair, I know.)

The articles upon retouching by Mr. Barrett that have been appearing for some months past in these columns, are written by a man who is at once artistic in feeling and capable of expressing himself in suitable words; but I should like to say of them that—assuming, as I do, from its last paragraph, that the paper printed at the end of December was the last of the series—there is a glaring deficiency in them. To the best of my recollection there is not one single word about the manner of using his tools. As to the calibre of the work to be done there is plenty of instruction, but as to the mystery of spot, dot, stipple, lines curved and straight, hatching or cross-hatching, not one word. Now it may be that Mr. Barrett intends to introduce some such instructions at the end of his work—that I cannot say, but one might fairly expect the series of articles to have begun with something of the sort.

At the close of exhibitions, photographic or otherwise, there are always, and as a matter of course, letters denunciatory of management, selection, and all other authorities, published in all the periodicals that will admit the lucubrations of the disappointed ones; but this time the cry has swelled to such a chorus of unbroken complaint as to breakages and damages that there is clearly some one at fault. A scapegoat will have to be found, for it is evident the gilt has all been rubbed off the frames. Some gentlemen have even not had all their pictures hung—would it be believed! May I make a suggestion to the authorities to have a supplementary exhibition of the works of the forsaken ones? I think one such exhibition should entirely for the future put an end to such wailing, for as the hangers were so regardless of the best interests of some of the senders as to hang a few of the atrocities, it is easy to imagine the character of what remained in the cellars, rotting I was about to say, but I am afraid there is no such kind fate in store.

In the report of the Manchester Amateur Photographic Society's

meeting last month, I read that "a novelty in the lantern display was the use by Mr. Jones of gas compressed into steel bottles instead of gas bags." Now I happen to know, as also do many of my readers, that there are some exceedingly wide-awake men in that Society, and I don't think they would look upon the compressed gas as a novelty.

FREE LANCE.

PHOTO-MICROGRAPHY.

[Abstract of Paper read before the Photographic Society of Philadelphia.]

ANY stand, monocular or binocular, the body of which can be inclined to a horizontal position, may be employed. In using a binocular stand it is merely necessary to withdraw the prism sufficiently to allow all the light to pass up the straight tube, and thus convert the instrument into a monocular. The eye-piece may be removed or not as the operator desires, the former plan being the one generally adopted and producing, so far as my own experience goes, the better results. If the eye-piece is not used, the tube must be lined with some non-reflecting material, as before stated. A mechanical stage is a great convenience and time saver in centering an object upon the ground-glass, but is by no means a necessity; it should, however, revolve in the optical axis of the instrument if possible. A double or triple nose-piece carrying as many object glasses of different foci is also very desirable, especially when high powers are to be used, as an object can be quickly brought into its proper position in the field of view under a low power, when by revolving the nose-piece a higher one takes its place, and if the two are properly centred, the object will be found to occupy the same position in the new field of view.

The placing of the object on the stage of the microscope, and arranging it in such a position as to cast its illuminated image upon the centre of the ground-glass focussing screen, are all to be done with camera closed up short, in which position the eye can readily see the image, whilst the hands reach the milled heads controlling the stage and focussing adjustments. But when the bellows are extended a foot or more this becomes impossible, and resort to some other method of varying the focus is necessary. The plan I adopted at first, and have ever since followed, was the old but effective one of a strong, fine cord placed in a groove turned in the periphery of the milled head controlling the fine adjustment of the microscope, and passing through hook eyes on either side of the camera to its rear, where it is held taut by a couple of small leaden weights. A very slight pull on either of these serves to change the focus in the most delicate manner, and this can be done whilst the eye is fixed upon the image on the ground-glass.

I have used the term *ground-glass* in connection with the fine focussing adjustment, but merely as a figure of speech. In reality ground-glass cannot be used for this purpose at all, as the very finest that could possibly be made is entirely too coarse to define sharply any delicate microscopic object. Its usefulness is confined to securing a full and even illumination of the field, and the arranging of the object in its proper position therein. These two essentials arrived at we must abandon the ground surface in favour of something better adapted to giving a sharply defined image of the magnified object. Many plans for effecting this have been published, but I shall at present notice only the two which I have used most successfully for some years. The first, which is useful for hurried work, consists in attaching to the centre of the ground surface of the focussing screen, by means of Canada balsam, a disc of thin microscopic covering glass about an inch in diameter. The balsam fills up the minute inequalities in the surface of the glass made by the grinding process, and renders the circle perfectly transparent. Now, if a Ramsden positive eye-piece, or any ordinary focussing glass adjusted to the thickness of the screen, be applied to the outer side thereof, the illuminated image will be seen clearly defined in this transparent circle with the most beautiful distinctness, when the proper focus is made with the adjusting cord.

This method, however, only allows that portion of the object which is in the centre of the field to be seen and focussed upon, whereas it is frequently desirable to go all over the same to arrive at the best average adjustment. For this purpose I use the following plan, which is so perfect in its results that I can conceive of nothing better: A sensitised gelatine plate, evenly coated, is exposed to a flash of light, and placed in the developing bath a short time, until it becomes somewhat discoloured, or clouded over, but not long enough for it to acquire any destiny. It is then washed and fixed as usual; after fixing and a prolonged washing, it is bleached with bichloride of mercury as for intensification, and again washed and dried, when it will be found to possess the finest surface for delicate focussing imagin-

able. And now comes in the use for the single plate holder, to which I have before referred.

Slide and back both being removed, the holder is reduced to a mere framework, which is placed in position on the camera, the ground-glass screen having been lowered out of the way. The bleached gelatine plate is now placed in the holder (film side toward the image), where it occupies exactly the place that will subsequently be filled by the sensitised plate. The positive eye-piece, or focussing glass, being now placed against the outer surface of the plate, and the eye applied thereto, perfect definition may be effected by means of the focussing cords, the proper position of the image upon the plate having been previously secured through the medium of the ground-glass.

A few words as to the objectives may not be amiss. For powers including one-quarter of an inch and higher, no special corrections are necessary. I have had most excellent results with the higher powers of very many of the best makers, both American and foreign, and even the cheap French triplet quarters have produced very good work without further correction. But for all lower powers a special correction, to render the actinic and visual rays coincident, becomes necessary for perfect work.

The proper illumination of the object is of the first importance, since, if we fail in this, all our other efforts are of but little account. Various sources of light are at our command. The direct rays of the sun, diffused daylight, the electric light in various forms, magnesium ribbon, or the oxyhydrogen jet, can all be used most successfully by those able to command time and apparatus. But my remarks at this time being intended mainly for the benefit of those who have only their evenings at their disposal, I shall confine myself solely to the consideration of that illuminator procurable by every one—a good lamp burning coal oil. Any form capable of being placed at a proper height to suit the stage of the microscope may be used, though some are undoubtedly better than others. The one I have adopted, and find eminently useful, consists of a broad, flat reservoir, with large capacity, carried at any desired height upon an ordinary retort stand, and using a duplex burner, with the flames placed at an angle to the plane of the stage, in order to avoid the dark spot in centre of field which always results if the flames present their edges to the object slide. The stage of the microscope should be provided with a set of diaphragms of various sizes, the arranging of the object being done with a large opening, whilst the exposure is made with the smallest which will properly and evenly illuminate the field of view. If desired, a condenser can be used to concentrate the light upon the object; but for a long time I have entirely discarded its use with all powers lower than one-fifth of an inch, using the direct rays proceeding from the lamp alone. This gives a more evenly lighted field, and although the length of exposure is somewhat increased, the resulting negative is better in every way than one made in a shorter time by a strongly concentrated light.

The difference in fact is very marked, and I would urge upon every one using lamplight to dispense with all condensers with moderate and low powers. With high powers, however, a condenser becomes necessary, and an achromatic combination of wide aperture, or one of the Abbé form, may be used with the best results. Some operators use blue or ground-glass for toning and diffusing the light. In short, the subject of illumination is an exhaustless one, and I shall not attempt to pursue it further at present. Neither can I give any certain rules as to time of exposures. The length of these vary greatly with the nature and structure of the subject, so that every one must learn to determine this for himself, as in ordinary photographic work. Using a given objective, and with the same plates and illumination, I have had exposures vary from ten seconds to five minutes, regulated entirely by the difference in the colour and structure of the subject to be photographed.

For all delicate structures, especially finely marked diatoms, I find it much better to develop for detail only, resorting to after intensification to obtain necessary density. By this means none of the finer lines or markings are obscured by too heavy a deposit, whilst the negative is quite as permanent as those not intensified, if it be first bleached in a solution of bichloride of mercury, and blackened by immersion in cyanide of silver, or a ten per cent. solution of sulphite of soda. Ferrous oxalate or pyro development may be used with equally good results. At first I favoured the former, but of late years have, in common with most others, grown more and more accustomed to pyro, which, with carbonate of soda, has given me results uniform in their success, and of a quality leaving little or nothing to be desired. I use no restrainer excepting the sulphite of soda in solution with the pyro, the resulting negatives being uniformly of a pleasant grey tone, entirely free from the yellow stains so often associated with the use of pyrogallic acid.

For making prints, bromide paper is especially recommended. It can be used in the camera for enlarging or reducing, or be printed by contact, by day or lamp light, as desired. It renders all delicate details better than albumen, the finished prints need not be mounted, for book illustrations they are perfect, whilst, finally, I think there can be no reasonable doubt of their absolute permanence. If a glossy surface is desired, it may be obtained by squeegeeing the print upon a sheet of polished hard rubber, from which it will peel off with a glazed surface when dry, as seen in the specimens now submitted.

Since the making of transparencies from microscopic negatives differs in no wise from those of other subjects, I shall not detain you in alluding to them further than to repeat that reduction in the camera gives more satisfactory results than contact printing, and that this is the plan I almost invariably pursue, even if the negative be upon a quarter-sized plate.

It adds very greatly to the scientific value of a photograph of any microscopic object, if the exact magnification be measured and stated thereon. To do this separately with each exposure would entail an expenditure of time and labour that few would care to assume, but if each objective be carefully measured with the camera closed, and also opened to the full extent of the bellows, and notes thereof preserved, it will be an easy matter to calculate the exact amplification used with each exposure. This measurement is very easily made. A stage micrometer ruled in one-hundredths and one-thousandths of an inch is placed upon the stage of the microscope, and the image thereof focussed upon the ground-glass, where the value of each division is readily determined. I would advise every one turning his attention to this branch of photography to make such a series of measurements at the outset.

As previously stated, any microscope with a joint for inclination of the body to a horizontal position may be employed in photography, but those having a short tube of large diameter will do better work than those with long ones. It is highly desirable that the rays of light, after passing through the objective, should be allowed to diverge as speedily as possible. Where they are confined to the limits of a long tube of small diameter, it will be found that only a small circle of light will be thrown on the ground-glass when the camera is closed up short, and that it must be lengthened to a considerable extent before the entire plate is illuminated. In order to overcome this objection, I devised, some years since, a stand from which the compound body may be entirely removed, and replaced by a cone-shaped tube which flares away from the back of the object glass, allowing the image-bearing rays to diverge at once after leaving the lens.

W. H. WALMSLEY.

PHOTOGRAPHING WITH PHOSPHORESCENT SUBSTANCES.

At a meeting of the Franklin Institute, Mr. Frederick Ives read a preliminary communication on this subject, giving the result of some investigations which he had undertaken at the suggestion of Dr. Wahl.

After making a photograph of a street scene by exposing in the camera for thirty seconds a tablet coated with Balmain paint, and then placing it in contact with a photographic sensitive plate for about the same length of time, Mr. Ives made exposures on the lime-light spectrum, to determine to what kind of light the tablet was sensitive. He found that phosphorescence was produced only by exposure to the violet rays, and that the light given out by the excited tablet was chiefly the indigo blue, to which photographic sensitive plates are more sensitive than to any other colour. But he also observed that a tablet exposed to sunlight, and then given a rest of several hours in total darkness, in a cool place, became quite sensitive to the dark heat rays at the opposite end of the spectrum, which caused a temporary exaltation and corresponding rapid exhaustion of the feeble phosphorescence remaining in the tablet. He succeeded in obtaining strong photographic negatives showing this action, and concluded that by this means it would be possible to obtain camera photographs of perfectly dark objects which radiated or reflected sufficient heat, provided that the lenses used were capable of freely transmitting such dark heat rays.

M. Ch. Zenger, in a recent communication to the French Academy of Sciences, asserted that he had obtained a photograph of towers and other objects at midnight on a dark night by the aid of a phosphorescent tablet, and attributed the result to the action of dark "actinic" radiations, which he supposed that the objects gave out at night. Mr. Ives pointed out that, as the tablet proved to be insensitive to such rays, Zenger's explanation was certainly incorrect. Mr. Ives's investigation had proved that bodies intensely heated by exposure to

the sun during a hot summer day might, under certain conditions, be photographed at night by the action of heat which they radiated; but the method did not seem sensitive enough to give such results with glass lenses, and he thinks Zenger's photograph may have been due to unsuspected feeble phosphorescence remaining from a previous exposure in daylight, several hours or even a day or two before.

Mr. Ives offered explanations of other phenomena observed by M. Zenger, and concluded by claiming to be the first to discover that photographs of dark objects may be made in the camera by the action of heat which they radiate or reflect.

ON CAMERAS AND FIELD APPARATUS.

[Abstract of Paper read before the Camera Club.]

THE type of the new form is the camera, now well known, brought out about two years ago by McKellen. I think I shall not be far wrong if I say that this type of camera claims to obtain rigidity, not by additional bulk or weight of material, but by an improved disposition of the parts on mechanical principles.

The question arises how far the advantages of the new form are real, and whether, if real, they are obtained by the sacrifice of the good points to be found in the older cameras? This involves the determination of the points necessary to a perfect or ideal camera, on which I will venture to give you my views to-night, with the object, I would add, of eliciting, rather than imparting, information.

1. The first essential of a camera, I take it, is that it should be as light as is compatible with rigidity; not, as some makers seem inclined to read it, as rigid as is compatible with lightness. As far as I have tested them, the new form, with folding fronts and backs, in "triangular positions" (to adopt an inaccurate but sufficiently understood phrase), are as rigid as the old, when not too fully racked out. When, however, they are used at their greatest extension they seem to me hardly as rigid as the older forms.

2. Both vertical and side swings are necessary in a perfect camera. The latter is not found in some of the new types, the makers conceiving that they get the same result by swinging the front, which is a delusion. In most of the new cameras the vertical swing starts from the hinge of the back, and not, as in the old forms, from the central line of the ground-glass. Every time the swing back is used on a new type of camera, the focus has to be readjusted. This is a distinct disadvantage of the new forms, as at present made. It is only fair to say, however, that the defect is not inherent, and might be remedied with ease. In fact, I have seen some new cameras, to which the old form of swing was adapted in addition to the new.

3. It is important that the lens should be capable of motion, both lateral and vertical. A much greater lateral motion than is usually given, even in the old camera, is necessary if two pictures are to be taken on one plate. In the new types the matter of lateral motion does not seem to have been sufficiently considered, though the vertical rise and fall is all that could be desired.

4. One requisite—not yet, I believe, supplied by any camera—is some means of taking smaller sizes of pictures without recourse to the clumsy expedient of carriers. It might be easily done by an extension of the principle of the sliding board commonly used for stereoscopic pictures. This board would carry grooves for the smaller-sized double backs, and would block out all the back, except the opening in the centre to receive the small slides. By this means the necessity for a second focussing screen is obviated.

5. A fifth point of great importance is that there should be some means of arranging the camera, so as to give both vertical and horizontal pictures. The old way of turning the camera over and re-screwing it was about as bad a way as was ever devised. Independently of the trouble involved, the camera was never sufficiently rigid in the second position—it was balanced, so to speak, on a knife's edge. The new way of making the camera square with a reversing back is convenient, but adds bulk and weight.

6. Most new cameras are now made with a great extension of focus. I am not of opinion that this is very necessary for field work. The use of a long-focus extension is mainly for copying and for portraiture. Both are operations that can be done at home by means of one of the "extension fronts" that are supplied by some makers, or by studio and copying cameras, if the amateur can afford to possess them.

7. An improved method of focussing is very desirable. The focussing cloth is an abomination, only tolerated because it covers the defects of our double back. Combined with the new arrangement should be a means of seeing the picture in its right position—that is, not upside down. A mirror hinged to a light frame capable of attachment to the back of the camera is what I would suggest.

When the picture has been satisfactorily composed, the apparatus would be removed, and the fine focussing performed by the ordinary focussing magnifier applied to the ground-glass.

8. In the ground-glass itself some improvement is desirable. The coarseness of the grain is very objectionable when magnified for focussing purposes. This is a great drawback where small pictures are taken for enlargements. Plain glass gives the most satisfactory image for the magnifier, but is not equally advantageous where the picture, as a whole, has to be judged of. Abney's "white wax, dissolved in ether and flowed over a plate," may make an excellent surface for studio work, but is hardly suited for the field.

9. A dark slide that will open inside the camera is a desideratum. Many such have been from time to time produced, but they all have the disadvantage of precluding the use of short-focus lenses. The double back supplied by Brandel, with his so-called "photo-revolver," seems to me excellent in conception, and I shall be glad to see makers adapting the principle to their cameras.

So much for the camera. As to stands, no great improvements have been made of late, if we except the turntable, which is, to my mind, a distinct advantage. The majority of stands take too long to set up.

A lens shade of some kind is, I think, a *sine quâ non* for field work. I know of nothing simpler than to use the focussing cloth, stiffened at the end by a piece of cane let into a seam to cover the lens instead of the ordinary cap, and be lifted to form a lens screen during exposure.

H. H. O'FARRELL.

THE PROGRESS AND DEVELOPMENT OF ORTHO-CHROMATIC PHOTOGRAPHY.

ONE of the greatest advantages in depicting objects by photographic methods is the truthfulness and accuracy with which they are rendered upon glass, paper, or other carriers of sensitive films. The remotest fibre and infinite structure of microscopic animals is reproduced by the camera with such exact sharpness, that student or investigator is enabled to project them in enormously enlarged proportions with equal exactitude. Architectural drawings and other designs are reproduced in correct angles, perfect copies of the original, and the human face is found upon the photographic plate not only as a true image but with all imperfections nature has given it. Every line, every elevation, is there equally sharp with hair or beard, and all is reproduced without mercy to the original. Considering these and similar points, photographs are indeed correct representations. In one respect, however, photographic pictures are almost devoid of veracity, that is, in the reproduction of colour values. When we examine photographic pictures, it is seen how very little truth there is actually in them in regard to colour. Scarlet and yellow, which appear bright to the eye, are represented in a sombre, dark tone, and blue or violet, no matter how dark in the original, are, in the picture, quite light, at times even white.

Light, divided into its spectrum rays and then projected upon a sensitive photographic film, will not act in proportion to its colour brightness, or as the eye is impressed, but in proportion to a certain force or power called actinism. The chief action will take place in the spectrum region from violet to blue; and those parts containing the bright colours, green, yellow, orange, and red, will scarcely be acted upon, showing that the visible effect on the eye is not at all a representation of the chemical or actinic force. The term photography is, therefore, not absolutely correct, for light in its entirety does not right, but a portion of it only, the chemically active or actinic rays.

With the rapid strides which photography has made in late years, a mode of operating has been discovered, which has not emanated from the brains of one single man, but which to accomplish all enthusiastic researchers in photo-chemistry and spectrum analysis have contributed. We have seen how the luminous light rays act upon photographic plates but to a limited degree, or not at all, and how others, appearing much darker, show excessive force. Pigment colours in action correspond very nearly to those of the spectrum, although the latter are preferable for experiments, or the determination of the action of a certain ray. The more refrangible rays, violet and blue, are actinic, that is, photographically active, while the luminous rays, red, yellow, &c., have but little photographic action. The end in view was to use these latter rays in photographing as well as the former.

The elder Dr. Draper experimented on the action of spectrum colours as early as 1850, and came to the conclusion that only those rays become active upon sensitive bodies which are absorbed by them. Extensive studies in spectrum analysis led to various experiments, and the propounding of various doctrines. Ducos du Hauron and Cros

interposed coloured glass screens between objective and sensitive plate to intercept certain rays, and to control or to depress their force. A yellow screen depresses the action of blue, and red that of green.

The first yellow coloured plates came from England, but they had no practical value, although they gave an impetus to more direct investigations and experiments on the absorptive power of coloured films. If plates are coloured with a yellow or orange dye, blue and violet rays will be intercepted, and the force of their action reduced. Green will act similarly on red rays, and red on green. The first attempts of scientific value were based directly upon the results of spectroscopic researches, and two colours, coralline and aurine, were employed to counteract the violent force of violet and blue. Not less objectionable were those of yellow and red.

At the occasion of the sun's eclipse in 1873, a meeting occurred between a German investigator and Captain Waterhouse, of Calcutta, who was then induced to resume and continue his experiments, in consequence of which a newly discovered dye, the eosine, was proposed for colouring plates.

In the meantime American scientists had not been idle; the eminent Carey Lea made the subject a part of his studies; Frederick C. Ives employing the green chlorophyl for the depression of red, and Edward Bierstadt, in many directions experimented in orthochromacy.

In 1881, Clayton and Atout Tailfer, Frenchmen, patented and published a method (isochromatic they called it), with which the desired effects could be obtained to a very high degree. They added eosine to the emulsion of bromide of silver and gelatine, and gave a still greater susceptibility by adding small quantities of ammonia. The process was enthusiastically received, for with these eosine plates and the use of a yellow screen blue and yellow were reproduced nearly correct, although the other rays did not respond so well. Highly interesting experiments with important results then followed rapidly, and some of the most renowned scientists resumed photo-spectrographic studies, and directed their attention to the action of the less refrangible rays, yellow, orange, and red.

The important labours of Victor Schumann, Dr. Eder, Charles Scolik, and Captain Abney led to the most marvellous results in orthochromatic photography, and among Americans we find Ives and Bierstadt again at the front, the former directing his attention to the action of chlorophyl in combination with eosine and other dyes.

Now we are able to copy the sun spectrum and nearly all pigment colours upon the sensitive plate. Of more than two hundred dyes experimented with, only a few have been retained for their efficient actions; eosines in various shades, blue and red chinoline, some of the anilines, and of vegetable substances, chlorophyl and turmeric. The mode of applying these colours to the sensitised film has been greatly simplified, and the photographer is now enabled to prepare a colour-sensitive plate for immediate use.

Ordinary gelatine dry plates, preferably those which carry in the emulsion but a very small amount of iodide of silver, are subjected to an extremely diluted bath of ammonia to give them susceptibility for the dye, and are afterwards subjected to the action of erythrosine—a dye belonging to the eosine series—and also in very diluted solution. The preparation of a plate requires not more than four or five minutes, and no other precautions are required than to work in nearly total darkness and to subject the plate to the colouring bath but for a limited time. Too much colour will reduce the general sensitiveness. In contradiction to the term isochromatic, the method is now called orthochromatic, meaning to reproduce colours correctly as to their brightness, while isochromatic implies uniformity of colours. A better and more descriptive word would probably be the plain English colour-sensitive.

The practical value which orthochromacy offers to scientific pursuits cannot be over-estimated, when we consider that objects formerly quite inaccessible to the power of a sensitive plate can be successfully photographed now. Prof. Pickering, of Boston, and the Brothers Henry, of Paris, have obtained pictures of the optically invisible nebulae of the Pleiades, and Prof. Huggins has made a photograph of the corona of the sun when not eclipsed, while Spitaler, of Vienna, has made pictures of the moon with a telescope corrected for optical rays only. Microscopic objects are in frequent cases copied with the aid of chinolines and erythrosine, and spectrum analysis finds in colour-sensitive plates an indispensable aid. The professional photographer who reproduces with them oil paintings and other works of art, is enabled to make copies of fabrics or embroideries, no matter how greatly non-actinic colours may be prevailing. The retoucher's work in portraiture will, in a measure, be dispensed with, for light yellow or brown freckles do not show on an orthochromatic negative, and light auburn or gold coloured hair will photograph light, not black as heretofore.

With the extreme sensitiveness of erythrosine plates for yellow, orange, and red rays, artificial light has been pressed into the service of the photographer. Incandescent electric light, the gas flame, and even the ordinary petroleum lamp, give good light to photograph on colour-sensitive plates.

While great credit is due to German scientists for having done the pioneering in spectrum photography and orthochromacy, Americans have not remained inactive, and they have contributed much to make the methods of photographing upon colour-sensitive plates practical for the daily use of professional and amateur photographers.

—*Photographic Times.*

CHARLES EHMANN.

ACCESSORIES OF THE LANTERN.

CHAPTER I.—GAS BAGS.

EVERY lantern operator knows what an important part of his outfit the gas bags are. Supposing he is using the mixed gas jets he requires two bags, and the cost of these accessories will be nearly as much as the price of the biennial, especially if the latter is a cheaply made instrument. The gas bags are not only expensive as regards their first cost, but they also form the largest item in the cost of maintenance. The lantern with its fittings and the slides may keep in good order during years of constant use, and cost little or nothing in repairs, but the gas bags, more especially those used for oxygen, deteriorate so rapidly that the work of a single winter season often wears them out completely. The life of a gas bag in constant use being so short, any means by which it can be lengthened will naturally be of interest to those whose purses are affected by the matter.

The material of which gas bags are made is rendered air-proof by one or two films of indiarubber, by which the cloth or twill, which is used in two or three thicknesses, is cemented together. Upon the substance of this indiarubber depends the longevity of the gas bag. In the best bags the rubber is over a sixteenth of an inch thick, and of course resists the corrosive action of the gases for a much longer time than cheaper bags made air-tight by a mere skin of rubber.

When a gas bag begins to leak it is not so much the cloth which is defective as the layer of rubber attached to it, which has become rotten. Hence it is real economy to purchase a first-class gas bag in preference to a cheaper one of the same size; the extra cost will be amply compensated by increased durability.

All new bags should be thoroughly tested, to ascertain if there is any leakage. This may be done by filling the gas bag with air or coal gas, and placing it between the pressure boards with a half-hundredweight thereon. If the top board only sinks one or two inches during a period of twelve hours the bag may be considered sound; if the bag is only half full at the end of that time it is still serviceable, as the leakage during the two hours of an exhibition would not be very serious, still, such a loss should by no means be tolerated in a new bag. Sometimes the leakage is caused by the plug of the tap not being screwed up tight enough, or from not being properly greased with tallow. If the leakage is not connected with the tap the bag should be returned to the vendor, with a request for a sound bag to be given in exchange.

As gas bags are used for both oxygen and coal gas, and as it is extremely dangerous for these gases to be mixed together in one bag, it is necessary to use each bag constantly for the same gas. As a general rule, a bag used for oxygen should never on any account be filled with coal gas and *vice versa*; the bag which is used for coal gas should be a complete stranger to oxygen. The non-observance of this rule is the cause of perhaps one-half of the explosions that occur in connection with lantern work. It is a good plan to paint in large white letters "O" on each side of the oxygen bag, and "H" on the sides of the coal gas or hydrogen bag.

It will usually be found in the case of two similar bags devoted respectively to oxygen and hydrogen that the one used for oxygen will be quite worn out and unserviceable through leakage before the other bag shows any deterioration whatever. Hence it is obvious that oxygen has a greater corrosive action on the indiarubber than coal gas. This destructiveness is said to be due to the chlorine gas which is evolved from the chemicals in the retort in company with the oxygen, and careful operators hence add powdered chalk, lime, or potash to the water contained in the "cooler," with the view of absorbing this obnoxious chlorine. I believe that the water which is carried over from the cooler into the gas bag, when the gas is generating very fast and the liquid in the purifier is in furious commotion, helps the bag to decay. The water once in the bag cannot evaporate, and it keeps the interior surface permanently damp. It is a good plan when making oxygen to have the bag on a table, and the cooler on the

floor. Any drops of water that may be forced from the cooler into the rubber tube by the pressure of gas will then flow back into the vessel when the current of gas becomes weaker.

Temperature has a great influence upon the durability of gas bags. I once had a large new bag of good quality rendered unserviceable through corrosion in *six weeks*. This occurred in the heat of summer, and the bag contained oxygen. A similar bag containing coal gas was found at the end of that period. Hence gas bags are rarely used in hot countries, such as India, as the expense of maintenance is so great. During frosty weather the bags do not deteriorate at all, or else they do so very slowly indeed. If the question arises as to whether any surplus oxygen that may be left after an exhibition is to be used or not the temperature should be taken into account. If the weather is frosty, keep the gas by all means; if it is warm, it will be better policy to empty the gas bag. It is a good rule to put bags containing oxygen in the coolest place available.

When the limelight first came into use it was customary to put both the oxygen and the hydrogen into one bag. This method certainly had the advantage of simplicity, as no adjusting of the jet taps was required; but the explosions that occurred induced those in charge, out of consideration for their personal safety, to adopt the system of separate bags for each gas. It is possible to work a mixed gas jet with one bag containing the two gases without rendering the services of the coroner necessary, the points to be observed being the use of a small aperture in the jet nozzle, and plenty of pressure on the gas bag; however, such a system is more dangerous than the use of ether tanks, which, as most lanternists are aware, are quite capable of being blown up.

I know a gentleman who some years ago gave a lantern exhibition to a crowded audience; he was using the mixed gas jets, and had his two bags of oxygen and coal gas in the pressure boards as usual. When half of the slides had been shown he was startled to find, after adjusting the two taps of a jet, that he had turned one completely off and the light was still burning brilliantly! It was plain, owing to some mistake made in the filling of his gas bags, that one of them contained a highly explosive compound. He was thus on the horns of a dilemma; either he must proceed with the exhibition at the risk of the lives of those near the apparatus, or else an awkward and undignified "five minutes' interval" must be put into the exhibition. He chose the latter, and quickly turned the gas off at the jet; the audience sat in a state of surprise and total darkness for a few minutes, but, after a while, a change of bags was effected, and the exhibition was continued.

If any one who reads this article should find himself in a similar predicament, I would advise him to adopt the same plan—unless he is alone, and has his life heavily insured, in which case prudence is, perhaps, not so essential.

ALBERT WM. SCOTT.

LANDSCAPE PHOTOGRAPHY.

[A Communication to the Aberdeen and North of Scotland Amateur Photographic Association.]

My aim in the short paper I am about to read will be to lay before you a few things in connection with landscape photography. This refers to photography as practised outside a studio, and I purpose dealing only with it from the practical side, so that while I refer to it as I have observed it practised by many amateurs, gentlemen present will kindly bear in mind I do so from the point occupied by one interested in securing the best arrangement of subject under the most suitable light and conditions essential to success.

That photography has a charm for many is evident from the great number of cameras I come across in my wanderings, the owners thereof firing off snap shots on every conceivable subject, and under what appears to me as a rule—unfavourable conditions. Yet there is a certain amount of pleasure even in this, though only the ghost of a picture is developed, as better things can be hoped for the next opportunity. However, I have seen many exquisite pictures by amateur gentlemen who practice photography purely for pleasure, indeed, very much superior to the work of some professionals; but I don't think you'll find they go in for trying everything instantaneously. I am often approached in a knowing sort of way, "Ah! working the instantaneous process, I suppose?" and great surprise is expressed when I answer in the negative; but since the use of dry plates became general, the one idea of many appears to me to do all subjects instantaneously. The results are disappointing, even when good subjects are attempted, in a hazy, dull day; how much more when done as I saw during the last summer at Rothesay pier. A gentleman, one fine afternoon, from the deck of the "Columba," directed his camera towards the sun in his endeavours to secure a view of the town. Everything was in deep shadow, while the strong sunlight appeared

to intensify the smoke that hung over the many chimneys. I refer to this as one instance out of many I could bring up of the indefinite ideas that exist as to what constitutes a favourable light for securing a good picture. Had the camera, in this case, been directed in nearly an opposite direction, something good might have been got of Rothesay Bay, with the Cowal Hills in the distance, while a lugsail boat or a passing steamer could have been utilised to break up the expanse of water.

Then the attempt to overtake something beyond the capacity of either camera or lens, such as a tall steeple. With his back to a wall and the camera turned up to nearly the angle of forty-five, I have seen a gentleman vainly hoping to make a picture; add to this the fact that the sun was directly at his back, which gave the steeple without a trace of shadow on it.

Then, again, some run after animals, and wonder why their instantaneous plates develop almost clear glass, and express surprise they cannot turn out something worth a medal, since some other body does very fine studies of animals.

In connection with the laudable desire to do something good, an incident comes to my mind. While working in St. Andrew's, a gentleman approached me one day and asked if I could direct him to any good subjects in the district. I replied to the effect that I thought he was in the midst of a great variety of very good subjects, adding there is the cathedral, the castle, houses ancient and modern, while there is the ever-changing sea, with rocks, waves, boats, and indeed better material than could be found in many places. He shook his head, and said that was not the sort of thing he wanted; but pulling from his pocket a book treating on composition pictures, added, "It's something of this sort I want." Rather advanced for a beginner, I thought; however, I remarked, "There is plenty of scope for your hobby all round. There is life of every sort, industry and indolence among all classes, from the aristocrat golfing on the links, to fisher folks busily baiting their lines or lounging at the street corners, with their hands plunged into the unfathomable depths of their pockets—this, with creels, boats, lines, and heaps of mussels, is surely variety enough; but your difficulty will be to secure the good-will of your subjects, which is most important." Whether or not he made up his mind to attempt this I cannot say, but I found him dodging about after me as if he had got new light on some of the subjects he did not think worth attempting before.

However, there are one or two elements of character I consider indispensable to success in photography. I pass very lightly over the fact that any one who is enthusiastic will know the advantage of early rising; many a good view is got when a large proportion of the inhabitants are snoring in bed. Patience, with perseverance, is said to work wonders, and there will be many opportunities for carrying these into practice, if you would make the best of every subject.

When doing work about a town, smoke is very troublesome, and often entails a weary wait. Then a fine reflection may often be secured by exercising a little patience and watching for a brief lull, not to speak of the advantage of quietness when foliage breaks up the foreground.

Then in order to secure the best light, it is often a great advantage to wait until the sun moves round a little, or, more correctly, "the earth moves round." Of course there are many occasions when it is manifestly useless to wait for the calm moment, and in such a case it is wise to look for a subject unaffected by wind. But in any case be deliberate in choosing a point, and, when decided on, be deliberate in fixing up the camera and exposing, or you may find yourself uncapping your lens before the plate is uncovered; or some fine day you'll be exposing the same plate twice, and find out perhaps after all that if a little more care had been exercised a much more effective point, and that in a far better light, could have been secured.

This brings us to the importance of method in working, and in this connection it will be wise to run over the necessary apparatus, with which it is well to be on very familiar terms. This will prevent us going into the country some day minus the camera screw, or perhaps the tripod top, without which we would miserably fail. Have a place for everything, and run over in your mind the operation of fixing up the camera for work, and exposing a plate, in order to satisfy yourself that nothing is wanting.

This will bring us to speak of apparatus, of which there is great variety to select from. Not the least important is the stand, as many a good view is lost through a rickety stand. Most of the stands of the folding pattern have this fault, on account of having only a single limb from the joint downward. I have with me an improved folding stand you may inspect. A spirit-level is another necessary in getting correct pictures where straight lines come in.

The camera and slide I'll suppose you have very carefully inspected, lest any stray light may come in and the unfortunate plate maker be

blamed for sending you bad plates, while the fault lies with the camera not being sufficiently light-tight. Inspect every movement, such as sliding front, with the lens screwed on and capped. Throw up or remove the focussing screen, and, with the camera placed in bright sunshine, look through as if about to focus, with the cloth carefully adjusted so as to keep out all light from behind, and you may, by turning round the camera, discover some little blink you never dreamt of. However, it is always well to work with the cloth carefully adjusted, so as to screen the camera and lens as much as possible. A swing back is also a very useful arrangement, but requires to be very carefully adjusted.

"What lens do you use?" is a question very frequently asked of me. Well, any good lens will do, providing you don't attempt too much with it. Confine your lens to covering a plate the diagonal measurement of which is equivalent to its focal length, excepting when you have a lens especially made to cover a larger plate, such as a wide-angle rectilinear. A single lens is good for general landscapes, but many of the single lenses that are going are of a small diameter, and consequently slow. However, for many subjects, this is no objection, but there is satisfaction in having a good lens. A rapid rectilinear is doubly useful.

Now supposing the slides have been carefully inspected, dusted, and charged with plates, you will think about trying something. Although it is quite possible to go through the whole operation mechanically, since the dealers send out printed instructions of the plates being so sensitive, you can expose, bring home, and with so much out of bottle No. 1, and so much out of No. 2, you develop so many minutes, and everything is bound to come out right. Well, perhaps they may, and no doubt this accounts for some—when first attempting photography—producing one or two wonderful plates; but how they got them is a mystery to themselves, for they say we cannot do the same now.

We will begin by not attempting anything very great. A friend's house is always a handy subject, and houses being all pretty much alike we will consider how we can set it off, for we will not be satisfied with planting our camera right in front of it, and filling the plate with the front or front and gable walls. Are there any trees about? as, if possible, we must get them introduced, so as to make the picture. Of course it is well, in most cases, to get sunshine, particularly if the building is dark, of which, by the way, there are not many about Aberdeen. But with the most important part of the house in sunshine, and just enough shadow to give relief, we notice if the trees are still before exposing, which must be done deliberately and sufficiently long to get details in all the shadows without solarising the high lights.

Suppose we go to the country a bit, and try a different style of subject. It is well to remember, in this connection, what constitutes a photographic picture. It is not colour, but light and shade; and subjects that appear to many as effective pictures are of no use for photographing. We want form, and that must be effectively lighted. For general landscapes we want a clear day with bright sunshine.

The selecting of a good plate is important. The rules applicable in fixing a good point for sketching hold good in photography, not forgetting that colour is nowhere. Though in sketching anything we fancy may be introduced, in photography we must adapt ourselves to things as they exist, or very nearly so. Look at a good engraving or a good photograph, and while making up your mind not to copy the photograph, you may be sure you cannot exactly reproduce the engraving, but there is something to be learnt from both, and turned to good account the first opportunity for selecting a point. If there are distant hills in the landscape, they will probably show up best if the sun does not shine on them when exposing, though by all means have sunshine on the foreground and the middle distance, and avoid having very large objects in the foreground, or the distant hill will look too diminutive. Be always ready to take advantage of water, trees, rocks, loose branches, tree roots, or anything at hand to break up a smooth foreground.

If a waterfall is the subject chosen, or if the nature of the day warrants this—for all arrangements in photography are subject to the weather, a quiet sunless day will suit, and in many cases will be found preferably to a day of brilliant sunshine, as in deep gullies and shady glens bright sunshine shows such heavy black shadows that, in order to expose them sufficiently, the high lights are all solarised, but with a quiet, even a hazy day, we can get every leaf, every twig and fern, if sufficient exposure be given.

On such a day as this, some of the beautiful weeping birches on Deeside may be got; haze in the distance will help to make the tree stand out, if you cannot show it with water in the background: so you see there are great varieties of subjects in a day's outing, and if the weather prove unsuitable for one, we may fall back on another.

The beauty of cloud effects, when taken in connection with water, I feel confident is appreciated by all who possess a camera, and, being near the sea, there is abundant opportunity of securing something in this way. For this we must have a cloudy day, but not too many clouds, and, with the sun ahead of us, we can watch for the effective moment and expose quickly. Avoid having the sun blazing immediately in front, though a ray striking the water in the distance enlivens the picture wonderfully.

When photographing on a street or on a road, there is often the objectionable accompaniment of a great stretch of white foreground. The shadow of a tree helps in a case of this kind, if we can secure it; failing this, the shadow of a building. A few buckets of water, judiciously spilt, will often work wonders. But the greatest difficulty in street views is mobs of people who want to be "took." A few coppers may dislodge youngsters, but it is not an easy matter and often very tantalising, when a favourable opportunity occurs, to get some grocer's or butcher's boy, with a white garment of some sort and a big basket, stand up some twenty or thirty feet from the camera, when you know by experience that, however short the exposure may be, he'll keep moving. Patience may weary out a few, and this, with a little tact, may overcome the difficulty.

Cattle may be got on a sunless day even better than on a day of brilliant sunlight, and that with a very short exposure.

Portraiture may also receive a share of attention, and it is possible to turn out good pictures without a specially built studio. The great objection to portraits taken out-of-doors is they are flat. Now this may be got over to a great extent by adopting the course I am about to suggest. Avoid setting down your subject back to the wall and facing an expanse of open sky, as this shows the face without a trace of shadow. Reverse the order of things, and set your subject a few yards outside, say the back-door, in a diffused light. If you have no special background, the wall of some outhouse will serve this purpose, and its distance will ensure its being soft. Keep the camera a few feet inside the door, just in the passage. Of course, when making this arrangement, you must necessarily discern when you have got sufficient shadow; a slight movement either to the right or the left, or a little farther from or nearer the doorway, makes a great difference, and with care a fine round picture can be secured in this way.

"But what exposure do you give?" is so often asked that I suppose I must say something about it, though to fix anything definite is misleading, as no two subjects are exactly alike, and the same subject would require longer or shorter exposure at different hours of the day. An improperly lighted subject will not show up well, whatever care you bestow on it, and one with heavy, dark shadows in the immediate foreground, and the distance flatly lighted with brilliant sunshine, need not be attempted, as if you expose the foreground enough the distance is lost, or get the distance right and the foreground is clear glass. Take such without sun altogether, if you cannot get the light and shade sufficiently distributed. Also avoid exposing when the sun is at the point that leaves you without any shadow, and avoid exposing when the sun is so far ahead of you that everything is in shadow excepting the house-roofs and the level road. As exposure plays a very important part in the production of a good print, it is well that this should be sufficiently long to bring out all details in the shadows, and ought to be so timed as to allow of development being carried out without either forcing or restraining. An under-exposed plate is waste, excepting in so far as you learn to expose more correctly the next time. A full exposure—that is, an exposure that admits of a considerably smaller proportion of ammonia being used than the plate can bear—will allow you greater control, and this is a feature I believe very much overlooked in dry-plate photography. It is so much out of this bottle and so much out of that, and develop so long—well, you may as well put them into a churn and turn a handle. Just see how hard some pictures turn out, and a nice soft thing might have been got had the development been regulated by a former subject. Then be careful to develop until all details are out, which, in many subjects, means that you don't make up your developing solution of the strength that would show your high lights as dense as a board by the time the details in the shadows come out. Many a good picture is hopelessly spoiled in development, while many an over-exposed plate may be saved with care and patience.

Those who are familiar with the working of the collodion process must have noticed there is a difference between a collodion and a gelatine negative, to such an extent as I believe may never yet have been fully taken into account. For instance, a gelatine plate that looks like a good old collodion plate is almost useless for ordinary printing, whereas a gelatine plate, that, judging by a collodion plate, would be useless, prints amazingly well, and leads many to be satisfied with, I think, too thin negatives.

I have always developed with ammonia and pyro, and find a full exposure gives the best picture, using as little bromide as possible. After fixing I prefer immersing the plate in a solution of protosulphate of iron and citric acid, as, in my estimation, it removes yellowness better than anything else, so after washing thoroughly and drying, you will have time to spot and prepare for printing, in connection with which I see Mr. Sang is expected by-and-by to clear away all the difficulties, and make this process easy and delightful to yourselves and your friends, who will look upon the productions of your camera many days hence.

ALEX. M. RIDDLE.

PEELING OF PRINTS.

UNDER the heading of "Answers to Correspondents" which appeared on New Year's Eve, "H. M." brings under notice an experience in practice which is not by any means singular at this season of the year, as doubtless many of the readers of this JOURNAL can testify.

The earliest recollection the writer has of the difficulty alluded to being forcibly impressed upon him, occurred during a brief sojourn among the Redskins of the great North West, as far back as the memorable freeze-up of 1868, and in a region where half the year is usually accredited with very low temperatures. Here it became necessary to melt ice before print washing operations could be commenced, and it was by no means unusual to find photographs, which were under this somewhat crude system of being freed from deleterious agents, fixed securely in a solid block of ice when looked at on the following morning. With extreme care, and a prolonged application of heat, a proportion of the number could be saved from total destruction of the kind suggested by your correspondent; but these, which were decidedly in the minority, showed unmistakable evidence of unfair usage. Coming to recent events, it may be mentioned that a short time ago complaints of a similar character were rife in Aberdeen, Glasgow, and other places in the North, whereby many hundreds of prints became damaged and totally unfit for sale, from no other cause than that induced by the lowness of temperature then prevailing. Some of these specimens were shown at a meeting of the Photographic Society of Great Britain, but as the majority of the members present evidently had not been in the habit of carrying on the pursuit of silver printing under difficulties, they were unable to arrive at a satisfactory solution of the enigma. Possibly another reason which militated against the real cause being discovered on that occasion was the circumstance that the examples were for the most part 8 x 5 photographs of, in all other respects, an exceptionally high character, the initials thereon being a sufficient guarantee that no ordinary preventable causes would be permitted to step in to mar the attainment of perfection in photographic presentments of nature.

Sufficient evidence has now been adduced to prove a case for your correspondent "H. M." Now let us for a moment consider how these pernicious effects may be easily produced, and the remedy will at once become suggestive.

Like "H. M.," a good many other photographers sensitise their *double albumenised paper on a sixty-grain solution* of silver nitrate, and leave the prints resulting therefrom in some vessel of water all night for the purpose of washing, and so far there does not appear to be any real objection to such a method of treatment; but "H. M." has not yet stated to what extent he has contributed to the failure by the use of hot solutions in toning, &c., thereby imparting a more than ordinary degree of softness to the size which his double albumenised paper contains. If the bonds of adhesiveness, which are intended to retain two surfaces in tolerably perfect contact, become loosened mechanically, or by any other means, then it is not difficult to imagine that the whole, or part of the surface of any print may detach from its former support when other and stronger forces become exerted to bring about such a result.

A layer of water, no matter how thin it be, in contracting to form a fine surface of ice, is a force capable of doing all that has been complained of by "H. M.," and others, when the conditions are most favourable. We know that a print, when removed from a vessel of water to an atmosphere in which the temperature does not exceed 32° Fahr., will of necessity very soon support a layer of ice upon each of its surfaces, and if permitted to remelt and dry in a warmer position, without being handled, might turn out all right; but place one print in contact with another when in a semi-frozen state, blot such prints or use physical force in any way, and the ice crystallised within the cells containing the silver image, as well as in the porous paper, will, without further ado, proceed to exert its influence in detaching the brilliant or more highly polished surface from that which underlies it, always, of course, leaving a vigorous image

beneath, provided the operation of sensitising has been sufficiently prolonged to ensure the silver solution having penetrated into the body of the paper situated beyond the albumen coating. For whether the sizing used in the manufacture of the photographic paper be of the nature of starch or gelatine, we know it to be capable of becoming sensitive to light when silver chloride is formed therein, with or without an excess of silver nitrate, and in such a condition it is possible to obtain an image by the aid of daylight in all respects as forcible as we are in the habit of getting with single or double albumenised paper brought under the influence of similar conditions.

ESQUIMAUX.

THE USE OF THE HYDROMETER IN PHOTOGRAPHY.

IN every process of manufacturing that involves the making of solutions of salts of known strength, or where it is necessary to mix and dilute solutions to a given value, the hydrometer is the most useful instrument to place in the hands of the operator. This is pre-eminently the case in chemical manufacturing, as well as in pharmacy and the compounding of alcoholic beverages; and it has often been a problem with us why the photographer does not use the hydrometer to assist him in mixing his developers and other solutions. Perhaps the neglect to use such a useful instrument may be put down to the fact that few photographers stop to think of its merits. As a simple statement of the principles upon which the hydrometer is constructed and works, and a few indications of its manner of use, may prove interesting, we have thought it worth while to call the attention of our readers to the subject.

The hydrometer consists of a glass tube with two bulbs near one end, the lower one being loaded with shot or mercury. It is so constructed that when placed in water it will float in a perpendicular position, which essential function is secured by the shot or mercury in the lower bulb. The principle upon which it acts, in determining the specific gravity or comparative weight of a liquid referred to water, is one which was discovered by the Greek philosopher, Archimedes, that a solid body placed in any liquid will sink in that liquid until it has displaced its own weight of the liquid. The hydrometer, therefore, must be of such a form that it will float in water; and how it will float, that is, how much of the stem will rise out of the water, will depend upon the purposes for which it is desired to use it. According to the principle of Archimedes, a heavy liquid will cause the hydrometer to float higher than a light one. It is, therefore, necessary in this case to make it float in water as deep as is convenient to handle it, and to mark the tube at the point where it stands under these circumstances. When such an instrument is placed in a liquid heavier than water, more of the tube will float above the fluid than when it is placed in water. In the case of liquids lighter than water (alcohol, ether, &c.), an instrument graduated as above stated would be useless, for the reason that it would be too heavy; it could not displace its own weight of the liquid, and therefore it would sink. In this latter case the tube must be so weighted that as much of it will stand out of water as will secure a vertical position for it, and the place where it so stands in water is marked, as in the case of the instrument for heavy liquids. From the position of this water-level mark it is obvious that when this last hydrometer is placed in a liquid lighter than water it will sink lower in that liquid. These statements may appear very elementary to many of our readers; but we are pretty sure that a great many of them have never given the subject a thought, and have failed to realise the value of one of the most useful pieces of apparatus that can be placed in their hands.

We have stated above how the zero point, the level at which the hydrometer stands in water, is determined, from the use that is to be made of the instrument. The next step is the nature and meaning of the divisions on the tube, and here an arbitrary method of marking is as good as any other, provided the value of the divisions are known. Of all the hydrometers ever invented, that devised by Beaume, a French apothecary, is the most popular and the simplest to use. The method he adopted for determining the divisions on the scale was to place the hydrometer into a solution of common salt containing fifteen parts of salt and eighty-five parts of water; and the position on the tube where the instrument floated in the solution he marked 15. The tube between this point and the zero mark he divided into fifteen equal parts, and continued the division below the 15 mark in exactly the same manner. These divisions are called degrees Beaume, and while they do not exactly represent what Beaume sought to establish, percentages of salt in the solution mentioned, they serve as an arbitrary scale to use for any purpose where a hydrometer can be utilised.

All the Beaume hydrometers now made are constructed upon the principles we have indicated above, and if we know their value for any given solution we can determine in an instant the specific gravity of that solution, and also the quantity of valuable material in it.

Photographers have already in their hands a hydrometer—the actinohydrometer—for determining the value of their silver baths; but this instrument is devoted to a special purpose, and our idea is that the hydrometer shall be used for all classes of photographic solutions where their value should be known by the operator. Take, for example, the mixing of the ferrous-oxalate developer. We are told to use a saturated

solution of the iron salt and a saturated solution of oxalate; but who knows that the solutions are saturated unless special precautions are taken to secure such a result? With a Beaume hydrometer this can be determined in an instant, from the fact that a saturated solution of ferrous sulphate stands at 27 degrees Beaume, and a saturated solution of potassium oxalate at 30 degrees. Hyposulphite of soda solution is saturated when the Beaume hydrometer stands at 40 degrees, and perfectly definite figures can be found for each salt used by the photographer. Furthermore, solutions having a definite strength, say, one to four, or such figures, can also be most readily determined by the use of the hydrometer. One word of caution only is necessary; that is, all solutions should be at ordinary temperatures, 60 to 65 degrees F., the instruments being graduated for this purpose only.

We have called attention to the use of the hydrometer that photographers may have a means of knowing more thoroughly what they are doing with their solutions. We are well aware there are many objections to the use of the Beaume scale, but to-day it is in use in every large chemical works on the Continent of Europe and in the United States, and as it is to be found in the market of considerable accuracy, we consider it the best and most useful instrument for the purposes we have indicated. Should our readers think it of sufficient interest, we shall publish, in the future, tables giving the degree Beaume for solutions of the more ordinary salts used in photography.

—Anthony's Bulletin.

STELLAR PHOTOGRAPHY.

PHOTOGRAPHY has of late years become so completely the handmaid of Science, that we cannot be surprised at any of its most recent developments. The microscopist is no longer dependent on the pencil of the draughtsman for accurate representations of the objects under his lens, and the passing eclipse is secured for future study by the photographer who has become so important an assistant on that critical occasion. The astronomer sweeps the heavens with aids at his command which the Herschels never dreamt of possessing; and Dr. Huggins only lately secured a plate of the sun's corona under circumstances which bid fair to render a natural eclipse no longer necessary for the student of solar physics. A close examination of the moon's photographs have revealed hills and valleys and dismal craters which the observer did not at first note through the telescope, until, as Professor Newcomb lately declared, the surface of that planet is better mapped than many sections of the United States. But it has been left to M. Struve to confirm by means of actual observation a fact which, for several months, had rested on the authority of the photographic plate alone. In November last the Brothers Henry succeeded in obtaining a photograph of the Pleiades. In itself this was a sufficiently notable feat, for though Rutherford and other astronomers have succeeded in making photographic charts of the heavens—and one of the earliest applications of the art was by Warren de la Rue taking an exceedingly sharp impression of the same group—the plates hitherto obtained were faulty in many respects. But what was most remarkable in the Henry plate was not the actual picture of the "Six Sisters," but the fact that an object hitherto unnoticed by the thousands of eager eyes who had scrutinised the constellation appeared in it. This was not Sterope, the "invisible one," whom the ancients fabled to have hid herself in shame, because she alone had married a mortal, and who is supposed to have existed in the form of a seventh star, which has gradually disappeared. What met the astonished gaze of the photographers was a large spiral nebula, apparently proceeding from the star Maia. Twice again, at the interval of three weeks, the constellation was photographed, and with a like result, the nebula invariably reappearing of the same form and in the same position. On examining a plate taken at the Harvard Observatory ten days before the one referred to, this identical nebula was noticed, but, in spite of the exertion of the Paris astronomers, assisted by their largest instruments, no sign of the nebula revealed by the lens could be detected. But M. Struve, of Pultova, having got his gigantic telescope into position, is at last able to report that he has actually seen what hitherto had to be taken on the credit of the photographic plates on which the Pleiades told their own story.

The interest of this revelation is twofold. It proves, in the first place, what a wealth of worlds still lies for the explorer of the heavens to discover, in spite of the vigils of all the watchers, from Job to Janssen. Scarcely a year elapses during which some new planetoid is not announced, and comets are so frequently coming into view that ignorant folk, who do not appreciate the scientific importance of these wanderers in space, are beginning to grow blasé with the news. Not long ago a new star appeared in the nebula of Andromeda, and now a fresh cluster of unknown and, for the time being, undetermined luminariae is revealed in the Pleiades. Several views of this region have already been figured. But it is strange that, with all the study devoted to the famous cluster, it has been left for the photographic camera to tell what the most powerful telescopes had, up to the date of M. Struve's confirmation of the Henry photograph, failed to reveal. Yet each of the shining specks that make up the fleeculent curl, which looks like a curdling fluid, is most probably a little star, imperceptible to the naked eye, simply because the rays of light proceeding from each of them are so blended with those from the stars in their close proximity, through the influence of irradiation, as to produce an effect

which can only be compared to a luminous mass. What is the exact nature of the new nebula is less important than the fact that it exists. Many nebulae are variable. The large irregular nebula which surrounds the star *Eta Argus* has been thought to be of this nature, and the great nebula in Orion is under a similar auspicion regarding its constancy of form. Others have vanished since the period when they were first noticed, while, on the other hand, there are nebulae which have appeared in places where no nebulousity had been noticed, though the space had been carefully scanned by observers who could scarcely have missed it. It is just possible that the new one may be of that nature, though the chances are against it. But what is of even greater interest is the circumstance under which it has been discovered. Now that photography is proved to be invaluable, not only as a recorder but as an observer, the field which it opens up seems boundless. A star millions of miles away takes its own portrait, though no human eye, aided or unaided, has been able to see it. The spectroscopist has enabled us to analyse the constituents of the sun and the other celestial bodies; and it is every day becoming more and more likely that before many years elapse we shall know almost as much about the chemistry of the fixed stars as we do at present regarding the envelopes of the sun, and its glowing atmosphere.

When photography first began to aid astronomy, the art was hampered by difficulties which no longer exist. Modern dry plates, which are not only cleanly but rapid, have obviated many of the mechanical obstacles which the old processes put in the way of the observer, so that the physicist has an entirely new tool at his disposal. Dr. Draper photographed the moon just forty-six years ago. But the first stellar photographs ever taken were those of *Alpha Lyrae* by the elder Bond, at the Harvard Observatory, in 1850. In 1857 his son carried similar investigations much further. At first, however, as the Brothers Pickering showed, in a paper read before a recent meeting of the American Academy of Sciences, they were unable to obtain clear images of stars of the second magnitude, while now it is possible to print those of the fourteenth. In other words, we can, owing mainly to the improvements in dry plates, transfer to paper an image produced by objects only a hundred-thousandth part as bright as formerly. By employing a new instrument, in which a photographic lens of eight inches aperture and forty-four inches focus is mounted equatorially and moved by clockwork, photographs of several different regions may be taken upon the same plate, and the stars distinguished by varying the exposures. By these means a new map of the sky may be secured, showing the position of the stars at any given moment, and thus securing for the astronomers of coming generations a record the importance of which it is impossible to exaggerate. Indeed, the only limit to the further extension of stellar photography is the sensitiveness of the dry plate, and as this limit is plainly not yet reached, Professor Pickering, of Harvard, who is actively engaged in these researches, is confident that even better results may be expected. All this is very different from the day when Warren de la Rue was essaying the portraiture of the Pleiades, or—by the aid of an equatorial mechanism for keeping the image of the moving planet for several minutes in the centre of the field of view of the telescope which moved along with it—succeeded in photographing Jupiter with his parallel zones. He even fixed on the collodion the rough surface of the planet Mars, and the wondrous image of the "belted ball" of Saturn. The moon is now almost as well photographed as a popular actress, and, it may be added, with a great deal more accuracy, for there is no "touching up" the negatives of Luna. However, as the pioneers in this field of research could not beg the moon "not to move, please," it was necessary for the telescope, at the focus in which the image was to be fixed, to move at exactly the same rate as the object photographed, so that mechanical accuracy was hard to obtain. These difficulties are now all but historical. The almost instantaneous gelatine plate, more sensitive than the retina, has made the astronomer's task no longer so hard, while such results as those just obtained impart to his pursuit all the excitement of a scientific lottery.

—Standard.

Department for Inexperienced Photographers.

EMULSION PHOTOGRAPHY.

ASSUMING the reader of this class of articles to be quite unacquainted with photography, we open the series by an elementary explanation concerning emulsion photography.

The sensitive material in a plate is usually bromide, chloride, or iodide of silver embedded in some suitable vehicle, such as collodion, albumen, or gelatine. Albumen was the medium in which it was at first formed, and the sensitive film was prepared by mixing with it a small proportion of iodide of potassium or of ammonium, which was then spread upon glass and allowed to dry. The plate thus coated was immersed in a solution of nitrate of silver, by which the silver combined with the iodine, forming iodide of silver throughout the interstices of the film, the potassium or ammonium combining with the nitric acid thus liberated and forming nitrate of potash, which, being soluble in water, was thus lost sight of. Not so, however, the iodide of silver,

which, being of a light yellow colour, and insoluble in water, remained in the film, to which it imparts a creamy appearance.

Seeing that plates prepared in the manner just outlined were used while wet, especially when collodion formed the vehicle in which the insoluble silver salt was formed, this method of working was known as the wet collodion process. But if the iodide (or other insoluble salt) of silver be the real energetic material which forms the photograph, why, it may be said, not make up a quantity by itself, and then stir it up among the liquid that is to serve as a vehicle? This was done many years ago, and from its thus forming an emulsion arose the term *emulsion photography*. A photographic emulsion therefore is nothing more or less than a solution of albumen, gelatine, or collodion, containing, mixed up with it, the sensitive salts (which are none the less salts because they are amorphous opaque matter) of which the image is eventually composed, after having been submitted to the action of light. The terms "collodion emulsion" or "gelatine emulsion" merely indicate the vehicle, and a gelatine or collodion emulsion plate is one coated with an emulsion formed of one or the other vehicle.

When a bromide of silver alone is emulsified in the manner indicated, then is it termed a *gelatino-bromide* or *collodio-bromide* plate or process, and so forth with chloride and iodide. But as chlorine, bromine, and iodine are known in chemistry as halogens, they are not unfrequently spoken of in this connection as the *haloid salts of silver*.

Sensitive emulsion may be applied to paper (for being printed on in the usual way) as well as to glass. There are two systems of emulsion for paper; one in which the surface darkens directly under the light, the other requiring the aid of a developing solution. Paper coated according to the requirements of both these systems are now commercial productions and may be readily obtained everywhere. As a vehicle in which to emulsify the sensitive salt, collodion possesses a great advantage over gelatine, inasmuch as it is always ready for use; and from the great rapidity with which the film sets, it can be employed for the extemporaneous preparation of plates which will be ready for use almost immediately afterwards, or which, if allowed time to dry, will keep good for a long period. But gelatine in turn possesses an advantage over collodion on account of the greater hardness of the film and the superior sensitiveness. For the photographer whose aim is merely to produce a few plates now and again by artificial light in the evenings, the collodion emulsion, being always ready for use, will afford exceptional advantages.

RECENT PATENTS.

PATENTS COMPLETED.

A NEW OR IMPROVED POCKET PHOTOGRAPHIC CAMERA.

No. 8654. EDWIN MARTIN KNIGHT, 148, Cheapside, London, and GEORGE HENRY KNIGHT, 11, Bernard-street, Russell-square, London.—*July 1, 1886.* This invention relates to a new or improved camera for photographing, specially designed for portability and storage in the pocket, and consists of a combination of sensitive plate and a pin-hole lens. The latter is closed or sealed from the light before and after use, together with a containing and folding camera, the whole being so designed as to fold flat or letter-like in form, is produced at very small cost, and is specially designed for storage in the pocket.

According to this our said invention, we construct the sides, top and bottom, or "bellows" of the camera, of paper, glazed calico, or other cheap light and readily folded material, the front being preferably of cardboard, and in the centre of which is a hole, behind which hole and on the back of the cardboard forming the front of the camera is a pin-hole lens, the hole and lens being closed or covered by an adhesive wafer or cover, which can be readily removed. The rear end of the bellows is so cut and folded as to form a holding receptacle for the sensitive plate. The method of use is as follows:—The pin-hole lens being closed by the adhesive cover or wafer, and the sensitive plate placed in position, the whole can be pressed flat and placed in the pocket until required; whereon the bellows will be extended and the cover removed from the pin-hole lens, and as soon as exposed a sufficient time the adhesive cover or wafer will be applied over the lens hole, and the whole be pressed flat and returned to the pocket for after "development" at leisure. It will be understood that a number of the improved apparatus may be compressed into the space of a few inches.

The claim is:—The folding and expanding camera constructed as above described, and in combination with a pin-hole lens and sensitive plate, as above described, and illustrated by annexed drawings.

AMATEUR PHOTOGRAPHIC ASSOCIATION OF VICTORIA.—The following list was received too late for the ALMANAC:—*President*: J. H. Browning, M.D.—*Vice-Presidents*: J. McEwan and E. C. Bell.—*Hon. Secretary*: J. H. Harvey.—*Hon. Treasurer*: J. J. Fenton.—*Hon. Librarian*: E. A. Walker.—*Hon. Custodian*: E. W. Purton.—*Committee*: E. J. Hughes, J. Lang, J. Mulvany, F. A. Kernot. Meets at Royal Society's Hall, Melbourne, on the second Tuesday in each month. Amateurs from all parts of the world made welcome, and any visiting Victoria are invited to communicate with the Hon. Secretary at the above address.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 11	Great Britain	5A, Pall Mall East.
" 11	Newcastle-on-Tyne & N. Counties	Coll. of Physical Science, Newcastle.
" 11	Manchester Amateur	Masonic Hall, Cooper-st., Manchstr.
" 11	Bolton Club	The Studio, Chancery-lane, Bolton.
" 12	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 13	Birkenhead	Free Public Library, Hamilton-st.
" 13	Bradford Amateur	Grammar School.
" 13	Cheltenham	4, Clarence-street.
" 13	Halifax Photographic Club	Mechanics' Hall.
" 13	Manchester Photo. Society	36, George-street.
" 13	London and Provincial	Mason's Hall, Basinghall-street.
" 14	Yorkshire College	
" 14	Ireland	Royal College of Science, Dublin.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

On Thursday night, December 30, at the usual weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. W. H. Prestwich presided.

Mr. J. B. B. WELLINGTON exhibited some carbon pictures upon opal, as examples of a class of photographic work suitable for presents at this season.

Mr. A. Cowan exhibited some sensitometer prints, indicating that gas flames charged with "albo-carbon" had four times more actinic power than without it.

The question was asked what was the best way to render paper largely impervious to alcoholic liquids.

Mr. A. HADDON suggested first treating the paper with gelatine and chrome alum.

Mr. J. TRAILL TAYLOR asked why coagulated albumen would not do. Mr. WELLINGTON had tried soaking plates in chloride of sodium after exposure and before development, as recommended by French operators; in every case, and with whatever developer he used, it slowed the plate, as tested by the sensitometer, and did not give a better image.

The question was asked what was the best mountant to prevent cockling.

Mr. A. L. HENDERSON responded that indiarubber was the best. Mr. TAYLOR said that the indiarubber became worthless in a few years. An alcoholic solution of glue or gelatine with a minimum of water was good.

Mr. HENDERSON had obtained as good results with ordinary plates as with the orthochromatic plates in the market.

Mr. W. M. ASHMAN said that the two kinds of plates had been publicly tested by the South London Photographic Society in the hall of the Society of Arts, and Dixon & Gray's orthochromatic plates gave by artificial light the same results in six seconds that ordinary plates gave in two minutes.

Mr. TAYLOR referred to a letter by Mr. Wellington published in these pages, and asked what was the position in relation to the patent for the use of eosine in orthochromatic plates.

The CHAIRMAN thought that to be a question for the law courts.

Mr. HENDERSON handed to the Curator some ready-sensitised paper to be kept in his custody, and to be returned to the Association after the lapse of one month; he said that it was advertised to keep for nine months, and had just been sent to him.

Mr. F. A. BRIDGE had taken home one of the packets of paper given to that Association some months ago, and spoken about at a recent meeting by Mr. Henderson; he (the speaker) opened his packet two or three days ago, and found slight but evenly distributed discolouration, as in the specimens he now produced before them. He had executed some prints upon the paper, and they could see they were fairly good, although not such as he would like to send out to the public. Altogether he thought Mr. Henderson's recent remarks about the paper to be hardly fair to the maker.

Mr. HENDERSON responded that on the occasion mentioned he had stated that he had not kept the sheets in their wrapper of paraffined paper. There was nothing to equal freshly-sensitised paper.

Mr. W. ENGLAND exhibited a cheap German instrument for testing milk, somewhat resembling a circular photometer in appearance, and which, he said, might perhaps be of photographic use.

Mr. TAYLOR said that it had been suggested to him that on ready-sensitised paper a thin film of sulphide of silver might gradually form, and that this accounted for perversity in toning.

Mr. A. HADDON stated that paper prepared upon an unsophisticated bath would after a time refuse to tone, and a neutral bath would tend to favour the formation of sulphide of silver; this would not be the case were the sensitising bath acid.

Mr. TAYLOR said that prepared paper treated with tartaric acid at the back would retain its whiteness for an indefinite period. He had some prepared with citric acid by Mr. J. R. Johnson at the time of the first establishment of the Autotype Company's works at Brixton, which paper he believed to be good yet. When he last opened the packet recently, when in America, the paper was all right and gave a good print.

The meeting then resolved itself into a committee for routine business purposes.

THE ROYAL INSTITUTION.

PROFESSOR DEWAR is now delivering a course of six lectures at the Royal Institution on *The Chemistry of Light and Photography*, and by last Tuesday he had reached the fourth of the series. Brilliant experimental illustrations are given, but as yet he has brought forward little which would be novel to the readers of these pages. His first, second, and third lectures were devoted to the phenomena of light. In one of them he exhibited a metallic mirror with a pattern which he had filed upon its back; it reflected light in the ordinary

way from its front surface, but when he slightly bent the mirror forwards or backwards the image upon its back appeared light or dark upon the screen; it was, in fact, an imitation of the magic mirror of the Japanese used in their religious services. In his first photographic experiment he placed his hand with extended fingers upon a sheet of glass covered with Balmain's luminous paint, and printed an image of his hand by means of a beam from the electric lamp; a black image of his hand then became visible upon a luminous background when the plate was exhibited in the dark. Last Tuesday he said that Wedgwood was the founder of modern photography, and first made known his results at a meeting of the Royal Institution in 1802. Professor Dewar here repeated Wedgwood's early experiment of taking a photograph upon white leather. He next took photographs by Nièpce's bitumen process and by the Daguerreotype process. For these very slow processes he was obliged to use a most powerful electric arc light; the carbons were about an inch square.

The Comte and Comtesse de Paris and the Princess Helena were among those present at the lectures.

THE SOCIETY OF CHEMICAL INDUSTRY.

LAST Monday night, at a meeting of the above Society held at Burlington House, London, Mr. David Howard presided.

Mr. WATSON SMITH read a paper upon the new explosive, "Knetite," a plastic material made of nitrobenzene, chlorate of potash, pentasulphide of antimony, and gun-cotton. In one of his experiments he pointed out that gun-cotton would dissolve in nitrobenzene, and that after the latter had taken up five per cent. thereof the solution could be boiled without danger of explosion.

Mr. John Spiller and Mr. Arnold Spiller were among those present at the meeting.

CAMERA CLUB.

ON Thursday evening, December 30, a paper on *Cameras and Field Apparatus* was read by Mr. H. H. O'Farrell [see page 8]. Mr. FRANCIS COBB occupied the chair, and, in introducing the discussion on the lecture, remarked that the subject had been covered in the most complete and interesting manner. He thought the old square form of cameras with fixed fronts was still the best in small sizes. As regards camera stands, he feared they were being made much too light now. Dark slides, too, were not what they might be. He knew of one that had been recently invented, constructed of steel, which, if brought up to its promise, would be a perfect double back. There might be danger of engendering heat, but it was perfectly safe as regards light.

Several visitors were present at the meeting, including Messrs. Gotz, Shew, and Martin, who explained the special features of their well-known cameras.

Dr. LINDSAY JOHNSON referred to the method explained by the lecturer for doing away with inner carriers in large-sized cameras, and remarked that this plan was largely adopted by Mr. Frith.

Mr. FERREÑO thought that a long-focus camera was sometimes very necessary in the field, and useful for bringing into service the back combination of the rapid doublets. He exhibited a camera by Messrs. Sands & Hunter, in which the back was swung horizontally and vertically by rack-and-pinion movements.

Mr. E. COCKING, at the request of the Chairman, explained the construction and working of one of Brandel's photo-revolvers, which he had been kind enough to bring to the meeting.

Mr. GIFFORD pointed out that nothing had been said in regard to the fixing of the lens, and showed a simple means of securing the lens to the camera front, in which, instead of the usual screw, a bayonet catch was used and the lens put into position by a slight turn.

On Thursday evening, January 13, the subject for discussion will be *Negative Films*, when Surgeon-General Ranking will read a paper.

MANCHESTER PHOTOGRAPHIC SOCIETY.

LANTERN SECTION.

THE first popular meeting of the above Section was held in the large room in the Memorial Hall, Albert-square, December 22,—Mr. J. Schotfield in the chair.

Mr. Abel Heywood, jun., contributed the first portion of the exhibition, which consisted of upwards of sixty slides from photographs taken by him during a tour in Hardanger Fjord, Norway, last summer.

The members' summer work was next shown, and consisted of upwards of one hundred and fifty views.

A vote of thanks was duly passed to Mr. Heywood for his excellent entertainment, and the meeting terminated. There was a large attendance.

Correspondence.

Correspondents should never write on both sides of the paper.

CAMERA CLUB CONFERENCE.

To the EDITORS.

GENTLEMEN,—May I ask you to insert this letter calling attention to particulars in connection with the General Photographic Conference to be held under the auspices of the Camera Club on the 8th of February next?

By the courtesy of the Council of the Society of Arts the use of its hall in John-street, Adelphi, has been obtained for the meeting.

Captain Abney will preside, and will also read a paper. Other papers are expected, contributed by Messrs. W. Adecock, W. K. Burton, A. Pringle, and J. Traill Taylor.—I am, yours, &c.,

Camera Club, 21, Bedford-street, W.C., G. DAVISON, Hon. Sec.
January 4, 1887.

BURNLEY PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—The Burnley and District Amateur Photographic Society has decided to hold its Second Annual Exhibition of Photographs, open to the public, on January 27, 28, and 29. Last year we had a very successful exhibition, being crowded the whole time it was open, but we were rather short of exhibits. I now desire, through your columns, to appeal to my brothers in the art, amateur and professional, to kindly help us by sending a few of their works for exhibition. There are no prizes or competitions in any form. If any lady or gentleman who is willing so generously to help us would kindly send her and his name and address to me, I should be pleased to send further particulars.

The greatest care will be taken of exhibits, and special attention will be paid to repacking, and the cost of transit defrayed by the Society.—I am, yours, &c.,

WILLIAM STUTCLIFFE, Hon Sec.

7, Bank Hall-terrace, Burnley.

THE PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—There is one paragraph in Mr. Bankart's letter in your issue of Friday, December 31, which may puzzle many. He writes:—"We see by the Catalogue that some of the more important business firms had from ten to twenty-one frames each exhibited, nine firms amongst them had one hundred and fourteen frames."

Possibly others have also been curious upon the matter, and have done what I have, namely, gone backwards and forwards through the Catalogue, the result being that I cannot total up the amount to the number of frames stated, whilst keeping in view the two factors in the sum, namely, the nine firms and the ten to twenty-one frames each.

I then tried the index, and with a glow of satisfaction began to think I had nearly unravelled the puzzle, as I there found a quantity of figures after certain names, but upon comparing the Catalogue with the index I discovered that I had been reckoning the apparatus numbers as frames, and so I got utterly lost, and gave up the search.—I am, yours, &c.,

OUTSIDE THE NINE.

ISOCHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Your correspondents, Mr. W. H. Hyslop and Mr. Wellington, having called attention to the undoubted fact of Colonel Waterhouse being the first discoverer of the use of eosine as a colour sensitizer in photography, you will, perhaps, allow us to explain that in the Tailfer & Clayton patent, dated January 8, 1883, the above fact is specially mentioned, the claim being for the application of eosine and its compounds to the gelatino-bromide process as distinct from the collodion process.

The novelty of this application is admitted by all who are conversant with the facts, including Colonel Waterhouse himself, whose experiments were exclusively confined to the latter process. We are advised that the patent is a perfectly valid one. This, however, is a question which can only be definitely settled in the law courts.—We are, yours, &c.,

B. J. EDWARDS & Co.

6, 7, 8, 9, and 10, The Grove, Haekney, London.

To the EDITORS.

GENTLEMEN,—Referring to your remarks in reference to Mr. W. H. Hyslop's letter in your issue of the 24th ultimo, there can be no doubt that the application of a known material to a new process, especially by a new method, is an invention which may constitute a valid patent.—I am, yours, &c.,

PATENT AGENT.

Suffolk House, Laurence Pountney-hill, Cannon-street, London, E.C., January 4, 1887.

Exchange Column.

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

Will exchange 12x10 single mahogany dark slide for whole-plate wide-angle lens.—Address, A. KNIGHTEN, Oakham.

Wanted, a bottle bichromate battery and Leclanche cell in exchange for a one-inch micro-objective with case.—Address, L. DIXON, High-street, Colne.

I will exchange a first-class head-rest or hive of bees for a good revolving stereoscope or Lancaster's 12x10 view lens.—Address, W. SAUNDERS, Dickleburgh, Scole.

Marion's universal camera, whole-plate, with double back and extra front, with rectilinear lens, and cash, for large size tourist camera, good make, and lens; also ferrotype plates, envelopes, &c., for C.-D.-V. embossing frame, or, with cash, for half-plate folding camera with late improvements.—Address, BERLIN STUDIO, Old Kent-road, S.E.

I will exchange THE BRITISH JOURNAL OF PHOTOGRAPHY from 1865 to 1880 for Dallmeyer's No. 1A wide-angle rectilinear lens or a good copying camera.—Address, J. H. MANN, Sandale, Doncaster.

Wanted, *Cassell's Technical Educator*, new edition, for photographic tools, mahogany half-plate camera, and many things, all in good condition.—Address, S. ARLIDGE, Photographer, Weedon, Northamptonshire.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED:—

W. Kershaw, St. Anne's-on-Sea.—Three photographs of Lifeboats, &c.

J. H. T. Ellerbeck, Liverpool.—Landscape view in Norway.

R. W. Burlon, 45, St. George's-place, Canterbury.—Portrait of Gamekeepers, &c.

G. McKenzie, jun., Bridge of Weir.—Portrait of Mr. McJanel.

H. B. BERKELEY.—Received.

GEORGE E. WELLS (Franklin, N.Y.).—Not at present.

REV. GEORGE BLAIR (Ontario, Canada).—Your favour received. Thanks.

S. SMITH.—Write to Mr. W. Cobb, Woolwich, he may possibly supply your requirements.

A. B. C.—If you cannot otherwise recover the money your only remedy lies in the County Court.

J. WILSON.—We do not know the gentleman's address. Write to the Secretary of the Photographic Society of Great Britain.

J. S. B. S.—If you have anything new in optics to submit we shall be pleased to pass an opinion, whatever it may be worth.

ALBUMEN.—Moisture is doubtless the cause. If the prints be made as dry as they get in summer the surface will be as hard.

FIFTEEN-GUINEA SET.—The letter could not be published without your name being appended, which we think you would scarcely like.

A. W. J.—The paper having become damp and mildewed is now useless for albumenising. It will be a waste of time and material to use it.

J. A. W.—Rough drawing-paper suitable for coating with insoluble gelatine, for single transfer carbon printing, may be obtained from any artists' colourman. Whatman's or Hollingworth's answers quite well.

PAPER.—1. If the solution still contains any gold it will be advisable to add it to your other gold residues.—2. The lens in question is, no doubt, an old-fashioned single landscape lens. It will not be worth while to fit any other lens to it with a view to improvement.

B. S. inquires what is the best lens for taking instantaneous pictures three inches square with a pocket camera.—The best lens to employ is one of the "rapid" type of about four and a half inches focus. Such a lens will, or ought to, cover this size plate well with full aperture.

METALICUS.—Spence's "metal" is what is known as a sulphur sulphide. It is, or used to be, obtainable of Messrs. Spence & Co., 31, Lombard-street, E.C. The melting point is about 250° Fahr. It will be much more economical to purchase the metal than attempt to make it for yourself.

R. W. SIMMONS.—We have not retained the address; you can, however, overcome your difficulty in the same manner as we recommended our correspondent to overcome his, namely, to employ stronger solvents. Methylated solvents will do quite as well as any other for enamel collodion, provided they are of sufficient strength.

BEGINNER (Yorks.).—It is impossible to say where you have failed. If you send us one or two examples of your difficulty we can no doubt assist you. The process is really very simple when once understood. From the tone of your communication you appear to think the difficulties of working are very formidable. Such is not the case.

J. HICKS.—If you take the engraving to any picture restorer he will clean it for you for a small sum. Cleaning prints is not a really difficult operation. But, in the hands of one inexperienced, there is some little risk of injury to the original. "Plate paper," when wet, is far more difficult to handle than photographic paper; hence the risk.

C. A. M. W.—To reduce a negative on paper, place it in a weak solution of ferricyanide of potassium and hyposulphite of soda—say, three grains of the former to one ounce of a five per cent. solution of hypo, the solution being freshly prepared. Instead of developing each print separately, we advise you to do them in batches. We shall be glad to hear from you again.

F. G. S. says: "1. I am about to take a private house in a terrace (end one), and, as I am only a beginner, I do not like to build a studio to be a fixture, so thought of getting a portable studio, which, if I am not mistaken, can be removed after erection if requisite. Will you tell me how I must go to work?—2. There being six or more houses in the row, I am anxious to know whether the neighbours can in any way interfere with me in erecting a studio if I get permission to do so from the landlord. It will not overlook any one's premises except the gardens.—3. Can you inform me within a little the price of a good studio?"—1. If the studio is a portable one, and is not really attached to the ground or to any surrounding buildings, it can be removed at any time.—2. If you obtain the sanction of the landlord we presume the neighbours cannot interfere, provided the Local Board regulations are not infringed. Of course the next-door neighbour can erect any structure he chooses on his own ground so as to stop out your light, if he thinks fit, which is scarcely probable.—3. Better get an estimate from a local builder, or, if you wish for a second-hand studio, advertise for one.

ANTI-FAT.—If we understand the description rightly, the trouble does not proceed from grease in the gelatine. It may generally be overcome in the manipulation. Try the following method of coating:—Pour on to the plate about double the quantity of emulsion it is to retain, then dexterously shoot off the superfluous and quickly bring the plate to the horizontal position. Thanks for your friendly greetings.

J. J. writes: "1. I am thinking of getting a studio built, twenty feet long, ten feet wide, eight feet high; please tell me how much glass to put in and where to put it to get best results?—2. The studio will be near the road-side and people will be able to see in; will you tell me what to put on the glass, or should I use white muslin or what so as to get best results without making exposure much longer?—3. To use a whole-plate camera and quarter-plate lens will it take a longer exposure than using quarter-plate camera?"—In reply: 1. For that size studio four feet six at each end (roof and sides) opaque and the rest glass will answer very well.—2. The side next the road may be glazed with fluted glass. That will prevent passers-by seeing into the studio. Ground-glass will also answer the same purpose. Either plan will be better than muslin.—3. Certainly not.

BLUENOSE writes: "1. I have seen several references in THE BRITISH JOURNAL OF PHOTOGRAPHY to 'Willesden paper.' can you inform me if it is employed for building purposes, would it be suitable for covering a portable studio walls and roof, or roof only? I wish to build a portable studio for taking classes at colleges, &c., and want to make it as light as possible, and thought of making the roof at least of the paper, if suitable. Please advise me if it is suitable for such a purpose, and if very expensive. If suitable perhaps you could give me the address of parties interested, whom I might address for further particulars.—2. Can photo-crayons be made from scratched or spotted negatives? if so, how is the photo-crayon spotted, and with what materials? If you can give me any information on the above subjects I will be much obliged."—In reply: 1. Willesden paper is, we believe, not very extensively employed for permanent buildings; but it is very useful for purposes such as that of our correspondent. It may be had of different thicknesses, and it is not expensive. The address of the makers is Willesden Paper Works, Willesden, Middlesex.—2. In making photo-crayon pictures from scratched negatives the best plan is to touch out the scratches as neatly as possible in the negative, then what still shows in the picture may be repaired with water colour, as in ordinary spotting.

G. A. writes: "Please inform me what, in your opinion, is the cause of the camera being reflected in the enclosed print, under the following circumstances.—The parrot's cage was placed on a chair just outside the hall door, the hall behind being a particularly dark one, with no mirrors about. The lens used was 'rapid,' and the exposure two seconds. The day was bright, with no sun; snow was on the ground; the development showed that the plate had been properly exposed, and I am at my wits' end to account for the image of that confounded camera, the only explanation as yet offered being that it was jealous of the Poll. Is there any method by which the ghost of the camera could be erased, as the parrot is a pet in the house?"—The effect is very peculiar, but we cannot attribute it to a reflection of the camera. It rather appears as if the plate had received a prior exposure to some bright object. However, the remedy is what has now to be considered, or, rather, how to obtain prints free from the blemish. In the first place, the background and everything except the parrot and cage should be painted out in the negative, so that the background prints white; then, when the impression is printed, the parrot and cage are painted over on the print with gamboge, then a false background must be printed in. When the print is washed for toning the gamboge will be dissolved off, leaving the print intact. Thus a good picture of "Pretty Poll" may yet be obtained. It is by this method that Mr. Edge produced such marvellous results some years ago.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, January 12, 1887, will be *Photographing Snow Scenes*.

ANNUAL DINNERS.—Messrs. W. Watson & Sons, of 313, High Holborn, gave the annual dinner to their *employés* at the Holborn Restaurant on Saturday, January 1, between sixty and seventy being present. Mr. T. P. Watson occupied the chair. After dinner an entertainment, consisting of songs, recitations, &c., was given by members of the staff. The arrangement of the programme, and its rendering by the various performers, merited great praise, and testified to the existence of much talent, vocal and elocutionary, in the firm. The toasts of the various departments and workshops were responded to by the managers. In the course of the evening the Chairman remarked that it was a cause for congratulation, and at the same time a singular coincidence, that, in addition to its being the Queen's Jubilee year, it was the Jubilee year of the firm, having been started in 1837.—On Christmas Eve the *employés* of the firm of Messrs. Bradshaw & Battersby, artists, of Victoria-street, Manchester, held their annual dinner at the "Seven Stars" Hotel. Some good speeches were made, and a most enjoyable evening was spent.

** TITLE PAGE and INDEX of Volume for 1886 will be given next week.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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GELATINO-CHLORIDE PAPER.

CHAPTER I.

ALTHOUGH for many years past albumenised paper has held almost undisputed sway, there has been latterly a decided tendency to set it on one side and to adopt some other method of printing in its stead. Whether the question of permanency or of mere convenience of production be the exciting cause of the desire for change it is not for us to say, but certainly it can scarcely be set down to any lack of quality of result, for in many minds—especially amongst the general public—an albumen silver print is accepted as the ideal of a photograph. Long years of familiarity with this class of picture have educated us up to that particular standard, and it will no doubt be longer still before albumen paper with all its faults is cast out from amongst us.

Still, there can be no denying the fact that, especially within the past three or four years, there has been a strong reaction in favour of other styles of printing. The enhanced permanency of the platinum print brought that process into use, but for a long time the cold tone was by many considered an objection. Gradually, however, as improvements were made in the process itself and experience gained in its working, the question of tone ceased to be an obstacle to its employment, and as the general taste came to be educated to the new style of image it began to be recognised that the erst objectionable colour was for some subjects preferable to silver, and that the process lent itself readily to the production of highly artistic results.

Next came the various methods of printing by development upon gelatino-bromide or chloride emulsion paper, and these processes, while giving results greatly resembling platinotype prints, possessed the additional advantage that owing to the greater rapidity of their preparation they were available for use with artificial light, and especially for enlarging purposes. Next came the further modifications in development, resulting in the production of pictures resembling in tone the rich colours obtained with albumen, and for a time popular fancy turned once more in the direction of the old familiar style, with the advantage that a few seconds' exposure to daylight, or a minute or two to artificial light, sufficed instead of the sadly prolonged exposures necessary at this time of year with the most rapid albumenised papers.

But it has always been felt and acknowledged, even by the most enthusiastic supporters of the development printing processes, that it is difficult, if not impossible, to secure perfect uniformity of tone in printing large numbers of prints by these methods. Even though the exposures be made automatically by means of specially designed apparatus, and the prints developed in the same solution, considerable variations in

colour are apparent; indeed, we have seen examples where a number of prints made upon a single strip of paper by successive exposures to a steady artificial light and automatically timed, have varied from one end of the strip to the other from almost neutral black to chocolate brown. Where the prints are developed separately the difference is likely to be even greater, though the difficulty seems to lie rather in the paper itself than in the variations of development.

It is, of course, possible in those methods in which toning follows development to do something towards equalising matters, just as in the case of ordinary albumenised paper where slight variations in tone, arising from longer or shorter exposure in the pressure frame, may be modified by the deposition of more or less gold. But this power is limited in the case of developed prints, owing to the greater difficulty in securing desirable tones and controlling the action of the gold bath. Still, whatever means may exist of lessening the want of uniformity, it has been long felt that a process which more closely approached ordinary albumenised paper in its behaviour and results, and which at the same time offered possible advantages in regard to rapidity and permanency, would form a more powerful rival to the old favourite method of printing than any of those we have mentioned.

Within the last few months a process for which such claims are made has been introduced commercially, in the shape of gelatino-chloride paper, for direct printing, that is, for "printing out" without development. Of such paper there are already several brands in the market, but that with which we are most familiar, and which most closely resembles albumen paper, bears the well-known name of Obernetter, of Munich. This, it is claimed, is two or three times as rapid as good albumenised paper, while for permanency it is expected, on theoretical grounds, to be far superior, though, of course, it is too early as yet to speak with any certainty on that point.

No doubt albumen has secured anything but an enviable notoriety in connection with photography on account, as many believe, of the sulphur which forms one of its constituents. Certainly if the want of permanency alleged against albumen prints be traceable to its sulphur, then we must acknowledge that an image formed in a layer of gelatino appears to offer greater chances of permanence owing to the proportion of sulphur it contains (if any) being so much smaller. On the other hand, if we look at the physical characters of the two substances, albumen and gelatine, the latter appears to offer the greatest chance of dangers arising from carelessness or imperfect manipulation. Not only do these dangers lurk in the direction of mere convenience and comfort of working, but also in that of permanency. The

first we may, perhaps, disregard, since if it should eventually be found that the gelatine print is really more permanent, a little extra trouble in its preparation would be but a small price to pay for the advantage. But if there be any circumstances connected with the employment of gelatine for the purpose in question which seem to hold out a chance of danger, it is as well that they should be recognised at the outset, and not allowed to counterbalance any possible advantages.

FOG AND FOGS.

WE dwellers in the Metropolis have an idea that we are in a position to show something entirely unique in matters meteorological. The photographic dwellers in the large towns of the Midlands or the northern counties, or still further north across the Tweed, are forced to submit to loss of business from time to time, sometimes for periods extending over days, but the atmospheric conditions that have already prevailed so long here are *sui generis*. The evil effects of this state of things are not merely local. London, including by the word the outlying suburbs, being the source of the greater part of the enlargements made for photographers throughout the whole country, a complete blight falls for the time over the work of hundreds of provincial studios, for enlarging can scarcely proceed, and artists are literally idle. We so often hear complaints of the latter that it is but fair to show the other side of the question, and to point out that while in many places, north or south, a little dull weather, not anti-photographic, prevails, it is possible for the light, day after day, in town to be such that no painting worthy of the name can be done.

Apart from this local aspect of the peculiarities of this particular season of the year, there is the more general loss to business to be considered. There are few days when outdoor work can be done; but as, with the exception of frost pictures—and the present winter has already offered unusual facilities for this beautiful kind of work—the photographic demand market is practically closed at this time of the year, no one suffers much in consequence. In the studio the very opposite condition of things prevails; the growing distaste for Christmas cards has led to a greatly increased demand for *carte* or cabinet portraits to take their place, and a foggy day or two in the month preceding Christmas Day may make a difference of scores of pounds to some photographers.

This is felt all the more since the attainment of the great rapidity that characterises modern photography practically enables the operator to laugh at dull days. But when a fog invades the precincts of the studio, though the light may be actinic enough, high-class work has been held to be impossible, and the artist is compelled either to lose his client or to send out work that he is ashamed of, as he can scarcely label it upon the back, "This was taken on a foggy day; please excuse."

In some quarters great hopes have been felt that by means of electricity fog particles, after the manner already described in these columns, might be caused to disappear. It is a very pretty laboratory experiment to fill a bell-glass jar with smoke, and then, discharging electricity through it, cause the smoke particles to coalesce into groups and rapidly subside into a layer at the bottom of the jar. Why should not the fog particles behave in the same way? it is argued. In the first place, fog particles are naturally repellent as to their surfaces; they are supposed to consist of small spheres of water, not

vapour, each with a minute coating of a tarry nature, which prevents them running together and forming large drops. Secondly, and this is far more important, the whole experiment so far has been successful as a laboratory experiment only. A year or two ago there was scarcely a scientific periodical published which did not contain glowing accounts of this process having been applied on a manufacturing scale to cause the deposition of the valuable smoke or fumes from the chambers of the lead manufactories, smoke that was highly deleterious in its effects disseminated in the atmosphere, and the exit of which represented the annual waste outflow of so many tons of lead. It is perfectly true that this process has been applied on the manufacturing scale, and we know that large Wimshurst electrical machines of extraordinary power have been "installed" for the purpose. But—this is what has been omitted in all the accounts yet published—no measure of practical success has yet attended the installation. We do not say commercial success will not be ultimately attained, but up to a recent period it very decidedly had not been.

Hence we fear that for the studio no hopes for the present must be built upon the power of electricity to aid. Closing of the doors and windows as much as possible, and keeping up a good heat, night and day, the former especially, are still the sheet anchors of the operator who watches for the departure of the fog so eagerly.

It was not, however, our intention in discussing fog and its effect upon photographs, to close our review by stating that a roaring fire was the only palliative, and that cure there was none, for we have lately been making some most promising experiments of a very practical character. Others may have tried the same, but if so we have not heard of them.

The effect of fog upon photographic operations, to be thoroughly understood, must be viewed in a twofold light. There is first the loss of light caused by the radiation from the sun or the clouds being partially arrested. Granted quick plates and a sufficient exposure, the slowness of action of the light would be the only cause of complaint if there were no other factor to be considered. Unfortunately, however, there is another, the most important, for, secondly, the particles of fog which arrest the more actinic radiations, and so cause the yellowness and consequent slowness of light, likewise reflect the former rays more particularly. Hence the position is this: the fog outside the studio allows only a small quantity of photographically powerful light to arrive at the sitter; the fog inside the studio reflects in all directions, and, consequently, into the lens, so large a quantity of actinic radiations that every part of the plate receives them. The result is a foggy negative, just as though the plate itself had been exposed to a weak light. Let this be clearly understood and our point will be clear. The fogginess of the negative obtained when there is fog or mist between sitter and lens is produced by the mist acting as a reflecting radiator of light, and not as a filter or screen. If we prevent the fog radiating light it might be present in large quantity and produce no more harm than if the studio windows wanted cleaning.

In practice this could be effected by having a long tunnel of dark material reaching from the lens to within a short distance of the sitter. The only light received by the fog in the tunnel would be just at its mouth, where its effect would not be perceptible; the only fog affecting the plate would be the foot or two between tunnel and sitter, and it might be ignored.

This suggestion, founded upon experimental trials, must not be confounded with the old "tunnel system" of studio building.

for the light screen we propose would extend well into the illuminated part of such a studio, being brought, indeed, so near to the sitter as just to avoid interference with the lighting it is intended he should receive. If any one will draw a plan of his studio he will find that a tunnel made on this principle, and allowing a full-length view, might be brought up to within two, or, at most, three feet of the figure without casting a shadow, while the distance of a narrower tunnel for half-lengths or vignettes would be reckoned by inches.

In conclusion, we do not hesitate to say that the adoption of such a structure would entirely obviate evil effect on the foggiest day, and when the light was not totally gone many sitters might be taken, and high-class results obtained, when without its aid there must have been loss or the sending out of indifferent workmanship.

Our contemporary *La Nature* has generally some interesting article or paragraph about photography in its weekly pages, and last week its editor (M. Gaston Tissandier) gave a popular account of results already achieved in night photography. Moonlight exposures, as our readers are aware, are no novelty, and this M. Tissandier admits; but the illustrations accompanying his article are of a decidedly advanced character, if they are, or at any rate one of them, is a fair reproduction of the print. It represents a view of the bridges of the Rhône—"facsimile of a photograph taken by moonlight with one hour's exposure." The first moonlight view of the series, taken also in an hour's time, is but indifferent, through the indistinctness of the foliage, owing to the action of the wind. One novelty in connection with it is a white streak suggestive of a huge comet, but which we are informed is the track of the moon during the long exposure, before the expiration of which it had left the field of vision.

If any one desired to obtain anything but a silhouette of trees, with a background of clouds, it is difficult to imagine a more absurd mode of getting a moonlight photograph than one involving that luminary's presence in front of the lens.

There is, however, a capital view of a display of fireworks, about which the editor had received so many queries that he obtained from the photographer a description of his mode of working. It was simple in the extreme, and did not by any means involve the presentment of literal truth, "for," says the writer, "the rockets standing out upon a black ground, I had no need for an instantaneous shutter, as I had remarked in photographing the electric spark in an absolutely dark room. All depended upon obtaining a sufficient length of exposure to enable an image to be obtained of a sufficient number of rockets without that number being so great as to cause confusion."

The radiometer, after a long period of silence, is to the fore again. Years ago, when the marvellous little instrument was first invented by Mr. Crookes, much was expected as to its photographic usefulness; but it was quickly discovered that, for the plates of the day at any rate, its indications could not be relied on for actinometric purposes. The latest idea with regard to it is that the rate of its revolutions might assist the man in charge of the governor at gasworks in deciding when to put on extra pressure as the daylight begins to wane.

The phosphorescent powder forming the basis of Balmain's paint, the luminous tablet of Warnerke's sensitometer, &c., is known to be in the main a compound of sulphur and calcium, though the exact mode of manufacture is not public property. M. Verneuil has lately given detailed instructions for manufacturing what he terms the most beautifully phosphorescent matter known. The formula runs as follows:—Twenty grammes of lime from the *Ilyopus Vulgaris* shell calcined, is pulverised and intimately mixed with six grammes of sulphur and two of starch. To this mixture is added, drop by drop, a solution containing half a gramme of sabintrate of bismuth, one hundred

centimetres of absolute alcohol, and some drops of hydrochloric acid. When most of the alcohol is evaporated, by exposure to the air for half an hour, the mixture is heated in a covered crucible for twenty minutes to a clear cherry heat. After pulverising the mass it is again calcined for a quarter of an hour. If not too strongly heated the product obtained is small grained, lightly agglomerated, and easily crumbled. A new pulverisation is to be avoided as it tends to diminish the phosphorescence. The additions of sulphide of antimony, cadmium, mercury, tin, copper, platinum, &c., produces a variation in the colour of the light which varies from yellow-green to blue-green. Manganese produces an orange tint. Sulphides of cobalt, nickel, iron, and silver diminish the phosphorescence. It is thus seen to be probable that a powder might be devised which should act upon gelatine plates in exactly the same ratio as daylight.

ONE of the dangers attendant upon the looking upon star maps as unerring guides is exemplified in a little discussion that lately was carried on among the Liverpool astronomers. At the annual *soirée* of the Associated Societies of Liverpool, a photograph was exhibited of a portion of the Orion nebula, in which twenty of the stars are represented by lines. The exhibitor considered that the lines were not from stars at all, but from planetoids, and that the lines represent their amount of proper motion during the sixty-seven minutes of exposure. The editor, in a note in the *Journal of the Liverpool Astronomical Society*, looks upon this as a hasty conclusion, and thinks the stars had been allowed to run and that the plate had slipped.

THOSE who were at the lantern meeting of the South London Photographic Society last week, had an excellent opportunity of judging the utility of the electric light for lantern purposes. The lantern and light were under the management of Mr. Davenport, and a brilliantly illuminated screen at the extreme end of the large hall of the Society of Arts, the lantern being at the other end, was maintained without intermission during the whole evening. The arc light was used, and the lamp employed was a Siemens's of what is known as the "focus-keeping" type. The current was taken from a secondary battery charged by a Siemens's dynamo. Of the suitability of electric lighting for the lantern, when working on a large scale and the arc light is used, there cannot be two opinions.

Unfortunately the costs of the plant for the electric light renders it prohibitive for general lantern purposes unless there happens to be an installation on the premises. When this is the case, as it is at the Society of Arts house, all the additional apparatus necessary is the lamp—not a very costly affair. The time will no doubt arrive when secondary batteries will be supplied ready charged, at a much more moderate cost than at present; then, probably, the arc light will be more generally employed when pictures have to be shown on screens of extra large dimensions. Until this time—long promised by electrical enthusiasts—arrives, electricity for the lantern will continue to have a successful rival, both in economy and convenience, in compressed gases.

ON more than one occasion we have directed attention to the effect of the condensation of moisture on negatives, which generally takes place when there is a sudden rise in the temperature in winter. Here is another inconvenience to photographers that often arises through condensation, though the real cause may often be unsuspected, namely, a prolonged exposure in the studio. When the fire is lighted after a very cold night, and the atmosphere becomes warmed, the moisture in the room condenses on the inside of the windows. This moisture is frequently charged with fumes given off from the stove, or with smoke escaping from the flues, which often occurs when the fires are first lighted; consequently in a very short time a thin, yellowish-brown film is formed on the inner surface of the glass. Again, when there is a sudden increase in the temperature out of doors, if the glass be cold, moisture condenses on the outer side. This, especially in large towns, is usually highly charged with smoky matters which form a very non-actinic coating on the glass. These alternate condensations inside and out, quickly form films on

the windows which, although they may not be very conspicuous to the eye, stop out far more actinic than is usually suspected. With orthochromatic plates these non-actinic coatings should cause but little inconvenience.

THE squeegee is a simple tool which, considering its general utility, does not find a place in nearly so many photographic workrooms as it deserves. If a plate of glass or metal, for example, has to be dried a single stroke of this useful appliance will do it in an instant. If a solution or water be spilt on a table or bench it can be more effectually removed by one or two strokes with the squeegee than by a far more lengthy operation with cloths. For quickly removing hyposulphite from large prints, as described last week, it has no equal. Those who make it a practice to have a squeegee always at hand ready for the thousand and one purposes to which it may be applied, are the ones best qualified to speak as to its efficacy.

NOTHING forms a much better lantern screen than a sheet of pure white paper, when the screen is of small dimensions such as those generally used in the drawing-room. A thick and strong paper, well suited to the purpose, is sold by most artists' colourmen. It is known technically as continuous cartridge or drawing paper; it is four feet six or five feet wide, and may be had of any desired length. The price is about eightpence or tenpence per yard for the thickest kind, which is the one that should be employed. A couple of yards of this paper, cemented at one end to a common blind roller and the other to a lath, forms one of the most efficient lantern screens that can be had, while its cost is but a mere bagatelle. When out of use it is rolled up, and then takes but little room, and will be always ready at a moment's notice.

FROM a letter in our "Correspondence" columns it will be seen that there is a prospect of an active Photographic Society being speedily formed in the northern portion of our great city. The North London Photographic Association was organized in 1857, and met once a-month for several years in Myddelton Hall, Islington. There were many men of mark connected with it, among these being Charles Woodward, F.R.S., George Shadbolt, J. J. Cole, and others. It eventually died of inanition. About a year ago some gentlemen residing in the northern suburbs were about to resuscitate the Association when they learned that an Amateur Society was then in existence in that district, although of so modest a nature that it was only with difficulty its very existence was discovered. This young Society it is that is to form the nucleus or groundwork upon which is to be erected one of wider scope, and which will be a worthy successor of the once famous North London Association. We commend Mr. Smith's letter to the notice of all North London men.

TEMPERATURE IN THE LABORATORY.

It is but a week or two since we wrote on the subject of the *Lessons of the Frost*, and now we have been visited with a fresh and even more severe attack, the thermometer having sunk as low as 10° Fahr. Under such circumstances it is only to be expected that developing trials have been severe in even the best regulated families or laboratories, though the past week's experience has been sufficient to prove the value of the simple precautions and expedients we suggested in our previous article. Not a single bottle became frozen where those precautions were adopted, and when the tap water was raised to 60° by means of a jug of hot water from the kitchen, development proceeded as rapidly and as comfortably as at any other time. But we gained another experience which was curious, to say the least. Before the frost set in a number of bottles, which had contained emulsion, were placed in a sink of stone in a room used for general cleaning purposes, and filled with water in order to thoroughly soften the gelatine before using hot water. There they remained for three or four days, during which time the temperature

had varied between 50° and 10°. Happening to pass through the room we noticed one of the bottles broken, and at first imagined that "the cat" had been at work, but upon closer examination we found that every bottle was broken—burst, in fact, by the conversion of the contents into solid ice. The surface water had frozen first and so confined the whole, and when the bulk became solid its expansion of course brought about the fracture. These bottles were small ones, holding five ounces. A large, one-gallon glass bottle in the same apartment remained intact, it having frozen only round the sides. Several bottles of solutions of hypo, alum, carbonate of soda and potash, &c., also remained intact, their contents preventing their freezing; not so a bottle of chloride of gold, one grain to the ounce. Its solid contents were not sufficient to prevent its freezing, consequently it had to succumb. Moral, when there is frost about take care that, unless the temperature of the laboratory is kept up, no bottles are left unnecessarily with water in them. Strong or saturated solutions do not matter.

One other circumstance struck us. We mentioned in the articles alluded to the uncertainty that may arise in winter from the practice of employing saturated solutions, showing that what might be a saturated solution in the depth of winter might possibly be less than half the strength of one made in summer. Here is another way in which the temperature may affect a compound solution. Having emptied the developing-room bottle of sulpho-pyrogallol we went to the stock bottle in another room for a fresh supply and found it partly frozen, about one-third of the contents being liquid. Some of this was used to develop a plate, when, as we were prepared to find, the action was extremely slow and the density far greater than we usually obtained with the same plates. The cause was palpable; the liquid portion of the contents of the bottle consisted of a *concentrated* solution of *pyro*, while the sulphite of soda, originally saturated at a higher temperature, had partially crystallised out, and so the balance of contents was altogether upset.

C. BECKETT LLOYD.

LANTERN MATTERS.

I SHOULD like to say a few words about an experience I have lately had with my modification of the oxyhydrogen jet, as lately described and figured in this JOURNAL and in the ALMANAC. This experience has opened my eyes to a new and very important use for this addition to the jet, and I think I am justified in bringing the matter under the notice of readers who, about this time, are engaged with the optical lantern.

I was asked to give a lecture for a Society whose balance-sheet, at last audit, showed a credit of the not very magnificent sum of 5s. 6d., and it was imperative that I should, as much as possible, keep down expenses. To employ my usual operator would have entailed a disbursement of several guineas, so I resolved to trust to my own jet and an "operator" who had never seen the limelight before. This may seem, to experienced lanternists, rather a risky experiment, but "all's well that ends well," and this is how I managed. Before the audience came in at all I turned my tap full on, got up the best light possible, centred and focussed the disc, and so was quite ready to start. But, having no superfluity of hydrogen, I did not want to burn even the small jet of my bye-pass, so I left the "normal" taps just as they were when the light was at its best, turned down my own taps, and *cut the gases off at the bags*. Just before going on to the platform I turned on the bag taps, lighted the small hydrogen jet passed by my bye-pass, and when I gave the signal to my operator he simply turned my tap full on, and we had a splendid light which never was touched till my half-time interval, when I turned on a little more oxygen as I found the flame a shade too red. The light remained splendid without interference to the end of the lecture.

I was using for the first time a jet (mixing) made by Mr. Newton, of Fleet-street. The nozzle of this jet is less bent than any I had ever before used, and I found, as I expected, a vast improvement in the light arising from this circumstance. So far as I can by experience determine the incandescent area for showing slides on a screen should not be too small, not altogether a "point." When a somewhat large area of lime is covered, I think the illumination is more even, and I am sure the lime does not "pit" so much. I do not

like the "pitting" of the lime, it is dangerous for the condenser, and I fancy the light is not quite so good. With other jets, where the nozzles are considerably bent and the flame impinges at a smaller angle on the lime (that is, strikes it more "straight on"), I have found deep "pits" in the lime, and the lime almost invariably has split after a short time. On the last occasion, with the straighter nozzle and the more obtuse angle, the lime was not really "pitted," and did not split at all either during or after the lecture; it would do again if required.

I have only two or three times used the limelight for micro-work, but in these few cases I have found a "point" of light better than a larger "area," and there was no condenser in any danger. But for screen work I am inclined to favour a pretty straight nozzle and a fair area of incandescence.

ANDREW PRINGLE.

WHAT IS AN AMATEUR?

ONE of the latest contributions towards the solution of the vexed question, What is an amateur? is Mr. Adcock's able and thoughtful paper read before the Camera Club, in which he discusses at some length the motives which first of all induce to the adoption of a hobby, and afterwards the lines upon which that hobby should be ridden. Starting upon the broad basis that an amateur is one who follows some particular pursuit as a means of profitably filling up what would otherwise be waste time, the writer shows how the nature of the selected pursuit may vary according to the circumstances of the individual, and that what may in one instance be downright hard labour is perhaps in another healthy recreation.

But it follows naturally that the chosen hobby should be one to which the amateur is naturally attracted, that, in fact, the element of love should step in, otherwise the very term amateur is a misnomer. This condition fulfilled, we have the true amateur. But this does not even touch the vexed question of the day, "What constitutes an amateur for exhibition purposes?" Here we have entirely new conditions introduced, and it is the disagreement on these points, well exemplified in the discussion which followed the paper, that constitutes the bone of contention. Mr. Gifford insisted that an amateur should prepare his own plates in order that all might be on terms of equality, while the author of the paper, as well as Mr. Rodgers, held that the art aspect of photography should be the more prominent. As another speaker, Mr. Farrell, pointed out, each side is no doubt right from its own point of view, the decision depending entirely upon individual idiosyncrasy; the amateur with a leaning towards the chemical side of photography will attach the greater importance to and derive the greater pleasure from that portion of his work, while he of an artistic turn will view that portion of his labour as merely the means to an end. Consequently so long as the vicious distinction between amateur and professional exists at our exhibitions, so long will the divergence of opinion continue.

After all, the distinction, so far at least as it affects exhibitors, is but a modern one. It is but a brief period since the custom of offering prizes for amateurs only was instituted, and then simultaneously cropped up the question of status. Let us, then, drop the custom, and with it the uncertainty as to who are and who are not entitled to compete as amateurs; for obviously, if justice is to be done all round, it will be necessary, as suggested by Mr. Farrell, to establish a series of grades, varying from the amateur who regards the *technique* as the all in all, to the one whose contribution to that branch commences and ends with the removal and replacement of the cap of the lens.

This, after all, is only a distinction between amateurs themselves, with a view of placing all upon equal terms, but there still remains the classification of amateur and professional. I see less reason still to perpetuate this distinction, for the mere fact of a man making his daily bread by photography scarcely tends to cultivate his artistic perceptions to any higher point than he would be competent to attain as an amateur. Nor does his constant application to photography as a business lend him any great assistance in the production of pictures suitable for exhibition. These are not found, as a rule, among the everyday productions of the commercial portraitist, or landscapist either for that matter, who in order to become a successful exhibitor must devote a considerable amount of time and thought to unremunerative work, and who in fact, for the time, assumes the *rôle* of amateur.

The amateur, on the other hand, labours under no disadvantage on account of the bulk of his energies being devoted to some business or profession other than photography. The fact of his having embarked in the pursuit indicates a predisposition in its favour, and even if the time actually devoted to his hobby be limited to the utmost, he will, when so engaged, bring to bear upon his work an amount of energy and freshness of mind scarcely to be expected from the professional, jaded as he must be with the mechanical drudgery of his daily task. Less still need those happy individuals complain whose time and resources are devoted unrestrictedly to the practice of the art. Let us then sink all distinctions and throw every competition open to all comers. Let those who feel themselves incompetent to take part in the struggle without being handicapped or classed, wait until, by dint of work and study, the race seems open to them; and I venture to say that our exhibitions are not likely to deteriorate either in quality nor quantity of matter.

With regard to the subject matter of Mr. Adcock's discourse, when I come to the "What?" I cannot help thinking that the author sets a somewhat difficult task to his hearers and readers. I know it is a good precept to "aim high," but in practice it may lead to disappointment and failure. It is not every amateur, whatever may be his artistic attainments, who is in a position to devote sufficient time to the "study of figure" to score success. Models are difficult to find, and still more difficult to imbue with the feeling the artist intends to convey; and, though a successful figure study is of all artistic efforts the most valuable, there is no branch in which photography fails so miserably when it only reaches mediocrity. Mr. Adcock himself has made his mark in this line, but I fear not one in ten even with his energy and training and devotion to the pursuit, would have been so successful, while I am quite sure not one in a hundred of the rank and file of amateur photography have the time, means, or resources that are necessary to ensure even a moderate degree of success.

Just one other point in the paper I would touch upon briefly. Mr. Adcock says:—"Refuse to give prints except in special cases," but, he goes on to say, find a small photographer and give him the printing to do at a fixed charge, and make your friends pay. This, I submit, is straining the "amateur" question too far. It may or may not be a question whether an amateur ceases to be such if he charges his friends cost (or any other) price for their pictures, but I take it to be a different question altogether, and a decided injustice, if he is to be debarred from *giving away* prints. In the first place, no injustice is done to professionals—that is what Mr. Adcock desires to guard against, and it is a most laudable object—for in ninety-nine cases out of a hundred the sitters of an amateur are pressed into service and made use of by him for his own sake—the sake of practice—and they would never have thought of going to a professional to be photographed. But setting that on one side, most amateurs worth the name would prefer to lavish a little more care on the production of their own prints for friends than would be likely to be given to them by a "man with a small business" who is to charge a "fixed and not high price." The description of the workman, and the conditions under which he is to work, do not suggest a high class of probable result, while I am afraid if he were in a larger way of business he would either refuse the job or charge a sufficiently high price to pay him for the inconvenience of going out of his ordinary way. Photographers, as a rule, do not care to execute any more printing than is required to supply their own clients; such is my experience. If they have not much printing of their own to do, perhaps their work is not of the best.

If the amateur, instead of being allowed to freely give his prints to friends, is forced to choose between the course suggested or making a charge himself, I am afraid the result will be that his negatives would soon be of little value to him, and gradually he would cease to take the trouble to produce them. But such a restriction is quite unnecessary.

H. Y. E. COTESWORTH.

ORTHOCHROMATIC PHOTOGRAPHY.

[A Communication to the London and Provincial Photographic Association.]
ORTHOCHROMATIC photography, although not new, is at the present time receiving a large amount of attention both by dry plate makers and photographers. It is a curious fact that a discovery to render

the yellows lighter than the blues was not taken up with more zeal at the time of its discovery, and that it should have laid semi-dormant for some years until a commercial firm takes to supplying the public, which starts it into life again. I am referring only to England, as on the Continent they have employed it for some years, but we English are always somewhat behindhand in taking up a new discovery.

I am not going to discuss who is the legitimate claimant of producing orthochromatic effect in photography; but it is my intention this evening to give you the results of my experiments as far as I have gone (there is nothing original in the chemical I employ, it being erythrosin, and that was discovered years back), and to place in your hands a really good orthochromatic formula, but with one drawback, they will not keep many days.

The formulae which have been published compounded with eosine and ammonia, into which dry plates are to be dipped, have in my hands proved useless, and I believe others have found the same. One of my experiments shows me that chloride of silver dissolved in ammonia with eosine and used as a bath gives orthochromatic effect, and I should imagine that if a plate is made containing chloride of silver and then bathed in a solution of ammonia and eosine it ought to answer; probably this may account for the failures of those using the ammonia eosine bath with ordinary plates. After various experiments with different compounds with eosine or erythrosin, I found that carbonate of silver dissolved in excess of carbonate of ammonia and mixed with the erythrosin gave me the best effect.

The orthochromatic effect in a plate is due not to eosine or any other stain being an optical sensitiser, as some state, because you may stain the film as much as you please still the yellows will refuse to impress themselves upon the film, but I believe it is due more to a chemical change which is produced by having free silver present as well as a new compound formed with the erythrosin.

Although I discovered the above (*i.e.*, the use of silver carbonate with eosine) quite independent of anything that had been published, I see that I have been somewhat forestalled in the publication of the formula, as last week in the *News* appeared a formula with ammonia, silver, and eosine, by Vogel, and, I think, the week previous another formula containing fluoride of silver, carbonate of ammonia, and eosine, which practically amounts to the same as I have given above. Mr. Hastings will bear me out in what I say, as I confided my formula to him some four or five weeks ago. However, I need hardly trouble you with all this.

After trying various proportions, I find the following to work fairly well:—

Silver nitrate	20 grains.
Ammonium carbonate	90 "
Water, distilled	16 ounces.
Erythrosin (2:1000)	10 drachms.

The plates are placed in this for two minutes. A rinse in distilled water gives less chance of stains, and then placed in a rack to dry. Let me here state that if they are used in the moist condition the orthochromatic effect is practically *nil*; they must be used quite dry. By this treatment the plate is rendered three times more sensitive.

I must insist upon the necessity of using only ruby light, the plates having now become so sensitive to yellow that the greatest precaution must be taken in handling them.

My chief reason in not giving you this formula before was the great difficulty of developing the plates free from fog; this I am glad to say I have now overcome. I pass round a plate half of which is quite free from fog. This was got rid of by soaking the exposed plate before developing in the following:—

Potassium bromide	120 grains.
Ammonia	$\frac{1}{2}$ ounce.
Water	10 ounces.

Do not allow to remain more than thirty seconds, well rinse under the tap, and proceed to develop with any of the usual developers—ammonia, potash, or ferrous oxalate.

If there is much blue in the object to be copied, a yellow screen must be used if exposure is to be made by daylight, although by gas or lamplight it is quite unnecessary. The best effect is always secured by gaslight exposure.

A very good substitute for coloured glass is to colour a collodion film and strip it from glass. The glass should be rubbed over with talc or a solution of wax in ether, and well polished off, and coated with collodion containing methyl orange. The dried film should appear decidedly orange. The stripped film can then be gummed to the cap of the lens, having cut out the centre first, and used preferably behind the lens.

The carbonate of silver and erythrosin may be mixed with an emul-

sion, but requires great care. It should be mixed at as low a temperature as possible, and the plates used as soon as dry, as their life is very short. The orthochromatic effect is very marked, and the speed increased about ten times. If any one is desirous of trying this I give the following:—

Emulsion (containing, say, 200 grains silver)	10 ounces.
Silver nitrate	10 grains.
Ammonium carbonate	45 "
Erythrosin (2:1000)	5 drachms.

Before development they must be treated with the ammonia and bromide.

Very fine results can be obtained from collodion emulsion, in fact, the results far surpass gelatine, and can be used by daylight without the necessity of employing a yellow screen at all, but, alas! like gelatine, do not appear to keep any better.

The bath for a collodion emulsion plate is best made as follows:—

Silver nitrate	10 grains.
Ammonium carbonate	45 "
Water	2 drachms.
Spirit, methylated	8 ounces.
Erythrosin (2:1000)	5 drachms.

Dissolve the silver in a test-tube by heat in two drachms water, and add the carbonate of ammonia bit by bit till all dissolved. Add the spirit gradually to the hot solution, and finally the erythrosin. Place the dried collodion plate in this solution for two minutes and dry; the plate before development to be treated with the ammonia and bromide, and developed by ferrous oxalate, three to one, to each ounce of which add three grains of bromide.

If mixed with the emulsion it begins to fog at the end of three days, so it is better to dip the plates as required. The exposure is only four times more than a fairly ordinary rapid gelatine plate by daylight, and by gaslight they are about equal.

The action of the erythrosin silver compound renders the collodion film exceedingly tough, very much like an alumed gelatine film, and is very difficult to scrub off the glass afterwards.

I must now leave you to try for yourselves all I have stated, and trust some of our members will make further experiments to produce something better and more lasting than what I have done.

J. B. B. WELLINGTON.

ON THE PRODUCTION OF TRANSPARENCIES FOR THE OPTICAL LANTERN BY THE WOODBURY PROCESS.

[Abstract of Communication to the Photographic Society of Great Britain.]

THE specimens of artistic photography, as I venture to call them, which I shall show you this evening, are so called because they are absolutely untouched. They will include some of the most commonplace objects and grimy scenes, and owe all their artistic value not so much to the beauty of the object as to the selection of point of view and the accurate rendering of the light and shade. If therefore they appear to stand out in stereoscopic relief upon the screen it is only because the light and shade are accurately rendered. This alone confers upon them the right to be considered artistic; and, being done by pure photography, seems to me to be incontrovertible evidence that photography may reach the position of a true art. The greater number of course will be microscopic subjects, the extraordinary beauty of which is, primarily, entirely due to the great skill of Mr. Evans in this particular branch. But I shall show a few others to emphasise the principle involved in their production.

I will return to this part of the subject later on, and proceed at once to the method of printing. It is hardly necessary to describe the Woodbury process to this Society. The usual pellicle of gelatine made sensitive with bichromate of potash was exposed to light behind each negative; the soluble gelatine unacted on by light washed away; the remaining insoluble *relief* pressed, by hydraulic pressure, into the lead forming the *mould*, from which the casts, or prints, in a pigmented solution of gelatine, are in fact the slides before you.

As however the permanence of all photographic pictures is important, it is necessary that I should say a few words as to the probability of their permanence. I produce one which was exposed to light for many years in a show frame; the red all faded out of it long ago, but the black remains. It was also exposed to great extremes of moisture from the every-night condensation on the window, the paper binding having completely perished from that cause; but the gelatine film is uninjured, though unprotected except by the cover-glass. I was however quite prepared to hear that fungi attacked the unprotected film in Burmah, for I have seen many such in this country. It will therefore perhaps interest you to

know that a coating of plain collodion will not only protect the slide from any such attack, but go a long way towards the perfect restoration of those already badly diseased, leaving hardly any visible trace. As a matter of fact, also, every slide that I have issued since 1879, when the business came into my hands, has been so, or similarly, treated. I may as well mention here that I have found this same plain collodion the best of all varnishes for gelatine negatives, its tenacity being remarkable when of the suitable horny kind. The negative I produce so protected was left out of doors and forgotten during the many winter months of the winter 1884-5, with the bichromated gelatine too, in one of the commonest of printing frames, buried in the snow for days together, and is practically uninjured.

Still I have not trusted alone to varnishing. For the last two years all my slides have been provided with a gelatine which would appear to be practically imperishable, the addition of bichloride of mercury completely protecting it; at any rate, under the more unfavourable condition of being swollen with moisture, from all mildew or other signs of decomposition. The only pigment employed is pure lamp-black collected from the tip of a benzoline flame, which gives the superb brown you now see.

Mr. Evans will tell you of the happy chance which resulted in our meeting, but he probably will not tell you what our real difficulties were in carrying out his projects, or how we surmounted them. The object in view was to secure photographs which should be faithful reproductions of what he saw in the microscope. This necessitates the greatest nicety of illumination, of which you must allow he has shown himself a master. It necessitated the use of the ordinary microscope appliances, and the photographing of the objects through the eye-piece, and consequently a great variety of objections. Subjected to this crucial test, their performances varied sufficiently to cause some difference in the value of the results, but it was decided to go on, aiming at pictorial quality rather than microscopic definition.

The principal difficulty however was in obtaining negatives suitable for my purposes, for I am pleased to see that it is at last recognised that process has a good deal to do with the type of negative that should be considered good. What is generally considered as a fair-printing negative is my ideal of the worst possible type, namely, one that is many times over exposed, and supposed to have been saved by development. We gave that an exhaustive trial, having full faith in bromide and ammonia, combined with brains. But our brains failed us utterly here, and would have abandoned us altogether if we had not abandoned bromide and ammonia for a fairly reliable normal developer, and been guided by exposure alone.

A distinctly acid, fully saturated ferrous-oxalate developer is the most powerful and rapid developer I am acquainted with, too rapid for comfort in most cases, yet with it to obtain a perfect negative of one subject may require prolonged development, while another to be equally perfect would be developed in less than a minute. I illustrate this by producing one of Mr. Evans's earlier negatives, which, being far too feeble for my purpose, I took the trouble to reproduce. The positive was made on one of Ramsden's slow bromide plates, made specially for me for the purpose, without exposure to light during manufacture, and the one now shown was the result of one second's exposure to a lamp flame, and six hours' development in the strongest ferrous oxalate developer many times renewed. I was so fascinated with this that I reproduced many more, every succeeding exposure proving more and more fully that exposure is everything, developer quite secondary.

I cannot imagine why the ferrous-oxalate developer has fallen into disfavour; the latitude of exposure is enormous if only a fair printing negative is desired. Its effects may be summed up thus:—Less than one unite of exposure will give an under-exposed negative utterly useless for any process. One unite of exposure will give an ideally perfect negative, clear glass in the deepest shadows, but may require very prolonged development with the strongest solutions possible. Two units of exposure will give a brilliant negative suitable for platinotype, developing usually in three or four minutes. Four units of exposure will give a good silver printing negative, developing in less than a minute.

The time occupied in development depends necessarily very much upon the degrees of contrast in the subject. These remarks therefore apply primarily and more particularly to those of no undue extremes of light and shade; in a word, to those subjects which photography is capable of rendering artistically in monochrome. Cases, however, occur which present more than ordinary difficulty in microscopic objects, for instance, preparations of insects of a dense non-actinic brown, as the thorax, while the wings are almost perfectly translucent. In ordinary everyday photography an analogous case

is presented by a distant snow-clad range of mountains with dark near foreground. In these cases a very prolonged exposure is necessary in order to preserve luminosity in the deep shadows, but accuracy of exposure is only the more essential, and then a well-watered developer—or, more simply, a nearly-exhausted developer—will secure the desired result.

I do not think that many photographers whose experience has been confined to silver printing alone, are capable of judging what qualities in a negative are necessary for other processes. For my own purpose I prefer the minimum exposure allowable—that is, the ideally perfect positive collodion picture on glass, developed or otherwise brought up to printing density, a type of negative in vogue on the continent some fourteen years ago for silver printing by Angerer, of Vienna.

Of course, we all know that albumenised paper presents extraordinary facilities in the hands of expert printers for obtaining good results from very different classes of negatives. It is, in my opinion, a dangerous property, and one that has done much to retard progress from the want of a definite standard of quality in negatives.

But I am wandering from my subject, which is the Woodbury process. Here I am at home, for I have found in it a process which will do all I require without retouching, if the negatives are right.

Mr. Evans will confirm my statement that if a negative retouched in any way comes to me the first thing I do is to remove the retouching completely. But I willingly confess that I sometimes retouch extensively, but it is entirely limited to the inevitable process known as spotting, for which the Woodbury process offers facilities which are simply irresistible. Plates of commercial makes do sometimes have slight pinholes or opaque spots. Microscopic objects abound with dirt specks in the mounting. All these are remorselessly cut away, as they are developed as projections easily removed either on the gelatine relief or the metal mould. But I have not yet dared to meddle with the modelling that nature does, for the simple reason that with the gentlest guidance she will do it for me.

GEORGE SMITH.

CAN PHOTOGRAPHY LIE?

[A Communication to the London and Provincial Photographic Association.]

I WILL try to analyse and see whether our beautiful art-science can be put to such base use. I have an abhorrence for untruth, and hope to meet with your forbearance when I presume to occupy your time in a discourse to which I feel myself little able to do justice; I am nevertheless assured that you will excuse my shortcomings, and with this encouragement will try to expose the culprit, and, if I can, will endeavour to find an excuse for his shortcomings. Although entailing several digressions, I will adopt the easiest and most familiar way, and go through the operations with the geni of science to whom I have the honour to address myself.

My professional day breaks, but not my fast, therefore must do both to nerve myself for my exertions. Scarcely have I given my mind to this important *initium* when I am bothered, no, honoured, I should say, with a gentleman whose duties in the City lay upon him the additional obligation to choose such an inconvenient hour for the laudable gratification of his desire to perpetuate his present appearance through my humble instrumentality. He enters with such airs as seem to be required for the occasion, makes the usual remarks about the suitability of the weather, informs me in the same breath that he can only grant me five minutes of his presence, tries to bind me down to finish a proof same day, and, this being found impossible, asks the earliest opportunity when I shall be able to do so; and three days hence being mentioned as the earliest possible date, informs me solemnly that that very evening being the time when he leaves town for a considerable period, hopes that he should not be disappointed, and, requesting me politely to make haste, follows me into the studio. He only wants a bust, but is not quite sure whether his legs should be appended thereto, but, yielding to my suggestion as to the impracticability of such a pose, leaves it entirely to me, which somewhat restores my hopes of settling a dispute with my inner man, who seems somewhat unreasonable just now. Alas for human expectations! My sitter has altered his mind now, and wants a cabinet. Having exchanged plates I emerge once more from my dark room, my inner man revolting all the while, but, suppressing the voice of the deep, effectually succeed in composing myself, the picture, and the man, who, not being very partial to the head-rest, indulges in strong epithets upon that already much-abused instrument. However, with heroic effort I adjust, persuading him to grin and bear it. He objects to the one and submits to the other, and while he is listening to my sudden, incoherent talk, in which I make a desperate effort to count seconds at the same time, the trick is done (thanks to my pneumatic shutter), he protesting that he has moved, while I give him the contrary assurance. The young lady not having arrived yet I cannot hand him over to her persuasive talent, so, on his hurried preparation to vanish, I have to leave development to handle the pen instead.

"Good morning! Afraid shall lose my train! Send the proof on."

"Beg pardon, but it is our rule to pay at time of sitting."

"Oh, must I pay a deposit?"

"No-o, that is not necessary; but to save booking, confusion, &c., we prefer the whole amount."

"I leave my card. I have never before paid anywhere. I am a friend of the Lord Mayor's footman. You can inquire. It is monstrous! It is —"

However, on my calm insisting upon payment, and finding no more answers to my arguments, he disburdens his conscience, and thinks having to pay once he may as well do it now. I think so too, and hastening back to my coffee I hope to get an opportunity to study my next sitter a little more in order to accomplish my task of detecting the liar. Now, liars are not very candid, so I have to be vigilant. That I myself should have been guilty of that for which others are called to account by me matters little, for, according to ancient usage, it is not at all necessary to see the beam in one's own eye, but it is very desirable to expose the mote in the other. Now for another cup of coffee; another lump of sugar wanted. Whether it is coincidence or sarcasm, my wife responds with an assumed substitute in the shape of a fair lady sitter, who, if she is innocently unaware of her sweetness, must be convinced of being a lump, for how could she be deaf to the groanings of my newly mended posing chair! Exquisite subject, though, for my contemplation. This time the sitter is introduced to me in the stronghold of my labours, the studio, by my young lady assistant, who has the audacity to expand her arms insinuatingly in apparent imitation of the arithmetical rules of bulk. I have some difficulty in preserving my dignity and administering a visionary rebuke, which is, however, totally lost to the intended recipient by the interposing object of my operations. I bow politely, explaining away the lady's fears that she never makes a good photograph, beg of her to be at her ease, in which kindly meant suggestion I miss the mark, however, for, it being hot, she looks at me in astonishment, and, through the combined use of fan and handkerchief, leaves it not uncertain that she wants to convey to me that ease is out of question. An additional headache is not considered a deterring circumstance, inasmuch as I am informed that the photograph has to be finished by her husband's birthday, which happy event would occur within three days, and, if it did not give entire satisfaction, I would of course give another sitting free of charge, finishing up with the earnest request to be represented in such a manner as not to exaggerate her form, which, though it could not be called thin, was decidedly not of such dimensions as would account for the extraordinary size by which she had been misrepresented by previous photographs. What a splendid chance for the embellishment of my subject!

"Head and shoulders? Yes, madam. Pray stand there."

"I hope you will not keep me long standing. Can I not sit?"

"No, madam. If I am to rightly represent your features" (I had nearly blundered out, "reduce your features") "you must kindly stand. Turn a little, please. No, no; I want to show the front. You will excuse, but a slight turn imparts grace, when such is naturally present."

At this juncture I carry my point, and having introduced a longer focus lens into the camera proceed to focus. If any little delay is occasioned by the changing of the lens, it is always advisable to display either all the scientific knowledge you possess, or so much of it as will suffice to fill up the interval. By so doing I nearly forgot to take cognizance that my fair sitter's hair, in colour, represented the very lowest strata of the spectrum, which fact obliges me to use a plentiful supply of powder. After having thus isochromised my subject, I draw most of my curtains to ensure the necessary reducing effect, which, to some little extent, a well arranged set of curtains can do if they have not been shifted too much or too little, give a full exposure, and, at the sitter's request, a glass of water and *Punch* (I mean, of course, the comic serial) to the sitter, and repair to my dark room, which, through the introduction of a single sheet of canary medium in place of the deep ruby red, has lost many of its horrors. I proceed to remove a burnt sienna backing (which, by the way, I procure from the nearest oil and colour shop, and apply to all my plates) by passing one hand to and fro under the plate, which I hold with the other under a stream of water; this proceeding has the additional advantage of soaking my plates. I then apply a developer,* which consists of the smallest quantity of pyro compatible with density, and of the highest permissible allowance of ammonia .880, restrained with such minimum of bromide as will just prevent fogging. By this means I find out with tolerable certainty whether the exposure was correct shortly after immersing, and before it is too late to apply more of the restrainer, the immediate addition of which I think advisable in every case, when, upon the application of the developer, it becomes evident that the plate has not been under exposed. When the first indication does not afford me sufficient clue as to the correctness of the exposure, I examine quickly by transmitted non-actinic light, which then, from the greater or lesser density, constitutes a sure guide. When I know or find my plate to be under exposed I reject it at once; but in the exceptional case of not being able to take another negative, and suspecting under exposure, I flood the negative first with a weak, unrestrained, ammonia solution,

* Since writing the above I have become a convert to the potash developer for some plates, and soda developer for others.

and then apply the normal developer. By the help of artificial light (which, for dark-room illumination, I hold to be a *sine qua non*) I am well able to control the density of my negatives to such an extent as to make the use of the intensifier an exception. Should I have to resort to one, I have a partiality to the one recommended by Monckhoven. As far as my own observations go this method seems to be permanent. I now rinse my negative, pass quickly through a salt bath to arrest osmotic action, wash well in a syphon—which holds my plates perpendicularly—fix in sodium thiosulphate (I scorn hyposulphite), wash well in a syphon, and dry my plates on pegs driven into the wall very near the ceiling, just over the kitchen fire, or, if necessary, hasten this process by repeatedly flooding with methylated spirit.

Do not however imagine, Mr. Chairman and gentlemen, that I am so much wanting in courtesy as to keep my sitter waiting while I thus ruminate. No, no, even if my lively imagination had tempted me to that it would have been of little avail, for before I have time to finish, tap, tap, tap, on my dark room door, a voice, "Is the focus a success?"

To which astounding display of amateur knowledge I can only faintly retort, "Yes, the focus is," and I added inaudibly, "but the focal length might have been still greater."

Examining the negative, however, I have cause to congratulate myself, for so far I behold the negative counterfeit of my fair sitter in such an aspect as only three years' exercise in a lady's modern drill class, aided by Madame Rachel, could possibly impart. My thoughts fly to the still more beautifying process of retouching, and overflowed with joyous anticipation of the resulting portrait, and noxious fumes nearly bursting—the door open, I announce that the result is all that could be desired.

The lady's gracious parting remarks that if the portrait should please her she would recommend countless numbers of her lady friends whose focus coincided somewhat with her own, brought me back to my subject, and I began to wonder whether it was right to pencil an untruth to please a customer. I answered the question to my satisfaction in a very convenient way. I reasoned, firstly, that if a photographer placed a photographic instrument before a very stout sitter and took a negative copy therefrom without more ado, he should in all probability exaggerate his subject; that would be a lie of necessity, but also would undoubtedly be a financial failure if indulged in to a considerable extent: this failure would be inexcusable in the eyes of the world. If, on the other hand, with the aid of posing, lighting, swing back, long focus lens, and retouching, he could produce the other extreme, and did so, he would still be a liar, but his lie would be an excusable one, and, furthermore, would not be attended with commercial failure. But here the artist painter steps in, dictating to keep the truth, and the following dialogue is suggested to my imagination.

Photographer. So you would have me portray my sitter's individuality—faithfully represent character, not even minimise the stoutest form?

Artist. Yes, that only is true art.

P. Pray, sir, what would you do if your sitter dressed her hair in a totally different fashion to what she usually wears it, and twists and turns her mouth until all individuality is gone?

A. I should most assuredly suggest an alteration, and paint naturally from observation.

P. I could not do that, because I should not find it out until the portrait is finished. You may alter *ad libitum*. Your paint does not cost much, and you get £20 for your work; I get £1, and every alteration entails an outlay of several shillings. Moreover, you require several sittings; I have to do the work in one. You converse, conceive, and idealise, and perpetuate at once; I may converse, and conceive the ideal, but only wish that I may get it.

A. But, my dear sir, the instantaneous process.

P. Much of that is an exaggeration, as I think I can prove some of your work to be.

A. Do not add insult to injury.

P. I have no intention of doing so, but I can prove to you that you do not represent your subject truly at all times.

A. That is impossible. I study the character of my sitter, give a natural pose, light my subject well, foreshorten where necessary, and there you are!

P. Now if your subject is such as would be quite unrepresentable in the truly natural state?

A. Oh, then I moderate it just a trifle to make it acceptable, you know!

P. I have caught you now. By your own words you prove, in a simple manner, what I meant to prove more elaborately. You have saved me that trouble.

A. Oh, you incorrigible! I will give you a little of my mind. I could never see that a photographer should be entitled to use the name "artist."

P. Well, I will explain that. An artist, with all the qualities inherent which make him so, will still have to learn the mechanical part of using brush and colour; he conceives the idea, he composes his subject, he idealises it, distributes lights and shades, and reproduces the whole on canvas.

A. Now, what does the artist photographer do?

P. Why, up to the mechanical reproduction, he does the very same thing.

A. Well, my good friend, what happens then?

P. Why, then the photographer bears off the palm, for his genius has

a still further task to accomplish. Every study or subject which has to be conjured up in thought only by the artist, will have to be produced and brought face to face with the camera, and very often needs training; and then, O! then, if the photographic paint would but take kindly to the paper! Alas, how much canvas—in the shape of dry plates—is spoiled before success rewards the effort!

But enough of this. It is time to recall my thoughts from imagination's flight, or I fear my patient hearers will wish me to use my wings until I am happily out of sight.

Speaking-tube whistle: "Baby cabinet; be sure you get a good one. Lady says that you have a reputation for babies."

Though this is rather an undefined compliment, I feel nevertheless flattered, and consequently cannot very well refuse to please the mother by fulfilling her desire to make it appear as fine and large a child as possible. Oh, dear! As far as I am able to judge through the speaking-tube, the dear's consent has not been obtained. All doubts on the matter are completely removed when the dear, on its way to the studio, propelled by the mother and dragged by the nurse, insists upon indulging in the process of voice strengthening to an extraordinary degree. I meet it with a toy, but in return am met with a slap in the face. However, I am not disabled, so lend my whiskers to inspire confidence. Unfortunately, I have to retreat, but remembering that my reputation might be somewhat at stake, I determined to hasten matters by the suggestion to hoist the dear upon a chair. That being impossible, I try in succession swing, balustrade, pedestal, tricycle, table, and then the floor. This proved to be the safest ground to work upon, for the darling rolled itself into a laughing fit, when, with the help of a doll, a trumpet, a musical box, and a bell, I actually succeed in focussing the little prince, as his mother called him. Little prince, indeed! His only princely qualities appeared to be the way in which he ordered everybody about. I call him a despot.

There, now; here was a chance. Dear! dear!

"Madam, you must kindly leave it entirely to me. You spoiled it."

"But I must see the darling's legs."

I saw that too, so I tried again, when, in consequence of the too close proximity of the mother, I obtained too many legs that time. I got six, the baby's in duplicate, and the mother's as well. My efforts to induce the little tyrant to take possession of the posing chair were more successful this time, the mother proudly watching this offspring of affectionate nature's pranks, sitting by its side, a veritable illustration of maternal pride.

Here is the picture, Mr. Chairman and gentlemen. I value it because it constantly reminds me of the lesson it conveyed when I committed the indiscretion to show the negative. With the mother's sudden exclamation that it only wanted Punch the other side, it dropped, accidentally or purposely I know not, but that only was saved. As it was the best expression baby was capable of exhibiting in its present state of existence, it was agreed to print a vignettéd copy from the savings. Receiving intimation that Mr. Spark, who brought an electrical apparatus to be photographed, could stay no longer, I had to hasten matters. As the negative of the baby had purposely been taken with a C.-D.-V. lens, and consequently made it appear a bigger child, I had no difficulty to persuade the mother to accept it, and bidding adieu with a secret good riddance, I prepared for the electrical spark—I mean Mr. Spark—who brought the instrument. It was made entirely of brass, of a deep yellow colour, with blue handle and foot. It occurred to me to use an azaline plate. I placed a yellow glass medium behind my lens, but could not obtain a sharp image. I therefore hit upon the plan to pour colour-stained collodion over the back combination of my lens, which had the desired effect. For experiment's sake, I then exposed an ordinary gelatine plate through the yellow medium on the same object. It proved to be almost identical with the azaline plate. Subsequent comparisons with stained and unstained plates gave me similar results. Whether it had been forgotten to stain the plates, or whether the stain that rested upon them was, that they were only imperceptibly more sensitive to the yellow rays, I will not presume to say. I shall try Mr. Ives's process next.

(To be continued.)

J. HUBERT.

Department for Inexperienced Photographers.

HOW TO MAKE A NEGATIVE.

We shall at present dismiss all considerations respecting a camera and stand (concerning which we shall have a good deal to say in subsequent articles), and shall take for granted that these are already in the possession of the young photographic aspirant in whose interests we are now writing, but who does not as yet quite clearly know how he is to proceed to work.

Having mounted the camera on the stand, let it be pointed towards some out-of-doors subject on which there is well marked light and shade. This may be a brick wall in a garden or a house at no great distance, by preference one on which the sun is shining obliquely at the time. Should any "sisters, cousins, or aunts" happen to be in the scene no special harm will arise, only as the first trial may not be all that is

desired it is wise to operate under such circumstances as to prevent unpleasant inquiries being made, just at first, as to the measure of success, and to bury one's sorrows in secret.

Rack the lens or camera in or out until the image is seen clearly depicted upon the ground-glass—the focussing screen—of the camera. Here note that the focussing screen has a two-fold use: it serves the purpose of composition by enabling the operator to see precisely the nature of the picture he is ultimately to obtain as a negative, for which purpose he must dodge, in or out, the legs of his tripod, or rotate the camera a little to one side or the other until he is satisfied with the pictorial effect.

When thus composing a picture it is well at first to do so without any stop or diaphragm being inserted in the lens, as the greatest possible illumination, quite irrespective of sharpness, is here desirable. The proper arrangement of the subject having been secured, next try and make the image as sharp as possible on the ground-glass, which is the second function performed by the focussing screen. It is quite possible that the image may be sharp in the centre and fall away, in respect to definition, towards the sides. To rectify this insert the largest diaphragm and note the effect upon the image. One use of a diaphragm is to extend the area of sharp definition to the extreme edges, another being to extend the range of sharpness from a near to a distant object. Should the first diaphragm not give the marginal sharpness desired, then must each smaller in succession be tried until the sides are sufficiently well defined.

To permit of the image being clearly seen upon the ground-glass, a focussing cloth is necessary. This is an opaque square of black flexible fabric such as velvet, which, when thrown over the camera must be so capacious as to permit of its covering the head of the operator whose eyes must be at least ten inches from the focussing screen. This cloth, by preventing the light from behind from falling upon the ground-glass, permits of the image formed by the lens being distinctly seen, which without such an adjunct would not be the case. If the beginner is not gifted with very sharp sight he may with advantage have recourse to the aid of a small magnifying glass so as to ensure the utmost possible sharpness when focussing.

We now turn our attention to the plates. Having obtained a packet of dry plates the suitable size for the camera, they must be brought in a room into which not the slightest vestige of white light finds admission. Let the light proceed from a candle or lamp so carefully covered by deep ruby glass or ruby paper as to render impossible any ray from it escaping into the room, except those transmitted through the coloured screen. The faintest white light falling upon the plates, even for an instant, will cause them to fog and be rendered useless. Having opened the parcel, ascertain which is the coated side of the plate, and place it in the slide, face down, taking care to fasten down the back. Of course this may be done at any time, even one or two weeks or even months anterior to the time of using the plates in the camera, but special care must be taken that the slides containing the sensitive plates be kept away from the light in the interval, because no matter how closely fitting the various parts of the slide may appear to be, it is not impossible that a little light may be admitted. The precaution of keeping each "loaded" slide in a bag of black calico or an envelope of brown paper cannot be too strongly insisted upon.

It is in giving the exposure that the greatest errors will be perpetrated at first, and regarding this no rule can be given. If one second's exposure be given at first, the tyro will, upon developing the plate, ascertain whether this has been too much or too little. The mere act of exposing is simple. Having ascertained that the subject is focussed, cap the lens, remove the focussing screen, and insert the dark slide. Draw the shutter from the latter, and when all is ready uncap the lens for a second. Having replaced the shutter, remove the slide to the dark room.

There are two systems of development, one by iron and the other by pyrogallie acid. We shall describe the former first.

Having previously prepared, in separate bottles, a saturated solution of protosulphate of iron (saturated in the sense that the water can dissolve no more, and that there are undissolved crystals still lying on the bottom) and a saturated solution of neutral oxalate of potash, and having previously added two or three drops of sulphuric acid per pint to the iron solution to ensure acidity, lay the plate down, face up, in a flat developing dish, and pour over it enough water to cover the surface. Allow this to stand, carefully protected from the red light, while three drachms (or parts, according to the quantity required) of the iron solution are poured into a graduate, to which is then added a quantity of the potassium oxalate solution sufficient to make two measured ounces. The mixing of these two solutions, colourless in themselves or nearly so, produces a red fluid, the colour of which, however, will scarcely be observed in the red operating light. Now, tilting up the dish containing the negative, pour off the

water, and then pour in the ferrous-oxalate developer which has just been mixed. Rock the dish gently backwards and forwards to ensure the liquid passing over the face of the plate, and if the exposure in the camera has been correct, an image will speedily begin to appear on the plate.

The sky and best-lighted parts will show first, followed by those portions that were not so well lighted. By slow degrees the whole image will be out. It is desirable to continue the development until the half tones shall have become merged into the high lights, scarcely anything remaining visible but the deepest details. At this stage the plate must be removed from the dish and subjected to a rinsing with water. When held up against the light all the details will now be seen. If these appear to be imperfect it is not yet too late to return the plate to the developing dish for further treatment.

When it is believed that the whole details have been brought out in a sufficient degree, it is rinsed, and then transferred to a dish containing fixing solution. This may consist either of cyanide of potassium or hyposulphite of soda. There are several reasons why the latter may be preferred. In this case a degree of strength of four ounces to the pint of water will be found to make a fixing bath of average strength. By immersion in this solution the white coating of the plate disappears; this can only be properly ascertained by lifting up the negative and examining it from the under or plain glass side. It must remain in this solution a little longer than suffices for ensuring the removal of the white film, after which it is placed in a dish of water to secure the removal of the hyposulphite of soda. In this dish the water must be very frequently changed. It is difficult to say precisely how long a negative should be washed, but it is safe to leave it in changing water for half an hour.

After this it is reared on end to dry.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 369.—“Improvements in Printing Frames for Printing Photographs and the like.” Communicated by J. C. A. Hermitte, J. Y. JOHNSON.—*Dated January 10, 1887.*

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS AND STANDS.

No. 2039. HARRY LUCAS, 32, Little King-street, Birmingham.—*February 12, 1886.*

My present application is based on my provisional specification, No. 11,311, 1885.

I propose making my camera wholly or partly of metal, with the ordinary bellows body and a loose base, and I attach the camera to the base by an improved method. I make what I may conveniently describe as two grooves, one near each end of the base and running crosswise on it. These grooves stand above the base, and face the ends near which they are placed. The back and front of the camera fit into these grooves, and are fixed by screws.

The camera stand I make of telescopic tubes, with improved methods of adjusting and fixing them, so as to regulate the height of the stand. By one method I put a female screw on the end of one tube which receives another, and on the inner tube, a free male screwed collar, with one or more cuts across the threads.

The screw collar engages with the female screw, and binds the inner tube at any desired part.

By another method, I put a spring catch or bolt on one tube, which shoots into a hole or notch on the next tube, when the tubes are drawn out to the proper position.

IMPROVEMENTS IN OR CONNECTED WITH PHOTOGRAPHIC LENSES.

No. 2063. LOUIS GEOFFROY, 59, Frith-street, Soho, and WILLIAM FREDERICK BARTON MASSEY-MAINWARING, 30, Grosvenor-place, Middlesex.—*February 12, 1886.*

The improvements consists in arranging a binocular camera in such a manner as to produce one image on the sensitised plate, instead of two as heretofore employed for stereoscopic pictures, and by the simultaneous impression of two dissimilar pictures in the same place to obtain a more natural and increased relief in a single picture or view than in one taken by a single lens.

In carrying the invention into effect, the back lenses of stereoscopic cameras are so formed that their last surfaces are prismatic in such a degree as to converge the centres of their images to one point on the receiving sensitive surface; or the same result may be produced by means of separate prisms placed near the back of the lenses.

According to another arrangement we may employ such portions of a lens of greater diameter than the width of the eyes as correspond to the positions of the lenses in a stereoscopic camera, and thus obtain the desired result by the refraction of two images to one point on the sensitive surface.

Or we may obtain a similar direction of the rays of light to this end by the use of suitably inclined mirrors, or by any other optical arrangement by which the same result may be obtained.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS.

No. 2365. CHARLES DAY DURNFORD, Ordnance Store Department, Edinburgh.—*February 18, 1886.*

THE object of my invention is to provide for use an extremely convenient, effective, and compact photographic camera, with which object I construct this camera as hereinafter described.

The base of the camera is made in two parts, which are hinged together, and on the edge of one of these parts is erected the front of the camera, which front may be made in any convenient manner with the usual aperture lens and other appliances. The front part of the base is of sufficient size to enable the hinder part thereof to be turned up to enclose the back and other parts of the camera when desired, and a rod is fitted which may slide in one or more sockets on or in the base, and enter a bracket formed thereon on the front part or edge of the base to make the whole base very rigid, and to assist in producing this effect the end of the rod and the aperture in the bracket into which the same enters are preferably bevelled, whereby the rod is wedged in position. To the rear of the base on each side are fitted extension pieces, which are so hinged as to be capable of folding in alongside the rear edge of the base and of being opened out in continuation of the lines of the sides of the base in all positions, being on the same plane therewith, and on these two extension pieces may be the usual racks for the extension of the camera. When these two pieces are closed alongside the rear edge of the base, the same may be held in position by a T piece on the end of the aforesaid sliding rod, or otherwise, and when these two pieces are opened out the same may be held in position by blocks or chocks on the bottom of the back of the camera, or otherwise.

The back of the camera is made, as is usual, of a frame divided into two complete frames or parts, which are extensible the one to the other, but these two parts are not connected together by the ordinary transverse bar and other appliances, but by two preferably L shaped levers, one being on each side. One end of each lever is pivoted on a bracket projecting from one part of the back, while the other end is jointed in the proper position to the other part of the back, and a tail piece may be fitted on the rear side or elsewhere of the lever, which can work in a socket formed therefor and can act as a stiffener, and, if required, as a stop. A sliding stop also is preferably fitted to clamp the lever when the two parts of the back have been duly separated, or are in other desired positions in respect of each other, and the parts of the stop and lever so in conjunction are preferably bevelled, whereby the stop and the lever are wedged in position. On the top of the back may be fitted a suitable slotted bracket, projecting from one part of the back, in which slot travels a pin fixed in the other part of the back, and a sliding stop can also be fitted to clamp this bracket on both, being similar bevelled edges for the purpose aforesaid.

The bellows of the camera are formed in the usual manner, but to render unnecessary the usual size and depth of the back frame of the camera required by reason of the very deep folds of the bellows all the rear or back parts of my bellows are formed with extremely shallow folds for such a distance as may be deemed necessary, and these extremely shallow folds may be either very gradually or suddenly or only comparatively suddenly increased in depth, with the object of not intercepting the rays of light from the lens, thus permitting the use of a smaller back than is usual.

The dark slide may be fitted to and used with the back of the camera in any usual manner or may conveniently be supported in position by an extension of or a ledge on the bottom of the back, being retained thereon by studs and sockets, while the upper edge of the slide could be held by a catch or otherwise, and the sensitive plates can be held in the slide in any usual or convenient manner.

The camera so made as aforesaid can be hinged on one edge of the top or table of the tripod or other support, or still more conveniently the camera can be secured as usual to this top or table, which top or table can be hinged to the tripod or support at and on one side, and in either case the camera could be maintained in position by an hinged stay passing through a socket on the opposite side of the top or table or of the tripod itself or elsewhere, in which socket the stay could be secured by a clamping screw or other appliance, and on the loosening thereof the camera can regain its horizontal position, or the camera can be otherwise supported in its vertical position.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 17	Notts	Institute, 9, Shakespeare-street.
" 18	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
" 18	North London	Myddelton Hall, Upper-st., Islington.
" 18	Belton Club	The Studio, Chancery-lane, Bolton.
" 19	Bury	
" 19	Edinburgh Photo. Club	5, St. Andrew-square.
" 19	Hyde	Mechanics' Hall, Hyde.
" 19	Manchester Club	
" 19	Bristol and W. of Eng. Amateur	Queen's Hotel, Clifton.
" 19	Photographic Club	Anderdon's Hotel, Fleet-street, E.C.
" 20	London and Provincial	Mason's Hall, Basinghall-street.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at the ordinary monthly meeting of the above Society, held at 5A, Pall Mall East, London, Mr. James Glaisher, F.R.S., President, occupied the chair.

Messrs. C. G. Collins, James Martin, Hedley M. Smith, and the Rev. W. D. Fenning were elected members of the Society.

The CHAIRMAN said that a paper having failed them at the last moment

Captain Abney had come forward with something to occupy their attention, and the meeting was indebted to him very much for his kindness.

Captain W. DE W. ABNEY, F.R.S., here exhibited one of that class of photometers in which two beams are taken from the same source of light to make the measurements, so that the variations of the light being equal in both beams, such variations do not affect the accuracy of the results. His photometer consisted of a paraffine flame with a lens about one foot off; a transparent print on glass of an image of the sensitometer screen was placed close to this lens; a second lens, about a foot further on, threw an image of the slide upon a screen about four or five feet off; close in front of this screen was an upright rod casting a shadow across the image. Another beam of light from the paraffine flame was received upon a plane mirror, and reflected thereby upon the same screen, upon which, therefore, fell altogether two shadows of the rod. In the path of the reflected beam of light was a circular disc with sectors, which opened and closed. This wheel was made to rotate when required by means of electro-magnetic apparatus, and by adjusting the size of the apertures in the disc, the two shadows of the rod upon the screen could be brought to the same intensity. The readings of the photometer were in terms of the dimensions of the apertures at the times when the two shadows were equal. The paper was entitled *A Measure of the Densities of Photographic Deposits, with some Remarks on Sensitometers*. The author said that if he took a plate which had been "sensitized," and wished to ascertain its photographic value by visual methods, how was he to proceed? He usually adopted Rumford's principle, applied by means of the apparatus before them, to which he had referred last year when he made the statement to the Society that he had an improved method of measuring the intensities of coloured lights, and one that was better than the employment of a candle flame. In photographic investigations it enabled him to bring any part of the photographic image into the centre of the field, and when there to measure its density independently of possible variations in the source of light. When the densest parts of negatives are dealt with, it was necessary to use a stronger light. For anything above five degrees the photometer before them was very accurate indeed. He exhibited a curve of the relative intensity of a negative taken under Spurge's sensitometer. It was nearly a straight line, and by further experiments he had found out that the optical and photographic values of his particular negatives were almost absolutely identical. He thought a good sensitometer screen could be made by developing with ferrous oxalate, containing a little bromide of potassium. He had compared the optical with the photographic values by means of platinotype paper, which answered well except at one end of the scale, where it gave feeble blacks, perhaps in consequence of having been too thinly coated. He thought Spurge's sensitometer to be the most accurate one in existence, although in some respects, perhaps, not so convenient as other instruments.

The CHAIRMAN asked if the standard candle, or Sir William Harcourt's light, were likely to be superseded as standards of measurement?

Captain ABNEY said that a Committee of the British Association was dealing with the subject of a standard of light. He hoped they would decide upon something before long, but it was a very difficult subject.

Mr. FRIESE GREENE asked whether Rumford's measurements, taken by means of two candles, would not be simpler than the plan before them?

Captain ABNEY replied that, with the candles, only the general intensity of the image could be taken, and not the intensity of any particular portion.

Mr. W. F. DOXON asked whether the longer path through which one of the beams of light travelled did not affect the results?

Captain ABNEY replied that it did not. The apparatus would not enable him to ascertain the intensity of the light; it would only let him know the density of any part of the negative through which the light passed. Five years ago the late Dr. Guthrie had a photometer made on the principle of that before them, and they worked at the subject together.

Mr. ARNOLD SPILLER said that the device for opening and closing the sectors while the disc itself was revolving was very ingenious; would Captain Abney describe it?

Captain ABNEY did so, but the details would be inexplicable without the aid of diagrams.

Mr. W. K. BURTON, C.E., said that the commercial sensitometers he had used were a weariness of the flesh, they differed so from each other.

Mr. H. TRUEMAN WOOD asked whether Captain Abney could use the apparatus before them with the grease-spot photometric indicator, for the distance of the mirror from the lamp did not seem to matter much?

Captain ABNEY replied that he could do it, but should then use a lens.

Mr. W. BEDFORD asked what hopes there were of obtaining a standard photographic screen and a standard light.

Captain ABNEY said that they could only take the existing standards of light, of which he believed Siemens's to be the best. He could not recommend a phosphorescent screen; he had two which varied greatly and had misled him in things he wanted to know. He was on the British Association Committee and had been working for three years at experiments on standards of light; he hoped that an electrical standard of light would come out before long.

Mr. T. BOLAS said that the chief feature of the apparatus before them was that it was independent of variations in the source of light, and gave the power of measuring the densities of different parts of negatives.

After a vote of thanks to Captain Abney, Messrs. Ince and Francis Cobb were appointed Auditors, and Messrs. W. Bedford, Addenbrooke, F. Cobb, W. K. Burton, W. M. Ashman, and George Scamell were appointed Scrutineers.

The CHAIRMAN announced that all nominations for members of Council must be sent in on or before Monday next. Those arriving on Tuesday will be rejected.

The proceedings then closed.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, January 6, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. William Bedford presided.

The CHAIRMAN read a letter from Mr. York to Mr. Henderson, calling

attention to two negatives, one of which had been kept in a dark slide after exposure, and another, taken at the same time, had been wrapped in paper; the paper had had an accelerating effect after exposure, as proved on developing the two pictures.

Mr. A. L. HENDERSON thought that perhaps the paper was a little damp; the accelerated negative was not fogged.

Mr. J. B. B. WELLINGTON then read a paper upon *Orthochromatic Photography* [see page 21].

The CHAIRMAN remarked that it was a clear paper, free from vague statements; the question remained how to make the plates keep.

Mr. B. J. EDWARDS said that it was a curious thing that up to this time no practical notice has been taken in England of discoveries lying at our very doors. It is a fact that at the present time all the principal work done in Paris in the copying of paintings is orthochromatic, and at the Inventions Exhibition at South Kensington were some of Taillier's results, which did not attract much attention from photographers but won a silver medal. Nearly all orthochromatic plates contain a fluorescine of some kind, as can be seen on reference to the patents taken out in this country during the last three or four years. Colonel Waterhouse was the original discoverer of the use of eosine as a colour sensitiser; he did this in 1876, but did not find out how to apply it to gelatinobromide plates; in 1882 he was followed by Taillier, and in 1884 by Vogel. Mr. Wellington had just recommended the use of ammonia and alcohol with the sensitiser, and Taillier in his patent mentions the necessity of using ammonia as a vehicle. In the preparation of orthochromatic plates it is necessary to get the right kind of eosine, for there are about thirty-five varieties altogether; it is also a fact that not every gelatinobromide plate can successfully be made orthochromatic, and it is likewise the case that an eosine which will work well with one kind of plate will sometimes not work well with another, consequently elements of uncertainty are present. He possessed some plates made by Taillier's process more than a year ago, and he believed that they were in as good condition as ever. There was nothing in the process to prevent the highest sensitiveness, and he thought that eosine properly applied would not be a source of danger to the keeping properties of the plates; he was making experiments in relation to the latter problem. He wished to draw attention to a coloured design and to orthochromatic prints therefrom, which he then laid upon the table.

Mr. W. E. DEBENHAM asked whether both the plates used for the negatives were employed with or without the yellow screen.

Mr. EDWARDS replied that he had been assured that both had been taken with the naked lens and no yellow screen; he had produced similar results himself in that way.

Mr. DEBENHAM said that Mr. Edwards had made a statement that eosine without ammonia was quite useless. The use of eosine in ammonia was a special claim in his patent. He (Mr. Debenham) had used eosine without ammonia, and specimens of the results, which he would now lay before the meeting, proved that under those conditions eosine had a very decided effect. He found that not every plate was suited for the process, and that when he used the yellow glass as well as the eosine he obtained the full advantage of the two. He had found that an ordinary plate containing an iodide did not succeed when used with an eosine bath, but that a plate prepared with pure bromide answered the purpose; his experience, however, was very limited.

Mr. J. R. GOTZ remarked that Dr. Vogel had told him that there should be no iodide in the plate.

Mr. WELLINGTON said that in his experiments the emulsion contained one per cent. of iodide.

Mr. EDWARDS stated that with some samples of eosine he was using a comparatively large proportion of iodide.

Mr. W. H. HYSLOP asked whether more than four of the eosines mentioned were made commercially. Manufacturers told him that practically only four were in the market.

Mr. EDWARDS said that those four were liable to vary indefinitely.

Mr. HENDERSON stated that up to the day before he had been a great sceptic as to orthochromatic photography, because those commercial plates which he had tried did not give the alleged results, but the day before Mr. Wellington had sent him some plates which had caused him to alter his opinion. To try the properties of orthochromatic plates fairly the solar spectrum should be used; the colours of paintings were far from optically pure, and in different pictures varied indefinitely. By using very rapid plates and a proper yellow screen he obtained good orthochromatic results.

Mr. EDWARDS said that all copies of the coloured design sent out with Taillier's plates were printed with the same colours, so the prints were of equal value for testing the colour sensitiveness of plates. Good orthochromatic plates work best with a yellow screen unless they are first made very sensitive to yellow light. The real advantage of orthochromatic plates is in everyday work, for they certainly give a more correct scale than the plates in ordinary use; in landscapes they give clouds, sky, and foreground in more true relation, and trees are more faithfully rendered; in studio they make a greater difference in the rendering of textures than of smooth surfaces—at least, he thought such to be the case. Orthochromatic negatives need less retouching than others. They do not need a much longer exposure than other plates, and can be used when the light is yellow or the weather foggy; by gaslight an orthochromatic plate is nearly twenty times more sensitive than an ordinary plate.

Mr. A. H. HARMAN remarked that he had had no experience with orthochromatic plates; Mr. Edwards was a manufacturer of them and he (Mr. Harman) was not, but he thought that they were all of opinion that it was a very valuable process, specially useful in large towns to enable photographers to take negatives in a bad light. He thought the yellow screen to be a great disadvantage, and if Mr. Edwards' plates could be used without it, it would be an improvement.

Mr. A. COWAN said that in all the pictures laid before them that evening orthochromatic plates seemed to render the reds worse than did ordinary plates.

Mr. HARMAN remarked about Mr. Debenham's pictures, that with the exception of the rendering of an orange, he thought that altogether the print from the ordinary plate was the best of the two.

Mr. DEBENHAM believed that idea to be due merely to one having been printed a little darker than the other.

Mr. HENDERSON had once obtained orthochromatic effects by adding sulphide of calcium to the emulsion, but the plates would not keep.

Mr. HYSLOP had found Dixon's to work better than Tailfer's plates, when used without a yellow screen.

Mr. HARMAN did not consider the process to be of much value if the plates would not keep well.

Mr. GOTZ said that plate makers accept it as a rule that plates prepared by dipping in eosine do not keep, and that those prepared with eosine in the emulsion do keep; the dipped plates, however, are quick, and the others are slow. Dr. Vogel and others had told him so.

Mr. EDWARDS stated that it was not altogether a fact that orthochromatic plates were slow; they might be slow at first, but could be quickened afterwards.

Mr. WELLINGTON said that his experience was at variance with the statement of Mr. Gotz; his plates proved to be far more rapid when they were not dipped.

Mr. W. H. PRESTWICH was of opinion that if orthochromatic plates came into general use, it might be advantageous to have studios of yellow glass, to give a better scale.

Mr. HENDERSON wished that Mr. Edwards would bring some of his orthochromatic plates to a meeting of the Association, and use them himself, to test for rapidity against his (Mr. Henderson's) plates by gaslight.

Mr. EDWARDS said that if Mr. Henderson would make his very rapid plates orthochromatic, they would work ten times more quickly by gaslight.

Mr. DEBENHAM remarked that about a year ago Angerer remarked that very rapid plates were more orthochromatic than slow plates, so that to get good results it was only necessary to use exceedingly quick plates under yellow glass.

Mr. W. H. HARRISON had recently seen orthochromatic photography reduced to the extreme simplicity by Mr. Theophil D'Haoſw at Ghent University; he used neither eosine nor yellow glass, but waited until nearly twilight, when there were but few blue rays in the light, then placed the coloured objects in a room and far from the window, and photographed them upon ordinary quick plates, but with some such long exposure as twenty seconds. The blue colours in the object found little blue incident light to throw off, hence a vase of flowers of different colours gave a good orthochromatic scale on the negative plate.

The CHAIRMAN stated that Messrs. Dixon & Gray had brought the importance of the subject home to photographers at the last Photographic Exhibition. Mr. Wellington had done more than the majority of experimenters in the subject, by giving his methods and results so fully; if he had published those results a little sooner he would have been in advance of Dr. Vogel.

Mr. J. HUBERT had received some of Dr. Liesegang's collodio-chloride paper, and would give a demonstration to the Association with it on the first Thursday in next month. It gave better half tones than could be obtained with albumenised paper.

Mr. HENDERSON said that Mr. W. Cobb had some collodio-chloride prints about twenty years old, and they exhibited no symptom of change.

The meeting then broke up.

CAMERA CLUB.

THE meeting at the Camera Club, on Thursday, January 6, was a members' lantern-slide meeting. Slides were shown by Messrs. J. H. Knight, J. Gale, Barclay, and Dresser. A number of those recently received in exchange from the American Societies were also put through the lantern.

The chief feature of the evening was the exhibition of a series of fifty slides, accompanied by a very interesting lecture by Mr. J. H. Knight, in description of scenes, manners, and customs in Madeira.

On Thursday, January 20, the subject for the evening will be, *The Development of Bromide Paper Prints*, the discussion to be opened by the reading of a communication from Mr. Andrew Pringle. Meeting at seven p.m.; paper read at eight.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual lantern meeting of this Society was held on Thursday, the 6th instant, at the large hall of the Society of Arts, John-street, Adelphi, W.C., when Mr. T. Bolas, Vice-President, occupied the chair.

There was a very good attendance of members and friends, and, as usual upon these occasions, many ladies were present.

The CHAIRMAN, in opening the proceedings, said his duties were remarkably easy, inasmuch as lantern displays of the kind they were assembled to witness did not require any talking. There was a point, however, to which attention might be directed on account of novelty, and that was the mode of illumination about to be employed. It was an electric arrangement supplied from a dynamo machine working in the basement, and this was supplemented with a series of storage batteries. One of Siemens's lamps was fitted to the lantern, and an illumination equal to something between three and four thousand candles would be obtained. The reading lamp, a Swan & Edison incandescent, was in the system, as also were all the lights in the building. Mr. G. Davenport, who would work the lantern, had devised a new slide carrier that was both simple and ingenious, and this would be used for the first time that evening.

More than two hundred slides were then exhibited upon the large screen, a disc of eighteen feet being projected. The splendid illumination obtained showed that many of the transparencies sent for exhibition had been prepared for a much less intense light, but, on the whole, the display was eminently satisfactory.

Mr. C. Pilkington showed several well-known views near London, all of which were coloured with very good effect.

Mr. W. M. Ayres, as usual, illustrated the capabilities of wet collodion transparencies toned with platinum and gold; many of them were, however, much colder in tone than it is customary to produce.

Mr. T. Charters White divided attention equally between photo-micrographs and the less difficult studies by the wayside.

Mr. F. A. Bridge showed a few of his Belgian series.

Mr. J. Gale illustrated scenes in Sussex with a magnificent series of wet collodion transparencies from gelatine negatives, which elicited much applause.

Mr. W. Wheeler followed with a short series of Aston Hall, Warwickshire.

Mr. J. B. E. Wellington represented the collodio-bromide process with a large number of slides.

Mr. George Smith exhibited a number of various subjects produced in Woodburytype.

Mr. S. A. Allen showed several subjects wherein both positives and negatives had been made on commercial gelatine plates.

Messrs. F. York & Son sent two of their lecture series, which afforded much amusement to the juveniles present.

Mr. F. A. Bridge gave the readings sent therewith.

Mr. W. England showed a series of statutory subjects.

The principal peculiarity in Mr. G. Davenport's new patent slide consists in a prolongation of the metallic runner that carries the slides. This terminates in a certain screen, that in travelling along the guides covers the lens. During the brief period an automatic change of subjects takes place, the effect of which upon the screen was exceedingly good. At the termination the usual vote of thanks was accorded.

GLOSSOP DALE PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting was held at the Society's Rooms, Norfolk-square, on the 4th instant,—Mr. Greaves in the chair.

The minutes of the last meeting were read and confirmed.

The HON. SECRETARY announced that he had received forms of application for space at the forthcoming Manchester Exhibition for members wishing to exhibit.

It was resolved that the Society give a lantern entertainment to the inmates of the Glossop Workhouse, subject to the approval and consent of the Board of Guardians.

Mr. S. D. McKellen and Mr. Chas. Harris, of Manchester, having offered to contribute apparatus and pictures respectively towards the exhibition and *soirée*, it was agreed to accept the same.

Several minor arrangements were then discussed for the forthcoming *soirée*.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association, held on Thursday, January 6, took the form of a lantern exhibition, and was largely attended by the members and their friends.

A very interesting series of slides, entitled *In and about Arbroath*, was shown by Mr. J. Geddes, who delivered a running description of the principal points of interest.

Mr. Geddes objects to the $3\frac{1}{2} \times 3\frac{1}{4}$ size, which has so long been thought necessary, and makes all his slides and plates $6\frac{1}{2} \times 3\frac{1}{4}$; this size of picture being pushed slowly through the carrier has a very good effect, and gives a better idea of the subject than the regulation-sized slide. His transparencies were made some on wet and some on dry plates.

A series of slides sent by Mr. Pumphrey, Birmingham, was next exhibited.

Mr. Andrew Pringle will lecture in the Kinnaird Hall, Dundee, under the auspices of this Association, in the beginning of February. The subject is, *A Tour round the World*, illustrated by a series of lantern photographs.

Correspondence.

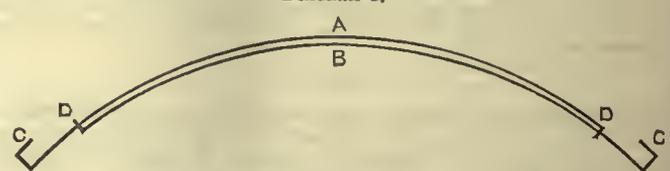
Correspondents should never write on both sides of the paper.

JANUARY MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE.—PRINTING FRAMES REPLACED.—SIMPLE SHUTTER.—LANDSCAPES OBTAINED WITHOUT A LENS.—PHOTO-TOPOGRAPHIC CAMERA.—MODIFIED STEREOSCOPE.—EASTMAN'S ROLLER.—CHLORIDE OF SODIUM AS AN ACCELERATOR.—INSTANTANEOUS CHRONOMETRIC SHUTTER.—PROGRESS IN ELECTRIC LIGHTING.

THE Photographic Society of France held their monthly meeting on Friday evening last, the 7th instant, M. Davanne in the chair.

M. Gorde made a presentation of a photographic accessory, which he has named *glissière*. This object has been invented in order to do away with the heavy and expensive printing presses now employed to obtain paper positives. The instrument is composed of two metal bands sliding one upon the other, being about one-sixteenth of an inch thick and one and a quarter inch wide. The two ends are curved so as to form two kinds of crochets or hooks. In looking at Diagram I. the

DIAGRAM I.

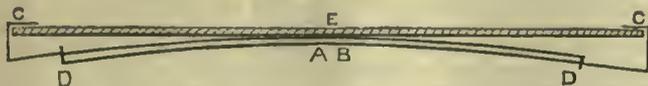


form of this *glissière* can be seen. A and B form the two pieces of brass band sliding one upon the other (probably on this account its name

of "glissière"), held together at DD so as to be lengthened or shortened at will; moreover, as can be seen, this glissière takes the form of a curve and acts as a strong spring.

In looking at Diagram II. its use in photography can easily be seen

DIAGRAM II.



and understood. E represents a glass negative, on which the instrument is fixed.

To print a paper proof the negative is taken and the sensitised paper laid upon it; a padding of blotting-paper is now placed upon the sensitised paper; a glass plate, of the exact size as the negative, is now put upon the blotting-paper (this glass plate has been cut into two parts). The curved point of the glissière is now put on one of the sides, and the spring forced down until the other curved point goes over the other side of the negative and so holds the whole together. Another spring is put upon the other half of the negative, and the whole is ready to put out to light. In order to examine the print to see if it is sufficiently printed, the glissière is lengthened. By pulling it out at C it leaves the plate immediately, and takes its curved form as in Diagram I. The piece of cut glass is taken off the print, and if not sufficiently printed the glissière is put on again with the greatest ease.

To sum up, the glissières can replace with advantage the two springs of the printing frame, at the same time doing away with the latter, which is both cumbersome and expensive; whereas, as much as I could learn, the glissières can be obtained at a very cheap rate, and are light and easy to employ.

The same gentleman made another presentation—that of a rapid shutter, to be used in the centre of the lens. This shutter would not be worthy of notice, when compared with other sumptuous and excellent apparatus now in the market, if it were not that the instrument is easy and simple, so that amateurs and beginners can make it at home.

Diagram III.—A represents a round brass tube, having a slit in it nearly from top to bottom. In the interior of this tube is a piston, the rod of which is exterior and forms the obturator, having the shape of a

DIAGRAM III.

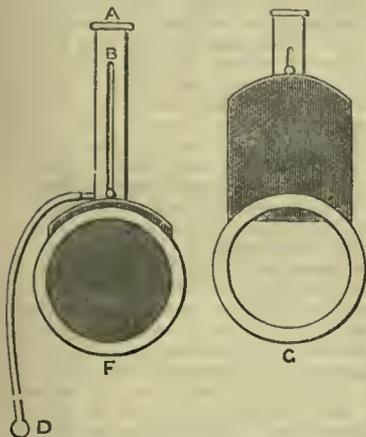
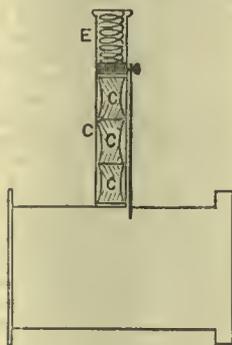


DIAGRAM IV.



diaphragm. The piston moves up and down this tube by two mechanical contrivances. Firstly: It is forced upwards by means of an indiarubber triplet bellows (see Diagram IV.). This bellows is inflated by means of an indiarubber ball, D. Secondly: The piston is forced downwards as soon as the hand of the operator ceases to squeeze the ball, by means of a thin steel spring placed in the top of the tube, E. F represents the obturator at rest; G shows the obturator fully open. A long or short exposure can be obtained at the will of the operator.

M. Colson, Capitaine du Génie, exhibited some very remarkable proofs obtained by him in a camera without the aid of a lens. He had a piece of brass perforated by a pinhole, and by the immission of the reflected rays from the landscape through this hole he gained a sharp and finely delineated view without any distortion whatever.

In making inquiries I learnt that Capitaine Colson exposed about two minutes; so that if the sensitiveness of plates continue in the same ratio as they have done within the last few years, we may hope sooner or later to discard that expensive auxiliary, the lens, from our studios.

A captain in the Spanish army exhibited a camera which he employs for photo-topographic purposes. A great discussion took place as to its advantages and its defects over other and similar instruments now in use.

M. le Comte Alberie du Chastel presented a modified stereoscope. This gentleman informed the Society that he had been struck with the unnatural appearance of stereoscopic pictures caused in a great measure, he said, by the old-fashioned system of cutting them to a fixed size, which up to the present had been accepted as the best form for such

pictures. Generally, he said, the stereoscopic pictures are obtained on a half-plate, and when cut a large part of the foreground is thrown away as useless, and, said he, it was very natural to do so, as the perspective appears to be exaggerated in the extreme; but when the double view is put uncut into the stereoscope one would be surprised to see how that instrument would harmonise the lines and correct the faulty perspective. Several views were passed round, some cut to the ordinary size and others cut much longer. The general opinion was that a great advantage was gained by leaving more foreground to the stereoscopic proofs, and advised opticians to enlarge their apparatus so as to admit a larger slide.

M. Nadar presented Eastman's roller slide, and explained its working to the members.

M. Franck informed the Society that he had continued his experiments as to the value of common salt as an accelerator in the development of gelatino-bromide of silver plates, and was more and more an advocate for its employment. His attention was drawn to its use by THE BRITISH JOURNAL OF PHOTOGRAPHY announcing that it was a cure for frilling; in using it for this purpose he found that not only did it act well for this purpose, but that it had other qualities—that of being an accelerator. After having made several experiments himself, he requested M. Audra to repeat the same. M. Audra said he was perfectly convinced that sodium chloride was a powerful accelerator. M. Franck laid before the members several plates which had been exposed the same time, and of which some had been developed in the ordinary way with ferrous oxalate, the others with the addition of common salt. All those developed by the addition of the sodium chloride were well developed, full of detail, and dense. Those developed simply by the ferrous oxalate had only a shadow of a picture, although M. Franck said that they had been developed to the utmost to get out a full image.

A member said he had tried the method but without any similar result; he had used pure sodium chloride. The answer given was that perhaps a chemically pure salt was not so advantageous as the common salt, which contained, as every one knew, lime, magnesium, and other products, which might be the principal agents for this phenomenon.

M. Franck, after giving in *extenso* the history of the manufacture of salt upon the sea-coast of France, then counselled the member to try again with ordinary commercial salt.

M. Fabre exhibited a very nicely constructed instantaneous shutter—chronometric in its working, and having several advantages over that of Boca. It is much lighter, less liable to get out of repair, and above all much cheaper. It consists of a trap which rises, and which when it gets to a certain height lets another down as soon as the clockwork gets to a certain point.

Electric lighting of the sitter has made giant strides in Paris, where the light of Phœbus is completely replaced during the winter by the electric light with triple reflection. To M. Chary, the successor of M. Walery, is due the credit of this innovation. I need not enter into the description of this establishment; the interior decorations, the furniture, and the taste displayed are worthy of admiration, and make a little palace of this abode of art. M. Chary is no longer tributary to the orb of day; he can operate at any hour and at any moment. He no longer requires a glazed roof; portraits can be made by him in a cellar as well as in the best-lighted studio; he obtains with the electric light the same quality and the same perfection in the negative as if obtained with the sun's rays. I had the advantage to be present the other day, and can certify that all M. Chary claims for his modification of the electric light for portraiture is quite true. I will endeavour to give an idea of his working. The customer is introduced into a magnificent saloon lighted up by incandescent lamps; here the sitter's eyes become accustomed to the glare of the electric light. At a given moment a few of these incandescent lamps are extinguished, and a powerful arc lamp throws out its rays. This lamp is just behind the sitter, and whose portrait could be taken without his or her being aware of the change in the light had not the sitter been warned by the operator that the exposure had begun. The rays from the arc lamp—placed as I said behind the sitter—are reflected by screens upon the model, so as it were to inundate the latter with refulgent, but, at the same time, soft and genial rays.

M. Chary made the portrait of Madame Stebbing, and I send a copy to the Editors for the office of THE BRITISH JOURNAL OF PHOTOGRAPHY.* The proprietor showed me many portraits obtained by the electric light as modified by himself, and it would be impossible for the most experienced photographer to distinguish that they had been obtained by artificial light.

25, Rue des Apennins, Paris.

PROF. E. STEBBING.

RECONSTRUCTION OF THE NORTH LONDON AMATEUR PHOTOGRAPHIC ASSOCIATION.

To the Editors.

GENTLEMEN,—It has been decided to change the name of the North London Amateur Photographic Association to the "North London Photographic Society."

This Association, which had its origin in a very humble manner, has now grown far beyond the expectations of its promoters, and the members

* We have received the portrait. Thanks.—Eds.

consider that it is no longer wise to observe any exclusiveness in the admission of members. Therefore, believing that it will be mutually to the benefit of professional, amateur, and dealer, to have a general photographic debating society in the northern suburbs, have decided to throw open its doors and admit every one interested in the advancement of photography.

As it will be necessary to form new rules and to elect officers for the present year, an open meeting will be held at Myddelton Hall, Upper-street, Islington, on Tuesday, the 18th instant, at eight p.m., and any one wishing to join the Society in its reconstructed form is invited to attend and take part in the business of the evening.—I am, yours, &c.,

H. M. SMITH, *Hon. Secretary N.L.A.P.A.*

5, Beatrice-road, Stroud Green, N.

THE COUNCIL OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

To the EDITORS.

GENTLEMEN,—The record of the attendances of the members of Council of the Photographic Society of Great Britain at the Council meetings during the past year, as published in the December number of the *Photographic Journal*, should be carefully studied by the members, and especially the country members of the Society; and as the matter is, or should be, of some importance not only to the members themselves but to all who are interested in the Society, being in fact as well as in name the "Parent Society," I venture to ask space for the insertion of the list, rearranged, but not altered, and for a few remarks thereon.

OF A POSSIBLE EIGHT ATTENDANCES.

*The President attended	8	Abney, W. de W., attended	4
Davis, T. S. "	8	Cobb, W. "	4
*Bird, W. S. "	7	Spiller, J. "	3
*Donkin, W. F. "	7	Cadett, J. "	2
Bedford, W. "	7	*Robinson, H. P. "	1
*Bolas, T. "	7	*Bedford, F. "	1
Blanchard, V. "	6	*Bolton, W. B. "	none
England, W. "	5	*Mayall, J. E. "	"
Gowan, A. "	5	*Paget, J. "	"
Warnerke, L. "	5	*Wortley, H. Stuart "	"

OF A POSSIBLE SIX ATTENDANCES.

Addenbrooke, G. L. "	5	Wood, H. TRUMER "	4
Emerson, P. H. "	2		

Retiring members are marked *.

It is gratifying that the veteran President has been blessed with sufficient health, and animated with sufficient zeal, to take one of the first places, and it is equally satisfactory to find that the Hon. Secretary and the Hon. Treasurer are only one step behind. Among the retiring members of the Council Mr. T. Bolas, with a creditable record of seven attendances, takes a very conspicuous place, the rest sharing with the retiring Vice-President the unenviable distinction of being absolutely at the bottom of the list.

Of course it is possible that these gentlemen, who have so utterly failed during the past year to perform the duties which they undertook on their election, may not have wilfully neglected those duties, but may have been prevented from their due performance by illness or unavoidable circumstances; but whichever way the matter is looked at, it is impossible to have a stronger argument against the continuance of the obsolete and absurd rule under which members of Council are elected, for better or for worse, practically for three years. At the time the present rules of the Society were passed there might have been some argument, although, even taking into consideration the then existing circumstances, it is hardly possible to conjecture what this could have been, in favour of this rule; but at the present time there is absolutely nothing to be said for it, but a great deal against it. It is manifestly unfair and inexpedient to saddle any one with a responsibility which is unnecessarily made to last until the year after next. The system, too, prevents that healthy interest, among the ordinary members of the Society, in the election of officers which would attach to a general election, with the result that, on the annual occurrence of six or seven vacancies, those to which retiring members are not re-elected are filled up by nominees of the Council, and the Council thus indirectly becomes a self-electing body. The consequence of this, the present state of affairs, is that, being practically beyond the reach of, and resenting any criticism from without, the Council institute no measure of reform and, as a body, oppose suggestions for any such, however much needed, as a possible step towards the curtailment of their self-assumed prerogative of absolute government.

It is hardly beyond the actual fact to say that the Society is entirely indebted to its annual exhibition for the apparent prosperity it enjoys. This exhibition, in spite of the adverse criticisms upon its management which have appeared in your JOURNAL and others, is on the whole far better conducted than might be expected; but, unfortunately, the undertaking seems utterly to exhaust the powers of the executive for the rest of the year, for in all other matters the Society is far behind even the little Society of my own county, and in the interest and importance of the matters brought forward at its meetings, and the manner of discussing the same, is immeasurably behind more than one of the other London Societies which I have had the privilege of visiting.—I am, yours, &c.,

January 8, 1887.

A COUNTRY MEMBER.

TOURISTS' CLUB.

To the EDITORS.

GENTLEMEN,—As many amateur photographers seem desirous of securing the benefits of a tourists' club, the Committee for managing the affairs of the Pedestrian and General Tourists' Club have had under their consideration the practicability of obtaining for amateur photographers the particular conveniences which they find necessary for their work when making photographing tours. The Committee are quite willing to do their best to make these arrangements for amateur photographers who may join the Pedestrian and General Tourists' Club if the number of such members is sufficient to cover the expenses necessarily incurred in making the arrangements.

I am not myself a photographer, but with the assistance of any suggestions which you, Gentlemen, or any of your correspondents, may make, and the valued co-operation of Mr. H. A. Hood Daniel, of Bristol, who has kindly undertaken to assist me, I do not fear being able to make perfectly satisfactory arrangements.—I am, yours, &c.,

H. COPE WEST, *Hon. Secretary Pedestrian and*

39, Hamilton-square, Birkenhead.

General Tourists' Club.

PERMANENCE OF PRINTS.

To the EDITORS.

GENTLEMEN,—An important article appears in your last number bearing the signature of A. Pringle. Its primary object would appear to be to discredit platinotype, and thereby to annoy its great champion, Mr. H. Berkeley. I feel sure that the introduction of a personal element into scientific discussions such as these is condemned by the great majority of your readers, and looked upon by them as a great waste of valuable space.

Having therefore entered a protest against the spirit in which the controversy has been carried on, I will ask leave to make a few remarks on what is the practical outcome of Mr. Pringle's last communication. Whatever effect it may have on the future of platinotype printing I will leave aside, as I am sure Mr. Berkeley will have something to say on this matter, but with regard to developed gelatino-bromide prints I fear it has given the now favourite process a blow from which it will scarcely recover.

To find that prints which seemed to possess so many reasons to make us hope they were permanent are considerably injured by the action of sulphuretted hydrogen, is certainly a fact to shake our faith in their permanency, but if, as I understand, the yellowness affects the whole surface of the print, I fear the process is reduced to exactly the same level as printing on albumenised paper. This yellowness is a clear proof that there remains in the gelatine film or in the paper itself some silver compound of whose nature we are still in complete ignorance, and which is not, as supposed by some, an *albuminate of silver*. There should remain in the whites of the picture nothing but the gelatine film that held the salt of silver. The moment a salt insoluble in the fixing solution remains the chances of permanency become very doubtful, and I therefore consider the yellowing of the whites of a picture a far more dangerous symptom than a change of colour in the substance forming the image.

Unfortunately from Mr. Pringle's experiments, it appears that it is when the finished prints have the *purest whites* that they contain the most certain germs of future destruction. I feel doubly sorry for these results, as it must seriously affect the position of our paper negatives, which, of course, must share the fate of positives by the same process. One can scarcely see that any amount of care or washing can ensure us against the *danger of fading* any more than with albumenised prints.

I regret that Mr. Pringle did not submit to the same test an ordinary engraving on white paper. This would have made it certain that the cause of fading was not in the paper itself. The fault could then be easily remedied, as the fine engravings in the illustrated annuals of forty years ago are still as fresh as ever, proving that pure paper can be had.

Perhaps, however, after all, the failure of a process on which we were beginning to count too much may serve as a fresh encouragement to clever brains to seek out some perfect printing process that will give a chance of longevity to the products of our now nearly perfect negatives.—I am, yours, &c.,

GEORGE MANSFIELD.

Naas.

To the EDITORS.

GENTLEMEN,—Mr. Pringle's paper on *Sulphuration of Bromide and Platinum Prints* is, if not quite conclusive evidence against the latter, at least comforting to workers on bromide (especially for enlargements), as it appears to be as reasonably permanent as any other process we have, and, to amateurs at least, is so convenient, in consequence of the possibility of using it by gaslight for printing from our negatives on winter evenings.

But there is another test of the two papers which, though of a slower and less violent kind, tells in the opposite direction to Mr. Pringle's conclusion.

If bromide and platinotype prints (unmounted) are put side by side into the same "showcase" in the way that unmounted prints are frequently exhibited, namely, with their corners tucked into slits cut into the paper

behind to hold them in position, and left there for a few weeks' exposure to daylight in a shop window, it will be found that the bromide prints will be considerably faded, with the exception of the hidden corners, whilst the platinotypes will remain unaltered. It may not always be so, and I hope it may be proved to be avoidable by very careful washing; but that is so like the treatment that many photographs have to undergo that it may be accepted as a practical test of permanency quite as thorough as immersion in sulphuretted hydrogen, which, though very severe, seems a satisfactory test where the prints stand it scathless.

The rich black tone of bromide paper prints, which is satisfactory in portraiture, especially in large heads, is somewhat dull and sombre for landscape pictures, and I, for one, do not understand why two bromide papers (like, for instance, Eastman's and the "Alpha" papers) should yield such totally different tints under the same developer.

Would you, gentlemen, kindly give us an article at your early convenience and explain *chemically* why a prolonged exposure and a weak developer will give a rich sepia brown tint on Alpha paper, whilst a shorter exposure and a strong developer produce the same black tone as bromide paper gives, and which seems not to be amenable to the same treatment for variation of tint?

The tint of your illustration in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC this year is so artistic, and reminds one so much of a fine sepia drawing, that it has made me desirous of adopting such paper and process for future landscape work, and possibly many other amateurs may form the same idea, and it would be a source of great satisfaction to learn "the reason why" such a great variation of tint is obtainable in its chemical bearings, so that we may proceed to work with more certainty and confidence, and I think it is a question which has not yet been fully explained in the photographic journals.

Will Mr. Pringle also tackle the Alpha paper prints as well as the bromide ones in his future experiments, and give us the result? as they are a branch of the same bromide development process, equally worthy of being tested.

Our old preceptors in photography—Mr. Sutton amongst others—always taught us that *developed prints* must be more permanent than printed out chloride ones, and therefore, I presume, few persons will be prepared to suppose that our old friend albumenised chloride paper can possibly stand so severe a test of permanency as any developed silver process, be it bromide, Alpha, or (the supposed absolutely permanent) platinotype.

Let us hope that the fight which is sure to follow Mr. Pringle's opening cannonade will settle the question which is the more permanent process now extant.—I am, yours, &c.,

"Lux."

ON PROCESSES AND PERMANENCY—A REPLY.

To the EDITORS.

GENTLEMEN,—In reference to the correspondence which is proceeding, it appears to me that the two quite distinct questions, the permanency of the image and the unalterability of the support, form separate objects for discussion.

It is absolutely certain that if the image dies out, or "fades," or changes into one of two or more tints, the result must be disastrous and by no means pleasing; but if the *paper only* changes slightly in tint, the result may be borne with more equanimity. Indeed, as the "toning" of an engraving by "age" is generally considered by connoisseurs to be an advantage, one might put forward a similar plea for other pictures, somewhat engraving-like, when they too, by "age," have acquired "a tone."

But—to pass from generalities to platinotype—I do not think any papers, as such, now used have better capabilities for remaining white than the platinotype paper has. It, too, is "specially made" for the Company—if that is any advantage in this direction. As regards papers, "they all do it"—discolour more or less. If, however, a print, by whatever process made, is not properly cleared of the substances which have rendered it sensitive to light, the whiteness of the paper basis must suffer: if a carbon print contains traces of bichromate, it becomes greenish yellow, and if one of Mr. W. H. Walker's prints is not properly "fixed" he can tell you what will happen to it.

It has been a great difficulty to the Platinotype Company, owing, I suppose, partly to the great general ease with which the process is carried out and to its apparent simplicity, to induce workers to properly carry out the clearing of the prints. As the prints *look white*, perhaps, even on leaving the potassium oxalate, and certainly soon after being put into the "first" acid bath, some suppose that all the sensitiser is at this stage removed. A moment's thought will show that it is dislodged only, not entirely removed. One cannot wash thoroughly in dirty water; and if the acid bath contains sensitisers, so must the body of the print—a trace only, perhaps, but yet maybe enough to impair the purity of the whites.

The subsequent washing in plain water has not the efficacy of the acid baths. So, no matter how many baths are used, if they are not progressively clean—each fresher than the former—a complete removal of the salts is not to be looked for.

No doubt some platinotypes which are now impure in the "whites" have been turned out, but proper care would with ease have avoided the

calamity; the conditions of this form of permanency are known, if not, are readily ascertainable. But, even then, mind that only the paper basis has altered in tint; the images are as full and true in colour as ever they were.

All we can hope for from any "permanent" process is that the prints shall be in behaviour like engravings, *provided* the conditions for permanency, which are *known*, are carried out.

Having found common German collotypes taken to be platinotypes, and knowing that not a few confuse the bromide prints with platinotype, I should be quite prepared to hear *anything* as to the behaviour of the latter, but before I believed it I should require to see the print to which allusion was made. I do not allude to Mr. Walker's statement, as I have often called attention myself to the need for proper "clearing" of the prints, and not an *apparent* clearing only. It must also be remembered that the Platinotype Company do not make all the paper on which platinotype prints are made.

If the prints are "yellow from the very day of their creation," as stated by Mr. Walker, all I can say is, either they have not been cleared at all, or else the prints have been made upon decomposed and very badly kept or treated paper. This kind of statement is just another of the "red herring" variety which is continually being dragged across the scent.* The points of value in a permanent process are these: that it shall be *easy*, by the carrying out of *well-known* conditions, to turn out *any number* of prints the permanency of which the producer can *guarantee*.

The "definition" of Mr. Dunmore, which Mr. Walker quotes, is "admirable," if I read it aright; I had myself put forward a similar view. When Mr. Walker has furnished better proof that the "image he has set up" neither will partially disappear nor change in tint, either *before* or *after* the paper alters (as he admits it must alter) in tone, in fact, will remain intact so long as the paper is firm and presentable, he will have established upon a sounder basis the contention at which, I presume, he aims.

Must I inform Mr. Walker, and, it seems, Mr. Dunmore also, that there is no necessity for "completely," or even partially, "destroying the paper support" when testing with the solutions, &c.?—"violent tests" I alluded to. I believe that an albumen surface would be particularly resistant, and I know plain paper is quite sufficiently so. Gelatinised paper if "chrome alumed" would no doubt stand any sufficiently strong solutions. I call on no one to apply tests which will destroy the paper; the object is to find out whether the image is as permanent as the paper, and, if not, what degree of stability is likely to be secured.

The value of these tests to one who wishes to prove, at an *early stage*, the permanency of his prints, is due to the knowledge that if a print can withstand more or less concentrated solutions and gases, it must naturally also withstand the same substances when brought to bear in extremely attenuated condition, as in the air, through a period of *many years*.

I say that the evidence is very valuable to an inventor, and may add that Mr. Willis was careful to so test his prints on first producing them, and long before the date of Mr. John Spiller's well-known experiments on them. Mr. Willis wished to convince, and to *convince at once*, without waiting, just as some others are now wishing. It did not take long to convince me of the value of the process in this respect. But "we have changed all that" now, and permanency is to be taken "on faith," just as is the honesty of one's neighbour!

Naturally the bromide paper manufacturers would not seek to raise this controversy—I am quite with Mr. Walker there—but the action they have taken naturally gave rise to it. Is it in human nature to take things quietly when we find others claiming, and in some cases securing off hand, without proof, the hard-earned and well-earned reputation of other processes which have had to *demonstrate* the truth of their claim?

Where would have been the value of the Platinotype Company's claim several years ago—at the "outset"—had it not been able to point to (1) the great stability of platinum, and to (2) the unalterability of the prints in solutions most damaging to silver prints of all kinds? And what would have been the inference had platinum rings, coins, and spatulas been subject to tarnishing or to chemical change? Does Mr. A. Pringle, for instance, think there would have been found no "analogy" had such been the case?

The facts as they stand had been used by outsiders as "analogy" favourable to platinotype; logically, therefore, I presume the inclination would have been adverse if facts had been the other way. It will not do to reject or to accept a class of evidence just as it may clash with or fit in with our object.

And why this opportunism? The reason of it is this, that while the one process is *private* property the others are *public* property. Further into the mystery I need not go.

HERBERT B. BERKELEY.

(To be continued.)

RECEIVED TOO LATE FOR ALMANAC.—Committee of Geneva Photographic Society for 1887:—President: H. F. Boissonnas.—Vice-Presidents: E. Sautter and E. Fatio.

* If Mr. Walker's paper were exposed by mistake, or otherwise, over the whole surface to light and then printed under a negative and developed, would not the result be a black sheet, and not even a "yellow" one? The moral is obvious.

Exchange Column.

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

- I will exchange a Ross' No. 3 portrait and a Ross' No. 1 universal for a Voigtlander's No. 5 Enryscope.—Address, W. DAKIN, 1, High-street, Sheffield.
- Wanted, whole-plate view lens or lens and camera in exchange for fifty-two-inch bicycle.—Address, RIDLINTON, Photographer, Wynn-street, Birmingham.
- I will exchange a splendid interior background by Seavey, new last season, for one ditto by the same maker.—Address, E. KELLEY, 31, Old Town-street, Plymouth.
- A large artificial rock and rustic wood accessories for exchange, comprising Seavey's see-saw complete, steps, stiles, table, chair, &c. Photographs of same on application.—Address, W. W. WINTER, Derby.
- Wanted, a good whole-plate rapid doublet; exchange, magic lantern, four-inch condensers, complete in case, with comic and other slides, equal to new.—Address, COUCH, 6, Berkeley-street, Piccadilly, London, W.
- Wanted, a tricycle in exchange for the following articles:—Half-plate camera, whole-plate lens, carte rolling machine, Ross' 5x4 view lens, and other articles.—Address, MYLES GARNER, 298, Holloway-road, London, N.
- Wanted, studio camera, to take two C.-D.-V. on one plate, with extra repeating back, in exchange for Sykes's hydrometer. Difference adjusted.—Address, E. GREETHAM, Photographer, 65, London-road, Stoke-on-Trent.
- Will exchange half-plate tourist camera, swing back, rack adjustment, two fronts, and three double dark slides, book form, with carriers for quarter-plates, for 10x8 rectilinear type of lens by any good maker.—Address, J. W. C., 162, Carr-road, Sheffield.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

- G. M. J.—The shutter in question was shown by Mr. Place.
- DEVONIA.—We have heard nothing of the Company named for a long time past.
- W. E. A. D.—Better procure Mr. Wilkinson's work. It may be had through any stock dealer.
- A. H. (Montreal).—Until you see further announcements in the editorial columns, it may be well not to decide on making any change.
- J. E. HOMES.—By sheets of ebony we presume you mean ebonite. If the latter, it may be obtained from the Indiarubber, Guttapercha, and Telegraph Works Company, Cannon-street, E.C.
- C. I. S. B.—No work devoted to the subject is published in this country. The nearest to it is Mr. Wilkinson's book, which may be obtained through any of the dealers in photographic materials. The price is five shillings.
- PORTABLE asks if any one can inform him the best photographic paper published in the French language, and the price. Also, how marks made with a copying-ink pencil on a negative can be removed without injury to the latter.
- A. C. K.—Your failure can only be accounted for by excessive under exposure. No doubt at the time the exposures were made the light was of an exceptionally non-actinic character. With more rapid plates you would probably have secured good negatives.
- I. PETERS.—The trouble arises from the emulsion being foggy—something in its preparation. Possibly it has been over cooked. The cold slab will not account for the plates fogging. If the fogging does not proceed from the emulsion then the plates must have been exposed to light.
- F. L. FISHER.—1. So far as we are aware there will be no infringement of patent if you employ the shutter.—2. Either A or B will answer the purpose better than C, if the time of exposure be an object. A lens of the smaller carte-de-visite type would perhaps cover the plate better when working with the fall opening than any of the others, but either of the first two named will do very well.
- A. C. B.—You are correctly informed, and have clearly rendered yourself liable to a penalty. Section 105 of the Patent, Designs, and Trade Marks Act, 1883, enacts that "Any person who represents that any article sold by him is a patented article when no patent has been granted for the same, or describes any design or trade mark applied to any article sold by him as registered which is not so, shall be liable for every offence, on summary conviction, to a fine not exceeding five pounds."
- G. D. H.—If the gold has not been exhausted by toning it has become reduced by some means or other. It is clear that the bath was made far stronger than necessary in the first instance. Fifteen grains of gold in a toning bath of fifteen ounces is a great deal too much; such a bath, if in active condition, would be unmanageable. Your proposed plan of keeping the gold in solution and only adding it to the bath as required will be the best; but in the case of the acetate bath it should be added the day before using and not at the time,

S. W. LEFEVRE asks whether, in working up enlargements in monochrome, oil or water colour is employed, and, if the latter, what is used to make the colour flow easily?—As a rule water colour is used in finishing pictures in monochrome. If the picture be washed over with a little dilute ox-gall the colour will then take freely. Prepared ox-gall suited to the purpose may be obtained at any artists' material dealers. No difficulty need be experienced in obtaining soft vignettes, provided the mask be kept moving during the exposure. Probably the movement has hitherto not been sufficient.

HYP0 writes: "For the past few years myself and assistants have taken a great number of views of buildings and other places of local interest, and had a good sale for them; lately another photographer has copied several of them and is selling the copies at a cheaper rate. We would be glad if you could let us know if we were to register them now could we take an action against the photographer for copying and against any other parties for selling them."—It is of no use whatever to register the pictures after they have been published. To secure a copyright the pictures must be registered before any copies are sold. This has often been explained in these columns of late.

E. G. RAWLINGS says: "Being desirous of trying my hand at painting backgrounds in distemper and flat painting, will you kindly give me the necessary information—1. What canvas is used, where bought, and price for the large size (eight feet by eight feet).—2. How to treat the canvas.—3. What colours are employed, and what medium, or what quantities of oil and turpentine?"—In reply: 1. Unbleached sheeting, which may be had at any draper's, is usually employed.—2. A preliminary coating of common size.—3. For distemper, lampblack and whiting with sufficient size to prevent it rubbing off when dry. For flattening, the background is painted over with oil paint of the colour desired and then flatted with a similar colour mixed with turpentine only.

J. A. W. DOLLAR writes: "Will you kindly answer the following questions in your next? I have a No. 2 portable symmetrical (Ross') four-inch equivalent focus and a Watson's nine-inch rapid rectilinear lens (both cover half-plate); I want to use the single lens of either combination as a landscape lens. Should the stop be placed in front of or behind the lens (or is it a matter of indifference)? and will the single lens work as large an aperture as the combination? I should also like to combine a lens of either combination so as to produce a lens of, say, six-inch focus. Will this be rectilinear, and is it likely to cover the plate as well as the original combinations with, say, $f/10$?"—In using either of the components as a single lens the stop should be placed in front, that is, next the concave side of the glass. The single lens will not work with so large an aperture as the complete combination. It will have to be stopped down to $f/15$ or $f/20$, probably, to get good definition all over the plate. The lenses of the two instruments may be combined, and will, no doubt, yield good results if a sufficiently small stop be employed—possibly a much smaller one than that mentioned. The lens will still be rectilinear if the stops be rightly placed, that is, somewhat nearer the shortest focus lens than the longest.

PHOTOGRAPHIC CLUB.—Owing to the exhibition meeting of this Club taking place on January 26, 1887, the lantern night will be held next Wednesday, January 19, 1887. The discussion will be on lantern matters. Visitors are invited.

We have received from Mr. Joseph Gray, Newcastle-on-Tyne, two specimens of his new positives. They are a new departure, the credit of which is claimed by Mr. Gray. They are made by a modification of the ferrotype emulsion. When we have an opportunity to try such plates for ourselves we shall have more to say concerning them.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—We have received an attractive programme of proceedings of this Society for the next few weeks. From this we learn that the meeting of next week will be devoted largely to a display of optical apparatus of various kinds, and that ladies are invited to attend on that occasion. Proceedings are to commence at half-past seven p.m.

At a recent meeting of the Royal Microscopical Society, Mr. John Mayall, jun., exhibited and described a new form of heliostat (made by Mr. Hilger) for use in solar photomicrography. The pencil of sunlight reflected from the first mirror could, by means of the second, be directed in any desired direction, affording to the worker the very great advantage of being able to place his microscope and camera in any position he pleased.

RELIC OF THE SEA.—A photograph was washed up at Portcawl, South Wales, and it appears to have been taken at the Park Studio, Trannere, by Mr. W. Marshall. The photograph is of a lady, with a small child in her arms; on her right is a boy about nine years, in front of him is a little girl with a pot of flowers at her feet; on the left is another girl, leaning her head on the lady's shoulder, and having a doll in her arms. In front of her, sitting down, is a smaller boy. The photograph is lodged with the Receiver of Wrecks, Custom-house, Swansea, and no doubt on application would be given up to the family interested in the relic.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1394. VOL. XXXIV.—JANUARY 21, 1887.

BINOCULAR CAMERAS—IMPROVEMENTS WHICH ARE NOT IMPROVEMENTS.

SOME extraordinary fallacies seem to prevail with regard to making photographs so that they shall have what is known as relief, or stand out with stereoscopic effect.

It has long been a favourite idea with some that if two pictures, taken from standpoints a few inches apart, were obtained, a stereoscopic effect would be produced by superposing these images upon one sheet of paper. We say that this has long been an idea. So long ago as 1853 stereoscopic views of statuary in the Louvre were projected upon a screen by a pair of lanterns in the Polytechnic Institution, one on the top of the other, so to speak, it being imagined that the resulting picture would be stereoscopic. Never was there a greater mistake. The principle of stereoscopic photography lies in there being two dissimilar views of an object, which being viewed, one by each eye, are brought into coalescence by the brain of the observer.

We are led to make these remarks in consequence of a specification of a patent which we published last week, and which will be found on page 26. The principle of the invention there patented consists in blending together on a negative the two images obtained by the employment of a binocular camera. This is effected by a variety of methods, one of which is to bend the rays to a centre common to both lenses by prisms placed behind them. But whatever be the means employed, it is the principle to which we now direct attention. We need not go very deeply even into principles, a single application will suffice. Let us suppose the subject to be a portrait, in which the nose and ears are seen, and that this portrait is taken by a binocular camera, as described in the patent. In one of the images the ear will be at a greater distance from the nose than in the other. Now on what principle are these two dissimilar pictures to be superposed? If the points of the noses be made to coalesce, then shall we have two ears at either side, one situated a slight distance from the other? or if the ears or ear be combined, then shall we have two noses? This applies also to landscapes, in which we must have either a duplication of the prominent objects in the foreground or of those in the distance.

We never willingly throw cold water upon any patent, still in this case we think it will be an act of kindness to the patentees (by dissuading them from incurring expense in carrying their idea into practical shape) to say that the same, or a similar system of attempting to combine dissimilar photographs, was patented in 1865, during which year the subject was brought before the London Photographic Society, with results which it was easy to have foreseen.

The photographs at that time attempted to be produced

were, by the inventor, termed "binographs," and, like those now under consideration, were based upon a complete misapprehension, alike unsound in principle and impossible in practice. It was shown long ago that the principle of the stereoscope is the superposition and union of two images *in the brain*, and not upon a plane surface. If two images are taken which, in the brain, will unite and form an appearance of solidity, and if these are projected upon a screen, they will never produce a stereoscopic illusion; for this reason, that in looking upon the screen each eye looks upon the same, and not upon a different picture, whereas in nature each eye looks upon a different view.

We are compelled, with reference to any invention of this nature, to repeat what we said twenty-two years ago concerning the binographic invention of that period: historically, it is not new; theoretically, it is not sound; and practically, it is not good.

GELATINO-CHLORIDE PAPER.

CHAPTER II.

AMONGST risks of this class the most prominent one is the retentive nature of the gelatine film, familiar to all workers of gelatine dry plates. What matters it that gelatine is practically free from sulphur originally, if that substance, in the form of sulphide or thiosulphate of silver, be left in the film through careless washing? We all know how difficult it is, and how important, to entirely free the negative film from hypo and its compounds; how much more necessary must it be, in the interests of permanency, to remove such compounds from the delicate positive image upon paper? Then, again, we must look at the difference between a film of coagulated albumen and one of gelatine. The former, under ordinary circumstances of treatment, is about as hardy and unchangeable a substance as we can well desire; but the latter, even when heavily chrome alumed, is liable to physical changes from damp, which may seriously jeopardise the stability of the image. Still, as we have pointed out, these are questions which hinge rather upon the care and integrity of the operator than on any inherent defect in the process itself.

Before proceeding to the details of working this new paper, we may briefly describe the physical characteristics of the commercial article as we have found it. In appearance it resembles a sample of highly albumenised paper, though on closer examination it is found to be heavier both as regards the paper itself as well as the glossy surface. It is tinted of various shades in the same manner as albumenised paper, to resemble which as closely as possible has evidently been the object, and the result has been successful to a degree.

Here the physical resemblance ends, for if we immerse a strip of the paper in warm water much of the gloss disappears and the water becomes milky; the layer of sensitive emulsion is, in fact, perfectly soluble, a fact which must be constantly borne in mind, since it entirely precludes the possibility of using warm solutions either for toning or fixing, or the application of heat in drying the prints. They must, in fact, be as carefully treated while wet as a gelatine negative, and this in the eyes of many will appear as a disadvantage. From the character of the surface, too, it is clear that the practice of drying the prints between bibulous paper cannot be as freely adopted as it is with albumen paper, or if it be it must be with the utmost precaution.

Beneath the sensitive layer we find an artificial surface composed of insoluble gelatine combined with a white pigment; it is to this "facing" that the paper owes its high gloss, and not apparently to the employment of an emulsion rich in gelatine. It also contributes to the brilliancy of the image by keeping it entirely on the surface, so much so, in fact, that if a strong print be immersed in warm water until the gelatine is thoroughly dissolved only the faintest trace of the picture remains.

If we test the paper chemically by digesting it in cold water, we shall find that it contains but the merest trace of free silver—that is, silver in the soluble state, whether it be nitrate or some organic compound. It is also comparatively free from acidity, differing in both these respects very remarkably from "ready sensitised" albumenised paper, which, however, in other respects it closely resembles.

As regards the keeping quality of the gelatine paper, we are informed that it is very good. During the time we have had the opportunity of testing it, extending over several weeks, without even the precaution of storing it in an air-tight case, it has retained not only its whiteness but also its printing and toning qualities perfectly, whereas sensitised albumen paper kept under similar conditions has become discoloured and almost entirely lost the power of toning. It has, we are told, been kept for over six months, and has performed a trip from Germany to America and back without showing any deterioration. In a parcel of cut sheets which we opened a few days ago we noticed a very faint discoloration at the extreme edges, but as the edges were in contact with a brown-paper envelope it is possibly the chemical action of the latter that caused the change.

We shall next week speak of the manipulation of the new paper.

A NEW LONDON PHOTOGRAPHIC SOCIETY.

IN view of the rumoured intended dissolution of the South London Photographic Society and in light of the fact of a new North London Society having been formed, the Gallic phrase—"The King is dead: Long live the King!" is very apt to be suggested. But the venerable "South" is not yet defunct, however soon such an undesirable event may happen.

It is, however, an undoubted fact that a new North London Society has this week been formed, and under auspices which appear to be eminently favourable to great success. Myddelton Hall on Tuesday evening, and in response to an invitation which appeared in our issue of last week, was well filled by amateurs, professionals, and manufacturers, whose places of residence are situated in the northern portion of our overgrown Metropolis; the large attendance, especially taking into consideration the inclemency of the weather and the dense fog

prevailing at the time by which travelling was seriously impeded, evincing the interest felt in the movement. Particulars as to the constitution of the newly-formed Society will be found on another page, to which those interested are referred.

Many years ago a North London Society of great excellence used to meet in the same Hall, usually under the Chairmanship of Mr. George Shadbolt, our venerated predecessor in the editorial chair of this JOURNAL, although Mr. C. Woodward, F.R.S., was Honorary President. In course of time it became defunct, an event all the more remarkable when it is considered that at the time of its demise there were over a hundred names on its list of members, and its funds were in a most satisfactory condition. But, as we said last week, it died of inanition.

For many years there was no photographic society in the north side of London; but, about a year ago, a Society, purely amateur, was formed and carried on in the same Hall so well associated with photographic progress a quarter of a century ago, and, during the past year, this young Society has most ably "held the fort." Believing, however, that the time has arrived when it might be reorganized with advantage, and on a broader basis, this Society has undergone a process of entire reconstruction, in virtue of which professionals and the trade generally, as well as amateurs, form the *personnel*.

The meetings will be conducted on lines akin to those by which the other London Photographic Societies are characterised, namely, technical evenings, alternating, as far as possible, with those of a more formal nature. The social element—evinced by the features of club life indulged in during its *séances*—is to be duly recognised by the members, many of whom are well known as active members of the kindred Societies in town. The meetings take place on the first and third Tuesday in each month, by which the second and fourth Tuesdays are left disengaged for attendance at the Photographic Society of Great Britain.

WILLESDEN PAPER AND ITS APPLICATIONS IN PHOTOGRAPHY.

"WHAT is Willesden paper, and is it of any utility in photography?" is a question which has frequently been replied to in our Correspondence columns. This material, as the majority of our readers are aware, is by no means a new one, though with a view to seeing the latest applications of it, and how they may be utilised in photography, we have recently visited its manufactory.

Willesden paper, it may be explained, takes its name from the place where it is produced. In a word, it is ordinary paper treated with an ammoniacal solution of copper, which renders it waterproof. The paper generally employed for the purpose is one of a coarse and tough character, such as that made from rope; though paper of the finest quality—writing paper for example—is equally amenable to the Willesden treatment. The "paper" is made of various thicknesses, from that of ordinary writing paper to that of stout millboard, and of different widths up to fifty-four or fifty-six inches. The thicker kinds are built up of several layers of paper, as is the case with cardboard. That designated "one-ply" is one thickness only; two-ply, two; and so on—eight-ply being the thickest made. This is composed of eight thicknesses, and is about the sixteenth of an inch thick or rather more so.

In the manufacture of ordinary cardboard the different sheets of paper composing it are cemented singly one upon

another, until the requisite thickness is obtained. In the manufacture of thick Willesden paper a different plan is adopted. Thus, if a four-ply substance be desired, a couple of two-ply pieces are secured—"welded" as it is technically termed—together; and if an eight-ply, then two four-ply thicknesses are similarly dealt with. In the welding process the material is again treated with the copper solution, which further increases its waterproof character. Although Willesden paper is waterproof, in the general acceptance of the term, it is not really unaffected by moisture, inasmuch as when it is long subjected to it, it expands like ordinary paper, though to a far less extent. With this explanation of the manufacture and characteristics of the material, we shall indicate some of its applications.

One of the principal uses of the paper is as a substitute for sheet zinc, iron, or wood, for building purposes. At the works we were shown several buildings roofed with the paper, and others with both paper sides and roofs, which appeared to be perfectly weather-tight, although they had been standing for several years. For these buildings the four-ply paper was employed. We also saw some water tanks and drinking troughs for cattle which had been made for similar periods. These were simply frameworks of wood lined with the four-ply paper. A model tank was shown us; it was composed of a light wooden framework lined with a single sheet of thin paper, and had been holding water for more than a year, and was still dry on the outside. From this brief description of its uses it will be seen that there are many purposes connected with photography to which Willesden paper may be applied. For example, in the construction of a portable studio, both for the roof and sides, it would be very useful, being lighter and more easily fixed and removed than either zinc, galvanised iron, or wood; and, when the building is taken down, the paper can be rolled up and stored away, it will then occupy but little space. It can, of course, be painted, which will improve its appearance and at the same time add to its durability. It may be mentioned that the panels in the grand entrance hall of the late Exhibitions at South Kensington, on which were the large allegorical paintings, were of Willesden paper.

One purpose to which we have seen the material applied is in the construction of a drying closet for gelatine plates, and it answered admirably; while it was so light that it could easily be transferred from one room to another. It was simply a light framework of wood covered with the four-ply paper. The paper is also used as a lining for damp walls and roofs—things not unknown in some photographic studios. A very useful application of this material which we can see, is that of backing framed photographs which have to be suspended on damp walls, as is frequently the case at exhibitions. For protecting the backs of outside showcases and frames at railway stations, and other exposed situations, it ought to prove exceedingly advantageous.

Another very useful photographic application of Willesden paper is that of extemporising vessels for water or solutions, when travelling in foreign parts or in out-of-the-way places. A common packing case, or box, can in a few minutes be converted into a serviceable water tank by lining it with a piece of the paper simply folded to shape. When such an extemporised tank has been soaked for a few hours, and then rinsed out, it may, we are assured, be used for containing water for drinking purposes. Hence, after similar treatment, it may assumably be employed for water for all photographic requirements. A sheet of the paper folded as a tray, with the corners

held together with American clips, may be extemporised as a developing or fixing dish for negatives *en route*. It may also be employed as an economical means of constructing photographic trays of a more durable kind. For this purpose the four or eight-ply variety should be chosen, and, to facilitate the bending, the paper should be previously soaked for an hour or two in water, because if the thicker kinds be bent at a sharp angle when perfectly dry they are liable to crack, but not so after moistening. In this application the corners should be secured with marine glue, and if the vessels be coated on the inside with shellac varnish, or Brunswick black, they may be used for silver solutions. Indeed, one of the most—out of the many—useful applications of Willesden paper in photography, is the case with which vessels, say of out-of-the-way sizes, which may only be required on one or two special occasions, may be constructed.

A NOTE in the *Chemical News* by Dr. Levoir, of Delft, describes a modification of the mixed-air gas-burner, which he states to have the advantage of diminished height compared with ordinary forms, besides providing for better admixture of air than usual. He makes the gas outlet conical in form, and very thin and sharp, so adopting Gifford's principle. He explains the objectionable luminosity to be seen in ordinary combustion furnace lamps as being due to the current of gas following one side of the tube, and passing unmixed with air, as a ribbon, through the tube. He, however, admits that his new lamps are not quiet during action, as when burning they make a noise like some forms of burners by another maker whose name he quotes.

It is not generally known that the manufacture of bichromate of potash was the outcome of a process of dyeing, and a very interesting account of its introduction will be found in *The Life and Labours of John Mercer, F.R.S.*, who has been called the Palissy of calico-printing. It is one of the standard quotations of the photographic historian that in the early days of photography "hypo" cost as much per ounce as it now does per hundredweight, and the same may almost be said of bichromate of potash, for when the late chemist above referred to introduced the use of chromium into dyeing, the price of the salt was half-a-guinea an ounce; but the requirements of the new dyeing operations caused a demand to spring up, and the salt is produced in hundreds of tons, and at a price which is well known to all our readers.

A WRITER in the *English Mechanic* states that the addition of ordinary kitchen salt is a great advantage to the usual oxygen mixture, as it enables the evolution of the gas to be controlled with the utmost nicety. As is well known, some experience is required in making gas in the ordinary way, in order to avoid sudden rushes or as sudden stoppages, in the emission of the oxygen. The writer in question gives the proportions (by weight), eight parts of chlorate of potash, two of ordinary black oxide of manganese, and one and a half of kitchen salt, the whole being well mixed, as being suitable, and says that the gas ceases to come off the moment the source of heat is removed, or lessens in quantity as the applied heat is reduced in degree.

THE scientific papers a little while ago had a good deal to say about the wonderful new chemical, *saccharine*, which was the latest scientific novelty of the time. It was said to have a sweetening power two hundred and fifty times greater than that of ordinary cane sugar, and fears were expressed lest glucose sweetened with this new agent should oust the genuine products of the cane or the beet from the market. For photographic purposes there would be a marvellous difference between the actions of the two. There would appear, however, to be little fear of the contingency occurring, for, according to the *Moniteur Scientifique*, Dr. Von Lippman admits that the flavour of the new sweetener is sometimes unpleasant, a sure safeguard against its fraudulent employment.

WE have often referred to the use of the hygrometer in the photographer's workrooms, and we cannot but think that when it is in daily use, and its indications taken note of, many valuable hints might be given by its aid. The ordinary wet and dry bulb instrument, however, finds little favour in the studio or laboratory, probably because it needs a little occasional cleaning. We may, therefore, call attention to a description that has been published of a new instrument for indicating hygrometric conditions and registering these indications. The acting agent in the new machine—for such, indeed, it must be called—is a film of gelatine spread thinly upon a piece of cardboard, coated at the back with asphalt to preserve it from the action of the atmosphere. The inventor has four paper spirals so coated, and attached to them various arrangements for showing the motion of the spiral as it curled or uncurled as the gelatine absorbed or parted with moisture. The apparatus registers automatically these motions, and so enables any one to tell the state of the atmosphere at any particular moment, or at any previous date. It is further stated that a model has been constructed at such a low price as to place it within the reach of all.

As the use of electricity continues to spread in photographic operations, it may be as well to draw the attention of readers to an event that happened outside a shop in Holborn a little while ago, and which if it had taken place in a photographer's studio might have led to a catastrophe. It was simply owing to the electric wire being covered with inflammable materials; the latter had caught fire, and flames a foot long were produced and continued to be for several minutes.

IN our remarks upon studio fog last week, we did not dwell upon the very remarkable exemption from its ill effects enjoyed by those who use the electric light for portraiture, a fact exemplifying to the full the correctness of our suggestions. These were, it may be remembered, to isolate the fog-laden space between lens and sitter from all action of light, and so reduce the action of the fog to the effect of a mere reducing screen instead of a light reflector. Now, in illuminating a sitter by the rays from the electric lamp or reflector they are only directed across a portion of atmosphere of very narrow section, the rest of the space between sitter and lens not necessarily receiving the slightest amount of light beyond the small portion reflected from the sitter and his immediate surroundings. This power of being able to take a presentable negative during a deep fog is one very important point in favour of the introduction of electricity in the studio.

MR. EDWARD M. NELSON in the *English Mechanic*, a little while ago, gave a description of an ingenious plan for ascertaining the components of a cemented object glass without taking it to pieces. Although the method was, in the main, intended to apply to lenses for microscopic purposes, the article gives many hints that might be of interest to photographers. We can scarcely give the account in full in our pages, but we may say, in brief, that it consists in observing the various reflections to be seen in every lens (compound or single) when minutely and carefully examined. Starting from a single biconvex lens, examined near a window, he points out that a large erect and a small inverted image of the window will be seen, the former being the reflection from the front and the latter from the back of the lens. With a plano-convex—convex side to the window—we have a small erect image from the convex side and a large inverted one from the plane side. With the plane side to the window the plane side reflects a large erect image, and the convex a small inverted one, and so on. So much for introductory explanation, which is then followed by pointing out that the cemented surface, even, throws a very faint image, generally bluish, though sometimes reddish in tinge, easily recognised when once seen. It is evident that such a faint image ought also to be visible in a cemented photographic combination, and its presence or replacement by a more vigorous reflection, will tell, without unscrewing the lens, whether it is a cemented compound or not, and approximately the character of its curves. The greatest lesson such an examination conveys is a knowledge of the large amount of reflected light that is thrown off by the surfaces of a combination. Similar reflections may be seen from the inside of a camera completely darkened, when objects of

even slight brightness face the anterior surface of the lens. When these reflections reach a certain intensity they inevitably produce fog—hence the desirability, and, indeed, the necessity, where the highest results are required, of a screen outside the lens to prevent the entry and reflection of external objects in the form of a slightly illuminated and, necessarily, fog-producing area. These reflections, limited to a given area, aid in producing the well known flare spot, and by altering the relative position of the diaphragm they are spread over the plate or concentrated on a particular spot.

Is it possible that some peculiarities of image transference in sensitised and exposed plates may be explained by a discovery published in *Comptes Rendus* to the following effect? M. P. Marguerite Delacharlouny states that liquid particles holding salts in solution are carried away with the vapour, not merely at a boiling heat but at the ordinary temperature. The same process takes place from acid salts in the solid state, such as ferrous sulphate.

THE cleaning of the windows of a studio is looked upon by many as a formidable undertaking, and, for this reason, it is often neglected for very long periods. It is not, however, a very troublesome operation if we enlist into our service an indiarubber squeegee and proceed on the following lines. If the glass be washed with clean water and a sponge, and a soft squeegee be then stroked somewhat heavily over its surface, it will at once be rendered clean and dry. Also, when it is raining, if the outside of the glass be rubbed over with a squeegee the whole of the dirt will be quickly removed without further trouble. For cleansing the outside of the glass the squeegee should, for convenience, be mounted on a long rod, like those used for cleaning the pavements.

THE SULPHURATION OF PLATINUM AND SILVER PRINTS.

I SHOULD have had no wish to enter into the controversy which has been raging for so long on the subject of the comparative permanency of prints by different processes, had it not been that Mr. Andrew Pringle's account of his experiments with bromide and platinum prints so surprised me, that I was constrained to inquire where the apparent discrepancy was to be found. Now, with the Editors' permission, and encouraged by Mr. Pringle's expressed hope that others would follow him and point out if he had been misled, I trust, without diving deeply into the question of permanence, to show how his experiments, carefully conducted though they were, have led him to a false conclusion, and how they bear somewhat unfairly upon the platinum print.

With regard to permanence, I may say that I look upon it as a purely comparative term, and agree with Mr. Pringle that to secure *absolute* permanency the image and support must be permanent alike. That being so, in any consideration of the comparative permanency of prints upon paper, by whatever process produced, the support may be left out of the calculation, being common to all; the image alone requires our attention, first, as regards its own inherent power of resisting destructive agencies, and, secondly, as the mode of its production tends more or less to bring about the destruction or discolouration of the support. In other words, a process which produces an image less easily changed or destroyed than another is more permanent, whilst the method of production which tends most in the direction of permanent discolouration of the support, immediate or gradual, by actual staining or by the formation of alterable compounds that are not removable, is distinctly less "permanent" in the strictest sense of the term. I separate the image and the support, because I think it is here that Mr. Pringle is misled.

On reading the account of his experiments, I could not help being surprised that in every case the platinum picture suffered more from contact with the solution of sulphuretted hydrogen than its fellow silver print. But upon reperusing the article, I find no mention whatever made of *fading*, but simply of "yellowing." The platinum print, says Mr. Pringle, was completely yellow, "the image side, not the back." This might, at first sight, be taken to imply that the

platinum image had faded and become yellow, and such I took it to mean; but when I remembered that the two sulphides of platinum are intensely black substances, it became evident that the yellowness could only apply to the *whites* of the picture, and therefore be due to something contained in the *paper*. If such should prove to be the case from an inspection of the specimens sent by Mr. Pringle to the Editors,* then, I maintain, that so far as the image is concerned there is no evidence of want of permanence in the platinum picture, nor because the bromide prints are less discoloured in the *whites* can it be asserted that the *image* will, for any lengthened period, resist the action of H₂S.

It becomes, then, a question entirely depending upon whether there is anything inherent in the platinotype process which renders the paper more liable to discolouration than in other processes. As I have never worked platinotype myself I am not in a position to say, but others may be; though if it should be so, the experiments only prove that platinotype prints will *discolour*, while they do not disprove that bromide prints will eventually *fade* under the action of H₂S.

Since the above was written for last week's issue I have thought more on the subject, and I fancy I can make it clear that the evidence of Mr. Pringle's experiments are distinctly in favour of the permanency of platinotype.

I am assuming, as I have already done, that the change in appearance of the platinum prints is confined to the paper, and I will further take for granted that the image itself remains wholly intact, since from an experiment with bright platinum foil sulphuretted hydrogen seems to exercise no action on the metal. The changeable substance then exists in the paper quite independently of the image, and we have to inquire what it consists of. Presuming the paper to be pure to start with, it must obviously be something used in the sensitising or development, and that something is clearly iron, for with the exception of the platinum salt nothing else is now used, I believe, but ferric oxalate and potassium oxalate. The question then presents itself, Is it an absolute necessity of the process that a trace of iron should remain after every precaution for its removal has been taken? I have been assured by an experienced platinotype printer that such is not the case, but that it is quite easy with what may be called ordinary care to so thoroughly remove all traces of iron by means of the clearing solution of hydrochloric acid, that the paper will perfectly withstand the sulphuretted hydrogen test.

But supposing through carelessness in clearing the print it should retain traces of iron sufficient to cause yellowness, under the circumstances of Mr. Pringle's experiments, what is easier to remove than the discolouration? Whatever may be the composition of the colouring matter, whether it be sulphide of iron, or whether the latter, by exposure to damp and the atmosphere, be oxidised and converted into basic ferric sulphate, the result will be identical if the print be immersed in dilute hydrochloric acid or chlorine water; the stain will be discharged and copious washing will secure the removal of the soluble iron salt. The operation is, in fact, precisely on all fours with the usual practice adopted when an iron-developed bromide print is treated with dilute HCl to remove any stain, but with this additional advantage, that the platinum print will stand, without its image bleaching, an application, unlimited as regards duration or strength, and which would hopelessly ruin a silver print.

Thus sulphuretted hydrogen may be employed as a test of the removal of the iron from a platinotype without endangering the print.

Of course, if salts of other metals be employed in sensitising, as in the early process when silver and lead were combined with the platinum, there would be a possibility of traces of these remaining in the print as well as iron, and these if sulphurised—especially the silver—would be less amenable to subsequent removal, if, indeed, any means short of destruction of the paper would suffice. But I think it is clearly understood that the modern platinotype is composed of platinum pure and simple.

The principle involved in the sulphuration of a developed bromide print is essentially different from the platinotype. There is certainly

* This is precisely so; the whites are strongly discoloured, but the image itself remains intact.—Eds.

the same danger from the traces of iron left in the paper and gelatine film by the developer, but the image itself is also liable to conversion into sulphide as well as any soluble silver salts allowed to remain in consequence of imperfect washing after fixing. The yellowing arising from iron is removable, that from silver, not; indeed, the very means adopted to remove the iron stain would in time destroy the unsulphurised silver image, leaving the sulphurised portion as well as any general discolouration the most permanent parts of the picture.

Bearing this difference in view then, it is clear, as I wish to point out, that so far as the support is concerned, platinum and silver prints upon paper are both liable to discolouration under the action of sulphuretted hydrogen if the manipulations have not been carefully carried out, but that the silver print offers double risk. As concerns the image, platinum remains unchanged, while silver is liable to destruction under the same influence.

It has just struck me that even supposing (which is unlikely) that the platinum image be converted into platinous or platinic sulphide, both of which are black, and would therefore not cause any material alteration in colour, still; the permanency of the image would remain practically the same, since the sulphides behave in almost a manner to reagents as the metal itself. The former is scarcely affected by boiling mineral acids, while the latter yields only to caustic and carbonated alkalies and alkaline sulphides, none of which influences are likely to be brought to bear upon a picture under ordinary circumstances.

In accounting for the greater rapidity of discolouration of the platinum prints in Mr. Pringle's experiments, I would call attention to two circumstances, namely, the nature of the substance sulphurised and the character of the surface of the picture in the separate cases. The compound of iron in an extremely fine state of division would, I should judge, though I will not say so definitely, discolour under *any* circumstances more rapidly than metallic silver under similar conditions of fineness. But when it is borne in mind that the platinum image, as well as its impurities, are held merely on the surface or in the interstices of the paper support, while the particles of silver are surrounded by a skin of hardened gelatine, it will be seen that the chances of rapid change are vastly in favour of the former, and that the effect in that case would reach its maximum in a comparatively short time.

In conclusion, I think Mr. Pringle's experiments are of extreme value in calling attention to a possible, though not dangerous, cause of discolouration in connection with platinum prints; but I scarcely think it fair to take his results as evidence of want of permanence. On the other hand, he has shown that developed prints on gelatine, when made with ordinary care, will successfully withstand such treatment as they are scarcely likely to experience in the ordinary way; and that though it would, perhaps, be too much to claim for them *absolute* permanence, we may at least associate them with a degree of durability never dreamt of in connection with albumen prints.

C. BECKETT LLOYD.

LANTERN EXHIBITIONS.

Was the lantern evening of the South London Photographic Society at the Society of Arts room on the 6th instant a success?

It certainly was, in many ways. The lantern was, apparently, everything that could be desired—most brilliant light, thoroughly illuminating every part of an enormous screen, with a perfection of definition seldom attained. The slides were most effectively put upon the screen without the slightest movement or hitch of any kind by one of the new systems of exhibiting with one lantern. The number of slides so passed through was not only very considerable, but they were of a far higher average of excellence than on any previous occasion.

Here, then, was every imaginable condition of success, yet it was to me, at any rate, disappointing, although extremely instructive, and I think has taught me several valuable lessons.

1. The screen was too large. In my opinion, lantern screens generally are painfully and unnecessarily large. I have always believed that one of the first canons of art was that large pictures should be viewed from a distance, and that, consequently, a totally different system of composition applies to ordinary pictures intended to be

grasped by the eye as a whole at one time, compared with those larger pictures applicable to mural decoration. Lantern slides may of course include both classes, which may be roughly divided into "panoramas" and "bits." Each class requires different treatment to render an artistic, that is, a pleasurable, effect. In a "panorama" the eye must perforce wander about the picture, and, therefore, a general sharpness of definition is desirable. In a "bit" it is quite otherwise; there is one best point of view to which the eye should be directed, from which the best general effect is obtained. Photographically, this is attained by making the point of greatest interest the sharpest; the eye then, though it frequently leaves it to ramble over the accessories, comes naturally and instinctively back to the sharper part, from which the whole picture is apparently seen at once, but really only remembered in detail.

2. The light was most brilliant, but it utterly failed to render artistically certain slides which were over dense in the shadows, while the intense brilliancy of the high lights only increased the contrast. On the other hand, the brilliancy of those slides which could have been well shown by any ordinary lantern were in no way improved or impaired by the unusual amount of light. This fully confirmed my frequently expressed opinion that there is a standard of density possible which would give equally good results with any reasonable amount of light.

3. The light was the electric light, and not pleasing for many reasons, probably from a violet tinge which it seemed to have; moreover, it was biting and cruel, and a marked example of the old proverb, "It is possible to have too much of a good thing." I do not hesitate to affirm that it is totally unfit for lantern work, that is, for ordinary lantern entertainments, for the very reason of its wonderful powers and perfection, for of course I do not pretend for a moment that its colour could be raised as a serious objection. What was most remarkable was the extraordinary prominence given to every defect. Every dust speck or spot stood out in the most painful relief, and fully confirmed the well-known axiom, "the nearer the illuminant is to a point the more perfect the definition." As in solar enlarging no stop is necessary, the sun forming its own stop, so with artificial lighting—the smaller the source the greater the sharpness.

4. That all the various processes employed were capable of yielding results that would bear even this awful ordeal, but that they were comparatively few. That collodion emulsion fully upheld the estimation I have always held of it as by far the best photographic process yet developed.

5. That colouring a good slide is *sure* to spoil it, while it can hardly improve any bad photographic slide.

6. That at least one slide was destroyed by the heat.

Generally, that while such a lantern is a splendid instrument for taking the conceit out of any one who thinks he can make a perfect slide, a far more pleasurable evening would have resulted from a screen of ten feet in diameter, with one tenth, or less, light power.

Finally, I am extremely gratified that the experiment has been made, because it is to my mind a convincing proof that a great future for photography lies in small negatives for enlargement, and also for oil lanterns with a moderate-sized disc. I have also formed the following conclusions:—

That the oil light is better than limelight, the limelight than the electric light exactly.

GEORGE SMITH.

ECHOES FROM THE SOCIETIES.

THE future importance of orthochromatic plates for almost every purpose seems to be now beyond doubt. Though originally introduced for the purpose of giving a better rendering of colour subjects, chiefly paintings, they now seem to be no less applicable to ordinary work. At the Camera Club Mr. W. K. Burton demonstrated their utility in landscape work by exhibiting prints in which the one from an orthochromatic plate gave a far better rendering of the sky and distance, in their relation to the foreground, than was the case with the ordinary plate. At a later meeting of the London and Provincial Association a similar suggestion was made in answer to a question from the box; while at the last meeting of the Philadelphia Society the applicability of these plates to photo-micrography was urged.

In this latter department few will deny the value of the ortho-

chromatic principle in connection with many different classes of subjects. I recollect, some years ago, when the resources of the photo-microscopist were very different from what they are at present, I undertook to make a series of photo-micrographs on a large scale from whole insects. The optical difficulties in this class of work are not great, but those who have tried to satisfactorily render the various shades of yellow, orange, and brown that such objects present, with the old collodion processes, wet or dry, will know what were the photographic obstacles in the way. Exposing through yellow glass was tried, but was practically useless, owing to the great length of exposure necessary. Orthochromatic gelatine plates, however, would render the whole matter one of the simplest.

In the rendering of stained tissues and organisms; too, these plates will render valuable service. Soon after the introduction of Tailfer & Clayton's isochromatic plates I was shown a number of attempts at photographing bacteria by a well-known photo-microscopist; but though valuable as showing in a graphic manner the character of the organisms, they were, as photographs, considered failures. The preparations were stained, and the bacillæ themselves showed transparent and nearly colourless on a blue ground, and consequently presented little contrast to the ordinary plate. I suggested the employment of the new isochromatic plate, and since then I believe my friend has done a considerable amount of good work by adopting the principle.

Mr. J. B. B. Wellington's application of the orthochromatic treatment to collodion plates is a still further extension of the principle, though it is in reality only a return to the original idea. But, as Vogel pointed out long since, the orthochromatic effect of eosines upon collodion films is many times greater than upon gelatine, or, in other words, the sensitiveness to yellow is increased very much more in a collodion plate than in one of gelatine, the increase in the former having been placed, speaking from memory, as high as sixty times. This being so, it is easy to see how, by rendering a collodion plate orthochromatic, it may be under certain conditions brought nearer to the sensitiveness of gelatine, and with such treatment I should not be surprised to find a reaction in favour of collodion for many purposes.

One application of the orthochromatic principle to collodion plates may be of interest to amateurs, especially those who make their own lantern slides. Most of these are compelled by circumstances to work in the evening and by artificial light, which is all very well if their negatives do not require reducing, and can be printed from by superposition. But if the camera has to be employed the exposure is hopelessly long—I am speaking now of collodio-bromide—hence many who would prefer to employ that process are debarred from doing so by the inconvenience in exposure. But if, by a suitable addition of eosine or erythrosine, an emulsion or plate twenty or thirty times as sensitive to yellow can be produced, we shall be getting—at any rate for artificial light—"within measurable distance" of the rapidity of gelatine, while still retaining the special qualities of collodion. Here is a field.

While the general consensus of opinion is thus decidedly in favour of orthochromatic photography, it is somewhat startling to find a man of some reputation boldly stating, as Mr. George Smith did before the Photographic Society, that he "believed orthochromatic photography to be a delusion." That such a statement should fall from Mr. Smith surprises one the more because on many points he is usually well informed; and if it be correct, then, surely, as Mr. Bolas suggested, there must exist a conspiracy of lying in scientific photographic circles.

It was a happy suggestion on the part of Mr. Valentine Blanchard to the Camera Club to make more use of plain paper for printing purposes. The tendency of late years has been strongly in favour of matt surfaces for printing, and I, for one, am surprised that so little attention has been given to the simplest of all matt-surface processes. Can it be that it is because it is an old process, one that was superseded by the present albumen method, and that to go back would be to err? Retrogression does not always imply the negation of progress; therefore, if matt surfaces be the order of the day, let us produce them by the readiest and most convenient means that will give the necessary quality of result. For artistic effect nothing can exceed in beauty well-executed prints on plain paper, and the process offers a far wider range of tones than either platinotype or gelatine. I do not want to get into hot water, so I will only add that their permanency has stood the test of many years.

I was glad to see in the report of one of the meetings of the London and Provincial a very decided expression of opinion by two members whose experience none will dispute. The question was as to the best method of photographing a white chrysanthemum against black velvet. Mr. A. L. Henderson and Mr. A. Cowan both agreed that a slow plate with sufficient exposure would give the best result. I am pleased at this, because it has been my own opinion for years; but I was astonished a few weeks ago to hear from a high authority on dry-plate matters that the more rapid a plate is the better the gradation, and the more complete the scale or gamut. I must confess that by my own experience has been the reverse—that where the gamut of a slow plate rises, so to say, by tones and semitones, that of a rapid one leaps up by octaves, the intervals being indistinguishable. How often do we find a plate that will give “25” on the sensitometer that will also make a visible distinction between half-a-dozen numbers?

I should like to have heard Mr. W. Tylar's paper on *Useful Hints*, read before the Birmingham Society. I suppose the first great trial in an amateur's life is when he makes his first photographic trip to a distance from home. I know from my own experience how unavailing seem the most careful preparations, and how helpless one feels when, cut off from the “base of operations,” some important item of the kit has been left behind. I have heard of the gentleman who travelled a hundred and fifty miles to take a particular view, and finding he had left his lens at home, executed his picture with a pin-hole in a piece of card. That raised feelings of scepticism. I have seen a High Church parson gaily dancing about a populous village in his shirt sleeves, his cassock doing duty as a focussing cloth, and I wondered what his bishop would have said. I have been startled by the bad language of a young man who had left his changing box at home, and reflected on the sad consequences of youth and carelessness. But these are only outdoor troubles, and Mr. Tylar's hints, from what I can gather, refer rather to matters connected with the travelling dark room—a department generally sadly neglected by the tourist photographer, whose regrets come too late when he experiences the misery of his circumstances; for nothing to my mind is more miserable than working in an improvised dark room, with badly devised makeshift appliances. *Useful Hints* would, no doubt, show how these latter may be improved.

Speaking of improvised dark rooms reminds me of an incident that occurred once when I was staying at a farmhouse in Cumberland. My dark room was a store room under the tiles or thatch, and without a window, and my developing table the head of a barrel, which I afterwards found was the stoek oatmeal cask of the family. It was in the old days of cyanide fixing, and one day I managed to send in one-half of the barrel head, and with it about three-quarters of a pint of cyanide solution into the family supply of oatmeal. Upon investigating matters, and finding there was only a small quantity of meal in the barrel, my conscience refused to allow me to run any risk, so I insisted on paying for the oatmeal and having it turned out. I learnt afterwards, however, that the canny Cumbrian, being loth to waste anything, and apparently doubting my word as to the strength of the “poison,” had given the meal to his pigs, two of which were just about to be killed. Whether the toxic effects of cyanide upon the porcine race are less marked or not than on “the human” I cannot say, but the pigs survived. I expostulated with the farmer on the risk he had run, suggesting that he would have blamed me if anything had happened. His reply was, “Naay! it wadn't ha' mattered! I'se jest gaain' ta kill 'em, and it 'nd a spart t' bootcher coomin'.”

I am afraid Dr. Tulloch had taken my remarks or strictures upon his paper too much *au sérieux*. The “somewhat inane remarks” with which I commenced were intended to prepare him for a little gentle “chaff,” but apparently the surgical operation proved insufficient. However, as Dr. Tulloch says he “purposely introduced debatable matter with the express purpose of having a lively discussion,” he can scarcely blame me if I fell into the trap. Had I been aware that Dr. Tulloch expected all the arguments in a discussion to be on his side I should have let him alone.

Aprépos of the reference I made to the possible barter of cameras for meerschaum pipes, I wished to typify one class of amateur photographers whom Dr. Tulloch does not consider acquisitions to the ranks. The meerschaum pipe is the aspiration of many a lad fresh from school, especially such as find anything like photography to

overtax the brain. Hence the meerschaum pipe is a prominent figure in various “Exchange Columns.” The late J. W. Gough once advised some one to “sell his camera and buy a bicycle—he will never make a photographer;” but I have just come across an individual who has come to the latter conclusion himself, and that in a remarkably short time. In one of the papers devoted almost exclusively to sales and exchanges I encountered a few days ago, under the head of “Photography” the following, which I quote as nearly as possible verbatim, having mislaid the cutting:—

“For sale, Lancaster's Merveilleux quarter-plate camera, cost 21s. a week ago, lamp, cost 2s. 4d., and ten dry plates. Will take 20s., having given it up. Address, &c.”

The gentleman whose experience, extending over one week and involving the manipulation of *two* dry plates, has induced him to “give it up,” has at least one virtue. He has early recognised that *he* will not make a photographer. MONITOR.

THE TRANSFER OF COLLODIO-CHLORIDE PICTURES UPON GLASS, PORCELAIN, AND IVORY.

[Translated from the German by J. Hubert.*]

HERETO the transference of collodio-chloride pictures upon glass was attended with many difficulties while gelatine formed the support. I asked myself the question, Would it be possible to achieve this without heat? and my first experiment has been successful.

Instead of gelatinised, I take gummed paper, on account of its solubility in cold water, which greatly simplifies the manipulation. Treble gummed paper, which can be obtained commercially, is fixed into the coating frame, and to obtain a thick film the emulsion is spread slowly. I print this collodionised paper in the printing frame to such a depth that the lights assume a bluish tint, and the shadows have a deep, black appearance. The transfer may be effected directly or indirectly, so that the pictures may be reversed or otherwise at will.

For lantern slides and window pictures the first process is used, and as the simpler I will discuss it first. A glass plate is coated with a ten per cent. solution of gelatine, dried, and immersed in cold water at the same time with the deeply printed copy; take both out and press into contact with a squeegee. After a short time it will be practicable to remove the paper, and the picture will remain on the gelatinised glass, porcelain, or ivory support. Now fix, by pouring hyposulphite of soda over it; wash well, and dry.†

If it is intended to correctly represent the picture upon its final support coat this with gelatine also. A transfer paper is used, which is prepared by immersing glossy and glued paper into a solution of ether copal varnish. This paper is dipped with the copied pictures into water, both are taken out, and the picture laid upon a slightly larger glass plate. Now squeegee, remove the gummed paper, fix and wash. Finally lay the picture upon the gelatinised surface, squeegee again, and remove the transfer paper. To reproduce negatives which are quite equal to the original, all that is necessary is to make a positive after the first method and from this a negative after the second method. LIESEGANG.

CAN PHOTOGRAPHY LIE ††

HAVING just received a message immediately to come round to a neighbour's house to photograph the dead body of a little girl, and as there are no more sitters in waiting, I undertake the task myself, though I confess my preference for bodies that have as yet not made acquaintance with the unknown multitude that undoubtedly have found that zenith of glory which we that are left behind vainly seek in this vale of hope forlorn. Having examined the certificate of death, to guard myself from any such disasters as catching the measles or whooping cough, or transferring the same undesirable maladies to my customers, I proceed to the chamber where the shadow of death hath cast its awful gloom, and where every aspect seems to bear an imprint of *memento mori*, while the heart is uplifted in silent prayer. Here, in the hallowed and mysterious presence of the sweet little innocent, it is indeed difficult to follow mercenary pursuits. Sympathetic chords, in tender melodies, compel me to persuade the bereaved parents not to carry their intention to perpetuate the sad scene further. Nothing avails, however. It must be done. I cause the child to be placed near the centre of the room, whilst I positioned my camera in the corner opposite, nearest to the window, so as to form a right angle. Having arranged the blankets in such a manner as would form a little bed, I altered the position of the

* See Report of London and Provincial Photographic Association.

† In my own experiments I have previously toned the pictures on their support and succeeded well.—Translator.

‡ Concluded from page 25.

Venetian blinds so as to throw a decided but soft shade on to the face to form the merest point of high light, and employing a plate possessed of the finest gradations of half tones, exposed for the shadows. I only use a reflector in case I am compelled to place the corpse very near the window; but as time of exposure is no criterion, it is always best to use the middle of the room to obtain the softest picture. With regard to position, I take the greatest care not to show the nostrils. I have in this way always managed to produce pictures which were more sleep than deathlike. Here are some of the results. It adds another to the chapter of lies; but who can blame the perpetrator? ought he not rather to be blamed if he revealed the horrible truth, which with every fond look would tear open the wound of despair, which by the other means has passed into the healing state of resignation?

I arrive home just in time to save my assistant from being torn to pieces by a dog sitter, whose animosity he has roused by injudiciously representing himself to be a cat, which contingency the owner had evidently not foreseen when he left operator and sitter alone in the studio. Master Felix being secured by the camera and by the owner, my services are called into requisition by the present guardian of a little lunatic, whose growing tendencies to that state of existence had made it appear desirable to remove him to more appropriate lodgings.

To photograph such an object was rather novel to me, though the guardian was sure that I could represent the poor thing as a perfectly rational being. Now I was just becoming conscious that photographers did occasionally resort to a lie, but here it was forcibly brought home to me that they have a reputation for that malpractice. How dreadful! The lunatic, who probably taking a fancy to me, had embraced one of my legs so tightly that I was divided in my perplexity whether to photograph or to get rid of him. I was, however, not to be in doubt long, for releasing my *pedes*, he seemed to think it fine fun to mount my camera stand and look into the box, as he was pleased to call it.

To describe his antics would be impossible; they were many and varied. Suffice it to say that he nearly drove me to the same fate which so unfortunately had overtaken him before I had succeeded to make an impression upon him and the plate. This state into which I had thus worked myself could not have been more unfortunate, for I had to photograph a lady next who was subject to fits, the uncertain recurrence of which at any moment might be looked for with tolerable certainty, especially under such an ordeal as photograph taking. My unfitting state at such a moment did not seem a fitting occasion to fit the camera into position without causing the fit to be communicated to the subject of fits, but I managed it. You may ask, Mr. Chairman and gentlemen, what this sitter can possibly have to do with my subject. Well, I should certainly not have thought it fitting to mention the matter here had she not been subject to St. Vitus dance as well, and as undoubtedly you will agree with me that photography as yet is not capable to reproduce this amusement truthfully, it must be a lie. If you should, however, think this statement far-fetched, and some of you gentlemen are burning to open a discussion thereon, I feel compelled to name this part as not for discussion, and proceed with lying matters more truthfully narrated. This you may think an easy matter, but it is not such for me, so, as you will probably be getting tired of my paper, I will try to get out of the difficulty by drawing the matter to a conclusion, before my whole day's work has been accomplished. This will be a pity, I assure you, because you lose the best part of it; but there being no rose without thorns, and in England not many days without rain, we must try to make the best of matters. At any rate I was obliged to do so, for a group of forty bicyclists had just arrived, while the heavens began pouring forth their resources of condensed moisture in such liberal quantities that the spirits of my intended sitters were so diluted as to be quite unfit for immediate consumption under the coming ordeal. I received, however, material help in keeping them up from a member of the company, whose exclusive right to joke at the expense of all, myself included, seemed unquestioned, nor would it have been at all within the reach of probabilities that if requested to give some one else an opportunity to speak he would have accorded that facility. His flow of language came to an end, but the rain would not follow suit, and as by this time the next important member—whose cardinal virtues did not include patience—had affected several of his comrades, some of which had already expressed a desire to ride off; an altercation ensued, which ended in the departure of their master of ceremonies. He being out of sight it became evident that that man had been the obstacle, for Master Sol burst out from among the clouds, greeting us with one of his most sarcastic smiles, and withdrew again; but whatever other tricks he might have served us Mr. Wind prevented them, and bracing himself up majestically blew away the clouds that had been despatched by the deceitful luminary. I took the opportunity, and prepared for action. Some little time was occupied in persuading the company to sacrifice the master of ceremonies, but eventually the matter was compromised by my conditional promise to introduce him into the picture afterwards. As this was only promise I hoped to evade the perpetration of this lie, but being fully prepared to do it if necessary I left room for the picture in the middle, which place I chose in preference to make the difference not too striking, as the corners not being always so sharply in focus, would hardly agree with a well-defined studio picture.

To arrange a large group quickly, and obtain at the same time good expressions of most, is a matter of difficulty. It requires influence and

power to impart to the company the knowledge that you are fully master of the situation. The only way to grapple with large numbers is to place part on the ground, avoiding, of course, showing the soles of the feet, part sitting behind on low forms, part standing behind these, the next part standing upon forms, and the last part standing upon tables or double row of forms. The loan of these forms from the nearest school has never been refused to me, and in this case I used them in the manner indicated. I gave each man a number, which is the best way to convey to them quickly and effectually where to look and how to hold the head. I finish up with a few words, telling the company how to avoid the usual meaningless expression, entreating them to remain steady, as otherwise my expensive plates would be wasted, besides courting certain failure, and losing time and temper. I had just readjusted the cap of my lens when a peal of thunder and simultaneous shower of rain put an end to my outdoor operations, the shock being so sudden and severe it disconcerted me so that the very recollection of it now brings my paper to a very desirable conclusion. Gentlemen, real thunder is a terrible thing; it cannot be compared to the thunder of displeasure you may shower upon me. The atmospheric disturbance accompanying the phenomena has always had special influence upon the photographer and his materials. Look upon the qualities of the dry plate makers, thunder, weather productions; these lend themselves seldom to the conditions discussed in my paper, in which I have attempted to show what you all know, that photography can lie.

But I cannot agree with a member's remark of two weeks ago that this paper should have been entitled, "Can Photography tell the Truth?" I think it safer to leave that to the proposer to demonstrate. I can picture to myself the indignation of the fair sex, the horror of the swell, the revolt of old maids, and similar disasters, at the mere hint of a doubt of photography being able to tell the truth. I should recoil from the consequences of such an indiscretion, and it must indeed be a bold man to venture upon the task, which, as it stands, is almost too difficult to treat in a serious manner. I trust indeed, gentlemen, that you will therefore excuse my frivolity. I will finish in a more dignified way. As you are all aware, photography can be used at will for any purpose. By different treatment in the process, by the use of lenses of different construction, by including different angles, by negative and positive retouching, by each and all these means we can, in a more or less degree, describe an object truthfully or inaccurately. If Mr. Jack, the plaintiff, exhorts you to represent the house he built by dimensions especially suited for the purposes of making out his particular case before the Lord Chief Justice, you can satisfy the demand, and you can have it equally in your power to be as obliging if Adam, the defendant, has recourse to your services. How to wield the power you possess is the point. If you are not careful the judge may call you a humbug, if he is so disposed, and if you are over careful you may lose your clients. But take what course you will, let me entreat you not to follow the abominable practice of retouching away all likeness of a person you may wish to beautify. Strive to represent everything and everybody to the very best advantage. If you go as far as making a mule out of a donkey, do not conjure up a horse from the original carcass of the intelligent ass. The great majority of your sitters will be satisfied if you soften the wrinkles of old age, take away freckles, conceal the loss of an eye or a leg, and prevent solarisation of a hairless crown. Those that are not you may safely disregard, and count amongst the number of enemies which you are sure to create if you succeed in this life; and that this may be the lot of all that are assembled here is the earnest and sincere wish of your humble servant,

J. HUBERT.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

The following circular has been issued:—"The success attending the Inaugural Meeting of the First British Photographic Convention, held at Derby in August last, has been duly recognised, and fully commented upon by all the leading English and American photographic and scientific journals. It has been decided by the Executive Committee that the Convention next year shall take place at Glasgow on Monday, July 4, and extend over one week. The hearty co-operation of the Glasgow Photographic Societies has been assured. Of the advantages of an annual meeting of this kind it is unnecessary here to speak, affording, as it does, the opportunity of an agreeable and profitable interchange of experiences, and a pleasant reunion of all ranks of professional and amateur photographers.

"The arrangements will take the following form:—Excursions with the camera daily, to places of interest in the neighbourhood, either by coach, rail, or other conveyance, under the direction of specially appointed leaders. The evenings will be principally set apart for the reading of papers, demonstrations, exhibition of apparatus and mounted prints, in addition to selections of transparencies, which will be shown with the oxyhydrogen optical lantern. A detailed programme of time of meeting and all other particulars will be forwarded to each member as soon as final arrangements are complete.

"The subscription will remain at 5s., it having been found sufficient to cover all general expenses incurred at the last meeting.

"Members who wish to contribute papers, or to become exhibitors, should forward their names at once, with the space they wish reserved, in order to facilitate arrangements and prevent disappointment: a form on the fly-leaf hereof will be found for that purpose.

"I shall be glad to add your name to the list of members, and to secure your support for a movement that must commend itself to every one interested in the art-science of Photography.

"J. J. BROWN, *Hon. Sec.*

"21, Albert-road, Walthamstow, December, 1886.

"Communications may be addressed to the Local Secretary, James Davie, 36, Darnley-street, Pollokshields, Glasgow."

We append the list of the Members of Council, which was inadvertently omitted to be given among the announcements of Societies in our ALMANAC:—R. Bolden, *Derby*; F. A. Bridge, *London*; W. K. Burton, *London*; W. Cobb, *Woolwich*; A. Cowan, *London*; J. C. Cox, *Lochie*; J. Crosby, *Rotherham*; W. England, *London*; W. Forgan, *Edinburgh*; A. Haddon, *Greenwich*; W. Jerome Harrison, *Birmingham*; A. J. Henderson, *London*; J. Henderson, *Perth*; R. Keene, *Derby*; W. Lang, *jun., Glasgow*; Rev. Victor Macdonald, *Cheadle*; A. Mackie, *London*; G. Mason, *Glasgow*; S. D. McKellen, *Manchester*; W. H. Prestwich, *London*; A. Pringle, *Langholm*; H. P. Robinson, *Tunbridge Wells*; J. Stuart, *Glasgow*; J. Traill Taylor, *London*; C. H. Trinks, *London*; J. Tunny, *Edinburgh*; R. Turnbull, *Glasgow*; J. M. Turnbull, *Edinburgh*; W. D. Valentine, *Dundee*; J. B. B. Wellington, *London*; G. W. Wilson, *Aberdeen*. There is, in addition, a large local committee.

THE local Committee held their first meeting at the Religious Institution Rooms, Glasgow, on Thursday night, the 13th instant.

On the proposal of Mr. Mason, seconded by Mr. William Lang, jun., Mr. John Stuart was unanimously elected Chairman of the local Committee.

The local Secretary reported that ninety-eight gentlemen had been nominated as members of the local Committee by the Glasgow members of the Executive, in pursuance of the power accorded to them by the meeting of Council held in London on October 14 last, and that, by the number who had intimated acceptance of the appointment, the local Committee consisted of seventy members, forty-two professional and twenty-eight amateur.

The Chairman explained fully the purpose of the Convention, and pledged himself to do all that lay in his power to make the Convention of 1887 a notable success. He called upon the members of Committee to make such preparations and arrangements as would insure the comfort of, and give pleasure to, the visitors and friends who would come from all parts of the United Kingdom to the Convention meeting at Glasgow in July.

The heartiness with which the Chairman's remarks were received showed that the members of Committee were quite prepared to give a cordial welcome to all the friends who might come.

The Chairman proposed the names of members to form four sub-committees to undertake the necessary labours. These sub-committees to be called, *Reception Committee*, *Exhibition Committee*, *Excursion Committee*, and *Entertainment Committee*.

The Chairman's proposals were adopted by the meeting.

The local Secretary was directed to correspond with the Scotch Societies, and invite their co-operation and assistance.

REORGANIZATION OF THE NORTH LONDON AMATEUR PHOTOGRAPHIC ASSOCIATION.

A NUMEROUSLY attended meeting was held on Tuesday, the 18th instant, at Myddelton Hall, Islington, for the purpose of taking into consideration the advisability of reorganizing the above Society and establishing it on a broader basis.

Mr. J. Traill Taylor, having been unanimously voted to the chair, called upon Mr. H. M. Smith, the Hon. Secretary of the Association, to read the letter convening the meeting.

On the motion of Mr. J. Humphries, seconded by Mr. F. W. Cox, it was resolved to reorganize the Association under the title of the North London Photographic Society.

The proposed rules of the new Society were then read, and after an animated discussion, in which a considerable number of gentlemen, including Messrs. Clifton, Cox, Coventon, Few, Hiscock, Mackie, Medland, Oakley, Spencer, G. Smith, H. M. Smith, and the Chairman took part, were, after sundry modifications, agreed to.

The principle features in the reorganized Society are briefly as follows:—

An annual subscription of 10s. Bi-monthly meetings on the first and third Tuesday in each month. The Society to be open to both professional and amateur photographers. The points arising in the everyday practice of photography to be discussed in preference to the more abstruse questions which are so fully dealt with by the older Societies, with a view

to making this Society, as far as possible, a practical school of photography.

The following gentlemen were elected as officers:—*President*: J. Traill Taylor. *Vice-Presidents*: Alexander Mackie, J. Humphries. *Curator*: E. T. Hiscock. *Council*: Edgar Clifton, F. W. Cox, W. T. Coventon, W. Few, L. Medland, J. Oakley, F. G. Reader, Geo. Smith. *Hon. Secretary and Treasurer*: Medley M. Smith, 5, Beatrice-road, Stroud Green, N.

The Hon. Secretary will be glad to receive the names of gentlemen wishing to join the Society. Demonstrations and papers for several meetings have already been promised. The next meeting will take place at Myddelton Hall, Upper-street, Islington, at eight o'clock on Tuesday, February 1. Visitors are invited.

Department for Experienced Photographers.

DEVELOPMENT BY PYROGALLIC ACID.

LAST week we described the method of development by means of ferrous oxalate.

Previous to speaking of the effects of under or over exposure, and the means by which such can be discovered, and in some measure rectified, we shall give an account of development by the agency of pyrogallie acid.

The method now to be described is one of several hundred different systems of development employed, for nearly every worker, while giving general adherence to a formula, appears to make some slight departure from its strict letter in order to suit his own special requirement. But pyrogallie development is all based upon one foundation, namely, pyrogallie acid dissolved in water together with an alkali. As regards the latter some prefer ammonia, others one or other of the fixed alkalies, carbonate of potash, carbonate of soda, or carbonate of ammonia, or sometimes a mixture of two or more of these.

At this stage we do not wish to hamper the mind of the beginner by presenting to him a number of formulae, but shall content ourselves by giving him such simple directions by which to develop a negative as will render it well-nigh impossible for him to fail.

In a bottle or vessel of any kind—a glass tumbler, for example—place a dessert-spoonful of common washing soda, previously crushed, and to this add a quantity of water not quite sufficient to dissolve it all. If it does, add more soda till the water will dissolve no more. In another vessel do precisely the same, but substituting carbonate of potash for the soda salt. Now take a bottle having turnover lip and a nicely fitting cork, and pour into it equal quantities of the two saturated solutions described, and for each ounce of this mixture, whatever the quantity may be, add about four drops of strong liquid ammonia. You have now a stock alkaline solution which is always ready for use, and will last a long time, as it has to be used very sparingly. The vessels in which the solutions were prepared may now be washed out.

Just before developing, and having guessed the quantity of water necessary to cover a plate when lying in the developing dish, and which may be one, two, or three ounces according to the size of the plate, dissolve in this quantity of water pyrogallie acid in the proportion of two grains to each ounce. Having placed the plate in the dish, face up, pour over it the pyrogallie solution, taking care that it is made to flow over and wet the surface thoroughly, thereby avoiding air bubbles, which would show eventually as white spots on the negative.

Having allowed the pyrogallie solution to act on the plate for about half a minute or more, it is then poured off into a graduate or other suitable vessel, such as a porcelain egg-cup, into which two drops of the alkaline solution have been previously dropped from the stock bottle. This alkaline pyro solution is again poured over the surface of the plate, and a sharp look-out kept for the appearing of the image. Do not get flurried or impatient should the image be slow in appearing: it is bound to come. Still, should an unusually long time, say two minutes, elapse without the image coming, it may be necessary to add one or two drops more of the alkaline solution; but it is wise to do this with care, for if too much were added, the negative might develop with an unmanageable degree of rapidity.

After the details are all well out, let the development be continued until they seem to disappear, leaving nothing but the very deepest shadows white. After this remove the negative, wash it slightly under a tap, and transfer to the hyposulphite of soda fixing bath made in accordance with previous directions.

We shall next week speak of over and under exposure, and how to discover and ameliorate these.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 725.—“An Appliance for Use when Changing or Transferring Photographic Dry Plates into Dark Slides.” L. T. MERRY.—Dated January 17, 1887.

No. 742.—“Improvements in the Production of Coloured Photographs.” L. J. H. CELLERIER.—Dated January 17, 1887.

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC SHUTTERS.

No. 2384. CHARLES DAY DURNFORD, Ordnance Store Department, Edinburgh.—February 18, 1886.

THE object of my invention is to produce a shutter for use with photographic cameras, which can be used either as an instantaneous shutter or for longer exposures, as may be desired, or for the production of double exposures, that is to say, exposures producing the effect of the use of stops or diaphragms of different sizes during practically the same exposures, by the which may be obtained the minute definition of the small stop with the brilliancy and softness of the large stop.

This shutter is preferably used between the lenses when a double combination lens is used, but several of its component parts are adapted for use when the shutter is fitted in front of, or behind, the lenses. With this shutter the ordinary stops or diaphragms may be used; these stops and the slide, or drop, of the shutter being preferably placed in as close a juxtaposition as is possible.

This shutter is similar in its action, and somewhat similar in its construction, to an ordinary drop shutter, but the rapidity of the drop is preferably increased as may be desired by the action of a wire or other suitable spring, one end of which is secured to a pivot placed in a light-tight casing at, or near, the side of the lens tube, while the other end passes through a slot in the lens tube to a staple or other appliance in the drop or slide, and through the same, so that, when this spring is in tension, the drop or slide is forced downwards at a quicker speed. This arrangement is similar to that described more fully in the specification filed in pursuance of my application for a Patent, dated the 15th of September, 1885, and numbered 10,896. Another method of fitting this spring consists in mounting the pivot thereof on an arm or other projection fitted on the frame of the shutter or on the lens tube, or elsewhere, while the other end of the spring is connected to, or held by, or on the top edge of, the slide or drop, which is always outside the lens tube, preferably in such a manner that this end of the spring can be disconnected therefrom when not required. When the spring is connected or attached to drop or slide, the tension thereof, and the consequent rapidity of motion, can be regulated by a lever attached to the pivot of the spring, by which the same can be turned, and when required, held in position by a ratchet rack, as is more fully described in my said specification, No. 10,896 of 1885, or the tension thereof may be regulated by attaching a chain to the end of the lever, and hooking the desired link of this chain on a pin, or jamming the chain between two pins on the frame of the shutter, or elsewhere, or the tension may be regulated by any other usual devices.

The slide or drop, and the aperture or apertures therein, may be of any desired shapes and sizes. When a double exposure is desired, a narrow vertical slot may be made towards the lower part of the slide, which slot at its upper end opens into an upper and larger aperture, preferably of the same size as, or a little larger than, the largest stop or diaphragm that is to be used, or two separate apertures may be made, of which the smaller is the lower one. Suitable recesses or notches are made in the sides of the slide or drop in the proper positions to receive one of the two catches that are connected together, or formed in one piece so as to create a double catch, which is actuated in any convenient manner, preferably by the usual tube and collapsible ball acting on a pneumatic piston in a tube. This double catch preferably consists of a wire or rod, which moves freely across the front or back of the drop or slide, preferably just above the lens tube, on which are formed, or to which are attached, the two catches, so situated that they cannot be both engaged in the notches or recesses in the drop or slide at one and the same time. When one catch is engaged in the lower notch or recess, the slide closes the aperture in the position required before exposure, and when this catch is retired, the slide or drop falls until the other catch engages in the second notch, preferably on the other side of the slide or drop. In this position the light is admitted through the narrow slot or smaller aperture, and when this exposure is finished, the second catch can be retired, when the slide or drop falls home, thus allowing a rapid flash of light through the upper or larger opening, and again closing the aperture, or the notches may be so placed that the first catch holds the drop or slide in position to admit light through the narrow slot or lower aperture, and the second catch holds the same to admit light through the upper or larger opening, or a third notch may be added to combine both these arrangements, or otherwise.

When only an instantaneous exposure is required, a stop can be applied to the double catch, so as to permit the release of the first catch, but prevent the advance of the second catch sufficiently far to engage the other notch.

IMPROVEMENTS IN HOLDERS OR CARRIERS FOR FLEXIBLE MATERIAL SENSITIVE TO LIGHT, FOR THE PURPOSE OF TAKING PHOTOGRAPHIC PICTURES.

No. 2390. FELIX JOSEPH VERGARA, Lordship-lane, Dulwich, Surrey.
February 18, 1886.

THIS invention relates to dark slides, or apparatus for holding and carrying surfaces sensitive to light, which are exposed in an ordinary camera for the purpose of obtaining photographic pictures in the usual well-known way.

It has for its object a novel method of constructing and arranging such holders or carriers so that they can be conveniently applied to the purpose of holding sensitive sheets, or films of flexible material, such as paper suitably prepared and made sensitive, instead of sensitised glass plates as ordinarily used.

My improved film holder consists of a frame or slide of cardboard, ebonite, wood, or other sufficiently light and strong material, two opposite edges of which are provided with grooves or guides fitting upon corresponding guides upon the back of the camera with which it is to be used, and the guides are so arranged that the slide can be inverted when desired, so that either side can be adjusted next to the camera.

At the outer end of the slide is a central vertical groove, into which slides a central plate of cardboard, wood, or other suitable material; and the groove is sufficiently wide to allow two thicknesses of the flexible sensitive film which is to be used to pass freely through it as well as the central plate.

Upon each side of the central groove is made another narrow parallel vertical groove, into which are fitted two opaque sliding shutters, which may also be made of cardboard or other materials, as already described.

These side grooves, and the shutters which slide in them, are separated from the central groove by thin sheets or flanges of similar material, having openings through them corresponding with the openings in the slide, which determine the size of the picture upon the sensitive film.

In order to prepare the holder or carrier for use, I withdraw the central slide, and I take a sheet of the sensitive film of such length as to somewhat more than cover both sides of the slide, and I fit it upon the latter by folding it transversely at the centre of its length over the end of the slide, and I then introduce the latter, together with the fold of the film, into the central groove, and I push the slide into its place, the film being stretched and held steadily upon each side of it.

The two shutters being also pushed forward in their grooves upon each side of the central slide until closed, the entire holder can be fitted in its place at the back of the camera, and the part of the film upon one side of the central slide exposed, the corresponding shutter having been first opened.

When the picture has been taken and the shutter closed, the holder can then be inverted so that a second picture can be taken upon the other part of the film upon the opposite side of the central slide.

The slide or holder made and used in the way described is very simply and cheaply made, light, and easily used; and as each holder contains sufficient sensitive film to take two pictures, a considerable number of pictures may be obtained with a moderate number of holders of comparative little weight, and this method of using flexible sensitive film is more convenient, and requires far less trouble and care of adjustment, whilst it gives greater certainty of result than in forms of arrangement in which a large number of pictures are taken upon a single film of great length which has to be adjusted and rearranged after each picture has been obtained.

The improved holder may be made of cardboard, cemented together in sheets of the required thickness to form the several grooves and flanges, proper openings being made through them where necessary, and in this form it is very light and cheap; or it may be made of ebonite or of wood, especially where large-sized pictures are to be taken.

Suitable stops may be arranged upon the shutters to limit their movement, and the openings through which they pass may be made sufficiently impervious to light in the usual understood way; and tongues or handles are provided upon the shutter and slides for their manipulation.

I make the central slide preferably slightly taper in width, so that it may more readily be introduced, together with the folded film, into its groove, and the ends of the latter may be left slightly protruding when the slide is in its place, so that they may be easily withdrawn with the latter.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 25	Great Britain (Technical)	5A, Pall Mall East.
" 25	Bolton Club	The Studio, Chancery-lane, Bolton.
" 26	Burnley and District	
" 26	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 27	Burton-on-Trent	
" 27	Liverpool Amateur	Royal Institution, Colquhoun-street.
" 27	Oldham	The Lyceum, Oldham.
" 27	Hull	
" 27	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.
On Thursday night, January 13, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. Alfred H. Harman presided.

Mr. A. COWAN asked if Mr. Wellington's orthochromatic emulsion would not have worked even better had he left out the iodide.

Mr. J. B. B. WELLINGTON had not tried the experiment.

Mr. A. L. HENDERSON said that Mr. Hyslop had told him that in making plates orthochromatic he could use ammonia with colouring matters yet develop without any fog at all, and omitting the intermediate use of a bromide of potassium bath.

The CHAIRMAN thought that unless orthochromatic plates would keep well they were not of great commercial value.

Mr. WELLINGTON said that recently he had made some plates with erythrosine and silver, which would keep; the emulsion had been in a wet state for ten days, and was still all right.

The CHAIRMAN remarked that Mr. Edwards had stated that it was not necessary to dye the plates at all. Tailler's commercial plates were not dyed, and in appearance resembled ordinary gelatin-bromide plates.

Mr. WELLINGTON stated that fluorescein gave no visible stain.

The CHAIRMAN thought that of the two comparative plates exhibited at the previous meeting the Monckhoven ordinary plate had not been used to the

greatest advantage; he should like to expose one on the same coloured diagram.

Mr. WELLINGTON had tried the diagram with ordinary plates, and the results were practically the same as those exhibited by Mr. Edwards; when he next tried orthochromatic plates they also agreed with Mr. Edwards's results.

The question was asked, "What is the best material for lining black twill envelopes to be used in place of dark slides?"

Mr. HENDERSON replied that an American cloth, black on one side and green on the other, as obtainable commercially in the market and used by ladies for needlework, was the best thing; he then showed how the American paper slides were folded; in reality, he said, they were made of thin cardboard.

The CHAIRMAN said that hitherto such slides had failed because sometimes, in pulling out the shutter, light was admitted.

Mr. HENDERSON responded that with due care such need not be the case. Plates would fog sometimes through certain kinds of wood.

Mr. F. M. EDWARDS said that he had called to see the platinotype prints yellowed under chemical tests by Mr. Pringle; he thought that it was merely a surface stain, and that any yellowness produced by chemical action upon a platinum print he could remove; at all events, if they would yellow the specimens of platinotype printing, which he then distributed, he would make the attempt and bring up the results at a subsequent meeting. Platinotype printing required good negatives; those by the wet collodion process were the best; the negatives turned out nowadays were not worth calling negatives at all. He then exhibited some beautiful specimens of platinotype printing, among which were some intentionally chemically coloured to give them the appearance of extreme old age.

Mr. HENDERSON said that Mr. Tunny, of Edinburgh, had years ago bottled up some platinotype prints in a strong solution of cyanide of potassium, and he (Mr. Henderson) believed that they were still as good as ever.

The CHAIRMAN did not think that the yellowing of the whites proved that prints were not permanent.

Mr. J. TRAILL TAYLOR remarked that he had some of the first—if they were not the very first—platinum prints ever made, and they were now as good as ever; they had experienced climatic vicissitudes in America and elsewhere, and had been under the influence of the air of London, which in itself was a great test.

Mr. W. COBB possessed the first platinum prints which took prizes, and they were still as good as ever.

Mr. TAYLOR had damped some of the first platinotypes, and suspended them over the gaslights in his former inner office, where the gas was nearly always burning, yet the prints did not suffer; some silver prints suspended under the same conditions suffered seriously.

Mr. EDWARDS had once put some over-printed platinum proofs in a sink, poured nitric acid over them, and put a lump of solid cyanide of potassium on the top of the whole; the paper was not benefited by the acid, but the images were uninjured.

Mr. W. H. HARRISON said that according to Willis's two earliest patents, salts of lead or silver were also used in sensitising platinotype papers; such salts would yellow or darken under the influence of sulphides. It had been announced, after Mr. Spiller obtained the yellowing results with platinotype paper, that the use of lead or silver in sensitising the paper would be abandoned.

Mr. EDWARDS thought that the prints tested by Mr. Pringle had not been properly fixed. When the baths of hydrochloric acid had fairly done their work it was impossible for the prints to yellow under tests.

Mr. COBB said that in the early days of platinotype he received samples of sensitised paper on which it was impossible to obtain pure whites. When once the paper had been subjected to a damp atmosphere, was it possible by any means to obtain good prints upon it?

Mr. EDWARDS replied that so far as his experience went it was impossible.

Mr. H. M. HASTINGS, when drying platinum prints between sheets of blotting-paper by the application of a hot iron, had found that they yellowed.

Mr. EDWARDS would develop some platinum prints at a forthcoming meeting of the Association. If such prints were not permanent it ought to be known, and the question settled one way or the other. None but iron and platinum salts were used in the manufacture of the paper.

Mr. HENDERSON asked how Mr. Edwards knew that, if he bought the paper ready sensitised?

Mr. EDWARDS replied that sometimes he sensitised it himself.

Mr. A. HADDON asked whether on such occasions he first bought his sensitising solutions of the Platinotype Company?

Mr. EDWARDS replied that he purchased them as stated.

Mr. HENDERSON did not see, under the conditions, how Mr. Edwards could know the constituents of the solutions.

Mr. COBB believed Mr. Edwards to be the highest authority living on commercial platinotype printing.

Mr. TAYLOR reminded them that Mr. Edwards had recently received a medal for some of his results.

Mr. J. HUBERT stated that he had received from Dr. Liesegang some of his transfer paper, by means of which the collodio-chloride print could be freed from its support, and used for lantern or other purposes. The film is primarily upon gummed paper commercially obtainable. The gummed surface is coated slowly with the collodion emulsion to get a thick film. The picture is printed until the shadows are dark black, and the lights blue. For lantern pictures the glass is coated with a ten per cent. solution of gelatine. The picture is squeezed down upon it under water, and after a time the paper backing comes off, after which the print is fixed with thiosulphate of soda, washed, and dried. The image can also be transferred to gelatine-coated paper if desired. Mr. Hubert then, by request, read in English an article by Dr. Liesegang from a German publication. This will be found on page 39.

Mr. HENDERSON said that twenty-five years ago there was a very useful albumenised transfer paper in the market, made by Ordish, of Paternoster-row.

Mr. COBB remarked that it bore the name of "diaphanous paper."

The CHAIRMAN stated that it was admitted on all sides that collodio-chloride prints were more permanent than ordinary prints upon albumenised paper.

Mr. HENDERSON added that in time the beautiful purple tone would go from

both classes of prints; he had found this even in the case of some which he had fixed down to glass with Canada balsam to protect them from the action of the air.

Mr. HADDON said that sometimes Canada balsam exercised a chemical action upon substances with which it was in contact.

Mr. TAYLOR stated that Canada balsam would act energetically upon certain salts.

The CHAIRMAN remarked that Mr. Bruce, of Dunae, Scotland, had been turning out collodio-chloride prints commercially for a long series of years, and they were far finer than albumen prints; his great difficulty was that the paper had such a strong tendency to curl in the solutions.

Mr. HUBERT had not found Liesegang's paper to curl. It was not collodionised on both sides.

Mr. HARRISON had recently read in *Le Moniteur de la Photographie* of Paris, that the curling difficulty was ameliorated in such processes by using a collodion containing a minimum of pyroxyline and a maximum of sensitising salt.

Mr. HENDERSON said that something was rubbed into the Woodburytype paper which made it nearly alcohol-proof and waterproof.

Mr. TAYLOR stated that this was done with arrowroot, to prevent the collodion from sinking into the paper.

Mr. Z. H. KINGDON had found black spots to come upon ready-sensitised paper when kept between sheets of blotting-paper charged with carbonate of soda.

Mr. HENDERSON said that that plan of keeping was good for ordinary paper and bad for ready-sensitised paper.

The CHAIRMAN remarked that Mr. Kingdon had better cut his ready-sensitised paper down to the sizes required for use, then keep it in a wide-mouthed bottle.

Messrs. W. J. Wilson and L. Medland were elected members of the Association, after which the meeting broke up.

CAMERA CLUB.

ON Thursday, the 13th instant, discussion at this Club on the subject of *Negative Films* was reopened by an address from Surgeon-General J. L. Ranking. Previous to the reading of the paper [this will appear in a future number] the Chairman for the evening, Mr. W. H. Hyslop, called for the exhibition of any objects of interest brought by members, and Mr. W. H. Crawford showed a compact actinometer, consisting of several negatives of varying densities, useful in carbon and other printing.

Mr. A. R. Dresser handed round some specimens of negatives on plates having the back surface of the glass finely ground, which added very little to the cost of the plate, softened the print, somewhat mitigated the evils of halation, and afforded easy means of retouching.

After the lecture Mr. W. Tomlinson exhibited an interesting series of paper negatives taken by himself in America in 1886, also bromide paper prints from the negatives.

Mr. W. A. GREENE referred to grain in paper negatives and lantern slides from them, as proving much more troublesome in most cases than Surgeon-General Ranking had found it. It was understood that grain appeared unless the film was just correctly exposed. In regard to the Woodbury tissue, it seemed that the new and improved make would not give the defects referred to by the lecturer.

After some remarks from Mr. DRESSER, Mr. H. O'FARRELL asked whether any one could say what the effect of the gums in the Woodbury tissue upon the film would be. Would the oxidation of the gums cause the breaking out of red or opaque spots?

Mr. SPIERS showed a convenient book of oiled sheets arranged alphabetically for stripping paper negatives. He had found red stains come upon oiled paper negatives after ironing.

Mr. HARRIS said that the red spot on certain tissues was a silver spot, and could be discharged by cyanide; it was not oxidation, or ammonia would discharge it.

Mr. H. J. GIFFORD referred to the older processes in paper negatives, and gave his experience in the use of stripping films.

Mr. WALKER gave an interesting account of the preparation of paper and stripping films, and stated that paper contained in itself the elements of failure, as no calendering or pressure would entirely remove the marks of the matrix made upon the substance of the paper when it was in the pulp stage. This led to the introduction of stripping films, and even in these the paper support, which was of the purest kind and specially made, had to be coated with a soluble substratum, which was calendered down and the matrix pressed down before being rendered insoluble with chrome alum and made ready for further treatment. Without calendering the stripped film would be as grainy as the worst paper negatives. In regard to the development of the stripping films, there was no difficulty. Mr. Walker then gave a demonstration of the method of treating the films, which was followed with the closest attention. He explained fully the newly introduced use of collodion instead of the india-rubber solution, a change which made the processes more expeditious, cleanly, and certain. The gelatine backing was made with one surface smooth and the other of a ground character. Some perfect negatives on strippers made by Mr. Pringle were handed round.

After Mr. HYSLOP had related his experiences with negative films, the meeting was brought to a conclusion with votes of thanks to the Chairman and to the visitors who had contributed to the interest of the evening.

On Thursday, January 27, a paper will be read by Mr. E. R. Shipton on *The Wheel and the Camera*. Meeting from seven p.m., paper read at eight.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE first ordinary meeting of the above was held on Thursday, January 13, at the Free Public Library,—Mr. J. Alexander Forrest (President) in the chair, with a large attendance of members.

Mr. Edward H. Higgins was elected a member of the Association.

Mr. FORREST proposed, and Mr. B. J. SAYCE seconded, an extra hearty vote of thanks to Mr. P. H. Phillips for the more than ordinary amount of trouble he had taken to pilot the Association during the past year, which was carried by acclamation, after which the new Secretary (Mr. G. A. Carruthers) was formally introduced to the meeting.

Mr. FORREST then read the following address for the new year, and was listened to with much interest:—

In opening the business of the new year I wish to express congratulations, along with Livingstone's motto, "Fear God and work hard," with excellence as your aim.

The last year has been marked with considerable progress. Our annual *soirée* and exhibition of pictures has proved a great success. I am bound to state I am proud of the Association over which I have the honour to preside for its thorough practical aim, its cordiality, and its harmony.

We have long felt that a closer affiliation ought to exist between the various societies throughout the kingdom than at present exists (by the medium of the journals). We have opened up a correspondence with the Edinburgh and Dundee Societies, and nothing will be wanting on our part to make it productive of good. We also look forward to great results arising from the Congress that takes place at Glasgow in the course of this year.

We have for a long time felt that our monthly meetings got congested with variety of business, and in the hurry to dispose of it sufficient justice was not done to the various interests that presented themselves; as a safety valve to this state of things, a trial has been made of a weekly meeting in Liverpool, at the Grand Café Central, at four o'clock each Wednesday, where a cup of tea or coffee is provided, and the time does not exceed half an hour, so as to avoid any encroachment upon business demands, and conducted without any formality, so that all may express themselves freely, give their experience, and put forward questions for advice. I think this will be a success. At present the Association is not committed to this step, but it will give me much pleasure to bring it up at the next meeting of our Council. I would like also to open up this department and its privileges to kindred societies, such as the Astronomical, the Geological, and the Microscopical. I would embrace all the members outside Liverpool of every Society under the sun that presented their membership cards.

Our Association has issued its complete list of awards for 1887; this is entirely artistic; but why should we not give encouragement to the other two branches of our art-science, namely, chemistry and mechanical inventions? We have members highly qualified, why should we not encourage them? For six years I gave lantern exhibitions to the working classes of Liverpool, and I was deeply impressed with the high educational value of such work. This might be widely extended in the dissemination of technical knowledge as well as the boundless domain of art manufactures.

The grand sin of the photographic world is the squandering of plates on subjects perfectly worthless as pictures. My advice to all beginners is to reconnoitre for views, take notes of the best subjects in an artistic point of view, and the best time of the day when best illuminated; return home and watch for a good and suitable day, and then, and only then, proceed to carry out your determination. Depend upon it, hurry is the bane of photography as well as a good many things we meet with in our life work.

The experience of last year has proved that glass sensitive plates have held their own in producing works of the highest excellence. A new effort is being made to produce "isochromatic plates," that render "the relative value of colours with true gradation in the photograph."

The Eastman film has battled with criticism nobly, and the result is that the oiling difficulty is to be replaced by the transference of the film after fixing.

Printing from the negative is also getting light thrown into it. Autotype, to my mind, stands supreme in permanence and detail. The growing demand for carbon enlargements will go on increasing until some easier mode appears possessing all its virtues, as another revolution amongst the many that have hitherto marked the progress of photography.

Mr. P. LANGE proposed, and Mr. LUTON seconded, a resolution that in future all prints sent in for competition shall become the property of the Association, which was agreed to, as it was felt they would be a desirable addition when decorating at future *conversations*, and largely tend to minimise the expense attendant consequent on having pictures sent from a distance.

Dr. G. A. Kenyon, Medical Officer of Health for Chester, showed a specimen negative taken on a stripped film and mounted on glass, which, although taken under very adverse circumstances, was much admired when shown through the lantern.

Mr. Lange exhibited a number of large, highly-glazed portraits coloured by the new mechanical process about to be brought out by Cellier's Syndicate, Limited, which were much admired and pronounced a great improvement on the old hand-colouring methods. It is of course impossible to paint any photograph so that it will have all the delicacy of colour and *chiaro-oscuro* of the image as seen on the focussing glass, the photographic basis will always remain and be visible under the colouring matter (except, of course, in the case of body colours), but the new process goes far to remove this deficiency, notably in the flesh tints. One portrait, that of an officer in full war paint, showed the improvement of the new process, the vermilion of the tunic having all the depth and semi-transparency of a vegetable paint. The metal portions of the uniform—sword, medals, &c.—were also beautifully rendered, not stuck on like patches of gold and silver leaf, as hitherto the case, but graduated in true high lights and shadow as seen in nature. The operation is said to be simple and the price very little in excess of the ordinary silver print.

The *pièce de résistance* of the evening was an exhibition by Mr. Frederick Evans with his new double oxyhydrogen lantern of nearly a hundred slides made by him from negatives taken during a six months' holiday in New Zealand, &c., last summer, and comprising shipping, landscapes, natives, animals, &c. Some exquisite views of the White and Pink Terraces were greatly admired, as were several of the geysers and boiling mud wells, and as a large tract of this part of the country has since been devastated by earthquake, the views had a more than ordinary interest. Mr. Evans very wisely departed from the usual cut-and-dry guide-book form of lecture, but explained each picture in a very terse and frequently amusing manner. The room not allowing of the usual sheet being put up, Mr. Phillips had arranged a very excellent substitute—a piece of drawing paper about six by eight feet square, such as is used by architects, and can be bought up to any length, he had mounted on two light wood rollers; this arrangement can be hung almost anywhere, and, with a small weight of any sort tied to the bottom, it hangs as flat as can be desired, gives a splendid picture, and has the great advantage of its portability. *Verb. sup.*, let other lanternists take a note.

A vote of thanks by the President to Mr. Evans for the treat he had afforded the members brought an agreeable evening to a close.

CHILTERNHAM PHOTOGRAPHIC SOCIETY.

THE January meeting was held on the 13th instant. This was a lantern evening, Mr. E. Wethered, F.G.S., presiding at the lantern.

Slides were exhibited by the following members:—General F. Dawson, on his own bromide plates; Mr. W. C. Beetham, on Pumphrey's lantern plates; Mr. Joyner, on Cowan's chloride plates; Mr. J. Bull, on chloride plates; Mr. B. Jones, various; Mr. Wethered, photo-micrographs, &c., on chloride plates. There were also shown a number of slides sent by Mr. Pumphrey as specimens of his new lantern plates.

The amateurs had succeeded best with the chloride plates, many of their bromide slides failing in vigour and contrast. This difficulty had been overcome by Mr. Pumphrey in using his own plates.

Votes of thanks to Mr. Wethered and Mr. Pumphrey terminated the meeting.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE first meeting of this session was held at the Technical Schools, Bridge-street, on the 13th instant,—Mr. E. Howard Jaques in the chair.

Mr. B. Karleese exhibited photographs by Mr. G. M. Elton, of New York, which were admired for excellence of composition and finish.

Mr. W. D. Welford passed round some snow scenes taken by himself during the present month.

The recently-formed Lantern Section occupied the remainder of the evening in demonstrations of transparency making for the lantern.

Mr. E. C. MIDDLETON took up the wet collodion method, with the various operations, from cleaning the plate to the exhibition in the lantern, showing the transparency before toning and the result afterwards. Magnesium light was used for the exposure.

Mr. WELFORD then followed with the production from dry plates, and, exposing several of Pumphrey's new plates to gaslight, showed the simplicity of the work and the almost impossibility of failure. During the day he had exposed thirty plates, the exposure ranging, according to quality of negative, from thirty seconds to two minutes in the camera. He prefers copying in the camera to contact copying, finds slow development best, and uses Beach's potash developer, same as for negatives, gives good exposure, and uses a small quantity of citric acid in the hypo fixing solution.

Mr. R. P. TAYLOR gave his demonstration with Cowan's chloro-bromide plates, using the ferrous-oxalate and the ferrous-citro-oxalate developers. The copying was done by contact, and resulted very successfully.

Mr. A. PUMPHREY contributed a paper on *Printing Lantern Pictures by Artificial Light from Various Sizes of Negatives*. [This is expected for an early issue.]

SHEFFIELD PHOTOGRAPHIC SOCIETY.

AT the monthly meeting of this Society, held on the 11th instant,—Mr. W. B. Hatfield in the chair,

A discussion took place about the holding of a social evening at an early date, which was eventually determined upon.

Mr. A. S. PLATTS having read a paper on the working of the new Woolbury tissue, proceeded to develop a film which had been exposed at half-past three p.m. in November for five seconds, using $\frac{f}{16}$. The developer was Beach's potash. An Ilford rapid plate was developed simultaneously with the tissue, which latter was found to be at least equal in rapidity with the plate; the subject of each negative was the same.

Dr. MONTON, in proposing a vote of thanks to Mr. Platts, remarked that he believed that there was a great future in store for film photography, which, however, as a modern revival, was but in its infancy.

There will be a lantern slide competition at the February meeting; members to send in six slides made from 1886-7 negatives, to be passed through the Society's lantern with paraffine lamp, and shown upon a six-foot disc; the judging to be by the members present not being competitors.

YORKSHIRE COLLEGE PHOTOGRAPHIC CLUB.

THE second annual exhibition of lantern slides by this Society was held on Friday, the 14th instant, in the Chemical Lecture Theatre at the College.

There was a very large attendance of members and their friends, and the lantern was manipulated by the President (Mr. C. H. Bothamley) and the Secretary (Mr. Harry B. Hall). About one hundred and forty slides were shown, the contributors being Mrs. J. Knight, Miss S. Knight, Rev. R. W. Atkinson, Dr. E. H. Jacob, Messrs. C. H. Bothamley, A. Cooper, H. B. Hall, H. Ingle, P. Lund, A. E. Nichols, and W. Thomas. The subjects included landscapes from various parts of the British Isles and Europe, together with a number of figure and animal studies. All the slides were prepared on gelatine plates (chloride or bromide) from gelatine negatives. The finest exhibit was a series of views in Norway, by the Rev. R. W. Atkinson, which had been reduced in the camera on gelatino-chloride plates from $7\frac{1}{2} \times 5$ negatives.

CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

THE monthly meeting of the above Society was held on Friday, the 14th instant,—the President, S. W. Allen, Esq., in the chair.

The following gentlemen were elected ordinary members: W. J. Austin and George Shepton.

The PRESIDENT regretted that through a pressing engagement Mr. Kellar's lecture must be deferred until a future meeting. In connection with the Jubilee year he had pleasure in proposing that an exhibition be held some time in the autumn, and he trusted that the members would make a point of securing some good pictures, so that a perfect record of the town and neighbourhood at this interesting epoch might be handed down to posterity. He gladly noticed that the public meeting called by the Mayor had decided to encourage science and art in celebrating the Jubilee locally. Art had hitherto not received that recognition in Cardiff that it was entitled to, neither had the amateur photographer. In his opinion the photographic art was most deserving of encouragement, for, as a matter of fact, it was the only portion of scientific art that faithfully recorded the manners and customs of the world.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE usual monthly meeting of the above Society was held on Friday evening, the 14th instant, in the Royal College of Science, Dublin.—Mr. Howard Grubb, F.R.S., Vice-President, in the chair.

Mr. C. H. MELDON exhibited an enlarging apparatus which consisted of a lantern adapted for using the limelight, and fitted with a pair of eight-inch condensers, in front of which was the carrier for holding the negative (a half plate). On the same baseboard as the lantern was a sliding piece with an upright in which the lens was screwed. The apparatus was so constructed that it was capable of reducing as well as enlarging, so that a lantern transparency or an enlargement could be made from the same negative. Mr. Meldon mentioned that, as a matter of practice, he had to keep the limelight as low as possible, as otherwise there was great difficulty in regulating the exposure, as it became a matter of very few seconds. He also mentioned a circumstance for which he sought an explanation, namely, that, in using a stop of a smaller size than about $\frac{1}{7}$ he could not get the picture sharp by any focussing. Mr. Meldon's apparatus was not covered between the negative and the lens, and he said that he did not find it necessary to do so.

Mr. J. L. ROBINSON said that in his experience an oil lamp was superior to the limelight for enlarging.

The CHAIRMAN said that in his opinion the difficulty of the stop was entirely caused by the condenser.

Mr. Meldon then handed round some enlargements done with the apparatus.

Mr. J. V. ROBINSON, on the part of Mr. Richard Robinson, exhibited Taylor's patent metal dark slide and also a collection of fine prints on Eastman paper.

The members then adjourned to another room where the Society's lantern was lighted, and a number of transparencies sent by Mr. Pumphrey, of Birmingham, as specimens of a new gelatine plate which he has brought out, were exhibited.

The following gentlemen were elected members of the Society:—Messrs. Julian George Butler, Louis Meldon, Thomas Mayne, jun., and William Laurence.

Correspondence.

Correspondents should never write on both sides of the paper.

THE PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—The annual meeting of the Photographic Society of Great Britain being now not far distant, it seems to be a not inappropriate time for the members of the Society, and for the photographic world in general, to devote a little thought to the working of the Society which ought to be to some extent a guide and example to other societies, now so numerous over the civilised world. And to a considerable extent the Photographic Society of Great Britain is a guide and an example to other societies; it teaches them all a grand lesson—which they will do well to study—of *what to avoid*. It is a shining illustration of the dangers of oligarchy. Not only is the blood of the Society frozen, but grievous wounds have broken out on its every part. Though it claims the position of being the leading Society, its meetings are stagnation compared with those of many other societies. Much of the time is consumed in enlarged editions of what may be found inside boxes of sensitive plates and rolls of cunningly prepared paper. With a few exceptions all new processes and ideas of late have gravitated towards the "Parent" Society rather than emanated from it. Complaints, loud and well-founded, have poured in from authoritative sources for years, and not a step has been taken to prevent a recurrence of the grievances. We hear that so-and-so is "inquiring into" such and such. Chaos has reigned in the hanging department, avalanches have swept the packing, Stygian darkness has enveloped the juries, and these matters are to be "inquired into," not, I hope, by the present wire-pullers, but by the Society, and by the photographic world at large, which has a right to expect something like rational management from the Society which claims to represent photography in this country.

This Society, alone in the world, expects its jurors to discriminate between the merits of portraits, landscapes, groups, "subjects," "pistol-graphs," dados, sea pieces, animals, and any other things in heaven or earth that can be photographed. This Society tells off certain irresponsible men to deal judgment among the pictures sent in the hope of finding room on the walls or on a dark corner of a screen. The members of this Society have the privilege of paying one guinea per annum, in return for which they get periodically a report which they can see equally well in the columns of the weekly press, and in return for which they lose rather than enhance any privilege they might be expected to have in the hanging of their pictures. Non-members pay for wall space, but members having already paid their guineas need not in any way be considered, they bring no further grist to the mill. Non-members from foreign countries pay no fees, I understand, and a fine swarm of "pistol-graphs" we sometimes see from them, a variation in practice somewhat hard to understand. And who can say whether our best pictures are hung or declined? I understand—I was plainly told—that this year the jurors saw *all* the rejected pictures; but where were the pictures when the jurors saw them? on the floor, or in the hands of some one, or where? And were the walls not already covered? and would it have

been an easy or a possible task to take down some frames and hang others when the jury saw the rejected frames? Over twenty frames of the Autotype Company were hung, while of four frames sent by the Eastman Company two were rejected and two hung. By what name can we call this? I sent three or four enlargements on bromide paper; the very worst was hung—it had been sent by mistake—while the others were rejected. I can quote other cases where good pictures were rejected and inferior ones by the same man hung. The hanging, in fact, seems to have been a perfect burlesque, and in certain cases very unfair. I say it was unfair to hang over twenty large autotype frames while other good work was unhung. Mr. Bankat points out that nine firms had no less than one hundred and fourteen frames on the walls, an average of twelve frames to each firm (nearly thirteen). Surely this is an outrage.

As matters stand at present I do not see how members, especially country members, can be expected to send frames for exhibition. Our frames are at the mercy of some irresponsible trio or quartette of men; they may be qualified for the post or they may not. And surely members have a *right* to a certain amount of space, subject of course to the possibility of the jurors ordering the frames away in case the frames were very bad or obnoxious in some way. Surely there ought to be a limit to the space allotted to single individuals or firms until at least the claims of members have been satisfied. And surely non-members' frames should be only second to members' frames, the non-members' hung after the members' work is all *well* placed on the walls. I am aware that the Gallery is not large enough to hold all the works sent, and I would be the last to clamour for the hanging of bad works, whether by members or not, but I have no hesitation in claiming for members the first right to be hung in good positions. A frame hung half a foot from the floor is a frame insulted, and a small picture ten feet high is a picture disgraced. They would be far better in the cellar. Members' frames to a certain limit should first be hung as well as possible. After that is done, non-members' work, and members' work beyond the limit, may be hung as the responsible hanger may best arrange. If members are not to have this advantage, who so foolish as to be a member?

The awards are to such an extent a matter of taste and opinion that I do not propose to say anything about them. The point that has always puzzled me is that so very large a proportion of foreign exhibits get medals. For my own part I never can see a proportionate superiority. It seems queer.

The maltreatment of frames in repacking has this year amounted to a scandal, and I for one am not contented with an assurance that the matter will be investigated, the carelessness ought to have been prevented; it cannot be cured by investigation. But it may be prevented for the future by the appointment of one responsible person paid for the work and skilled in the work, and until such an arrangement is made, both for the hanging and the packing of frames, no justice will ever be done, no satisfaction ever given. Where several people have the charge of anything, nobody takes any charge of it. The proverb about "cooks" is not of yesterday.—I am, yours, &c.,

ANDREW PRINGLE.

PERMANENCE OF PRINTS.

To the EDITORS.

GENTLEMEN,—To a working trader like myself, anxious for the reputation of bromide and platinum prints alike, Mr. Pringle's account of his experiments is of momentous interest, and no one knowing his position in relation to the matter as an enthusiastic and painstaking amateur will undervalue the results he has recorded or doubt his disinterestedness in publishing them.

"All the contributors, save only he,
Did that they did in quest of further trade, Sir;
He, only, in a general honest thought
And common good to all, made one of them.
His aim was simple; and the elements
Were such stuff to him, that Nature might stand up
And say to all the world—'This is my Man!'"*

Disastrous as some of your correspondents seem to regard the results of Mr. Pringle's experiments, I will not allow myself to be seriously depressed by them, because, whether correctly or not, I think I detect a reason for the discolouration which has escaped Mr. Pringle's usually acute observation.

Analytical chemists are well acquainted with the difficulty of absolutely removing the *final traces* of iron from any salt which for their purposes must be entirely free from that contamination. Carbonate of potash is a familiar instance, which by the difficulties attendant on the processes of its purification is raised from the price of fourpence per pound in the crude state to half-a-crown an ounce in the absolutely pure state.

It is almost unnecessary to remind your readers that iron forms the reducing or developing agent in the bromide and platinum processes, and I would suggest the question whether the discolouration of the whites in Mr. Pringle's experiments may not have arisen from the formation of *minute traces* of sulphide of iron, stimulated, in the case of the platinum pictures, by the well-known power of that metal to absorb hydrogen (from the H₂S) with an avidity comparable only to that of a sponge for water?

I would recall, also, the fact that neither bromide enlargements nor

* *Julius Caesar*, Act v., Scene 4 adapted.

platinotype prints are likely, in the ordinary course of events, to be immersed in a solution of H_2S , and if steel engravings were similarly treated I think it not improbable that the all-pervading iron in the woody fibre constituting the paper would, after thirty-six hours' immersion, show similar discolouration, which would go far to support the opinion that bromide enlargements, platinotype prints, and steel engravings, are "pretty much upon a par," at least in relation to sulphuration, and I think it will be conceded that any bromide or platinotype which, *ceteris paribus*, behaves like a steel engraving, is for all practical purposes permanent.—I am, yours, &c.,
J. MARTIN.

Bromide and Platinum Printing and Enlarging Works,
4, Park-villas, New Southgate, N.

To the EDITORS.

GENTLEMEN,—In your issue of January 14, Mr. Berkeley is again in print with many statements which seem to me quite irrelevant to the discussion upon the permanency of prints upon bromide paper. My reference to the yellowness of some platinum prints was based upon specimens made by platinum workers of acknowledged skill, and was in no way intended to disparage the process. Mr. Berkeley's admission that the platinotype, as well as the carbon process, fails utterly unless the sensitising materials are carefully removed, is cause for hope that the opponents of the bromide process will in time discuss this question with at least an approach to fairness. Meantime may we hope that he will give the waiting world a detailed statement of his tests, by which he has proved so conclusively to himself the utter worthlessness of bromide paper?—I am, yours, &c.,
WILLIAM H. WALKER.

Office of the Eastman Dry Plate and Film Company,
13, Soho-square, London, W.

ON PROCESSES AND PERMANENCY—A REPLY.*

To the EDITORS.

Now, to turn to Mr. Dunmore's letter, he does not seem to see that the point is that, notwithstanding the greater knowledge and care displayed during "comparatively recent years," the albumenised prints—often turned out, it is said, with care—*still fade*, while others, though carelessly done, remain intact; whence the enigma, how to produce unfading silver prints, and, secondly, how to preserve them! It is even said that silver prints are at the present day greater culprits than ever they were. As I said in my last letter, in these considerations lie the *crux*.

What I mean to enforce is this, that if we take one of Mr. Dunmore's "thirty years'" prints and keep it under other conditions—not as "floorecloth"—it may very likely fade. Secondly, that if it does not fade, can Mr. Dunmore (or any one else) turn out any number of the kind of which he can say, placing his hand upon his heart, that they will behave similarly if similarly treated (though the conditions of keeping need not necessarily be similar, if really reasonable)?

It is new to me to see the constitution of an albumenised silver print put forward as a probable reason for lasting qualities. "What is one man's food is another's poison;" so we have the bromide paper makers claiming that *their* image is metallic silver, and that no silver nitrate comes into contact with the paper! So, you see again, it is "*quot homines,*" &c.!

I do not take "marking ink" on linen to be very lasting. Some inks wash out, others yellow, and I do not know that any will outlast, say, a pocket-handkerchief. However, we are not discussing marking inks nor handkerchiefs (though I quite note there is more of "analogy" in the one than in the other). No doubt the inks are several of them "permanent" enough for practical purposes (handkerchiefs being generally renewed from time to time) to enable the vendors to sell them as such. For what evidence have we that an albumenised print is like a pocket-handkerchief *plus* "marking ink?" Again, I say, we do not want so much *surmise* but more *proof*, or at least *evidence*, which I have alluded to as "analogy."

Mr. Dunmore seems to ignore the fact that though presumably "we have some permanent element in a silver print" (an albumenised one), yet prints containing this same element (gold) fade, just as though the "permanent element" were not there. However, this is rather "a bone" for the advocates of albumenised printing and bromide printing, respectively, to pick than for me.

Mr. Dunmore does not even now see that I do not say that a print which will not stand the tests necessarily is not permanent, but that such tests properly carried out by independent individuals and successfully passed would, as in the case of platinotype, convince all but the most sceptical of their permanency. Instead of such tests being carried out—at least, passed—we are asked (I refer not only to Mr. Dunmore) to take as an article of faith the permanency of what I termed "these untried strangers" (or are they "old friends in new clothing?").

It seems some of us prefer now to make statements on the strength of "faith" rather than on the "fact" as far as it is known. This system certainly has much to recommend it when facts do not fit in well! But I do not see why "faith" should serve for silver, while facts were demanded of platinotype. "Sauce for the goose is sauce for the gander" when *early* recognition of permanency is sought for.

* Concluded from page 31.

In writing as I do upon this subject I claim that there is no "*ipse dixit*" on my part as regards platinotype. Prints which will stand eight years' keeping, combined with treatment by every chemical except *aqua regia*, must lick Mr. Dunmore's "marking ink" into fits for "permanency!"

I say that we have guarantee for "platinotype and carbon 'lasting' unchanged," for this reason, that both platinum and carbon in fine division are known to chemists not to alter their constitution by being kept in any reasonable—or, I might add, unreasonable—way whatever. In specifying "carbon," I mean *carbon*, and not any other pigment, though we have the Autotype Company's assurance that in their methods only stable colours are now used, and I do not question their authority for saying so. Besides, "carbon printing" is not necessarily autotype. Further, it is absolutely certain that platinum will outlast any paper ever manufactured or likely to be so. Any fool can understand this, and I add that the platinum image will last longer than the paper support. This is strikingly illustrated on boiling a print with nitric acid; the paper is dissolved and the platinum forming the image falls down to the bottom of the vessel. Analyse it if you like.

Of course this is merely a coincidence, but a valuable one from my point of view. I quite admit—as I have admitted—that a print *may* be entitled to be termed "permanent" which has its image completely decomposed by even weak nitric acid, and by other tests. Put any kind of silver print into nitric acid of any strength (which need not destroy the surface of the paper), and into several other well-known chemicals, and note the effect. Do the same with platinotype, and you will have a very pretty and suggestive experiment.

I particularly stated in my last letter that I agreed with Mr. Dunmore that the "violent treatment" was not very satisfactory, being too stringent as a test of permanency, but that, when passed, it is a very convincing one, and the only test possible when at the "outset" "faith" is not so strong as it appears to be in some of your correspondents.

Mr. Dunmore's "thirty years' prints," which have withstood "all that time" town air, must be the "exceptions which prove the rule!" I have some early *carte* portraits of members of my family, several of them are still good; but a brother of mine, who had similar prints given to him at the same time, has not one which has not faded years ago. Yet my prints have had more town air than his; but I think I have kept mine drier *at all times* than he has at times done. Mr. Dunmore is exacting in the length of time he requires to decide the question of permanency of albumenised prints. Well, there can be no harm in leaving the question open to doubt for another thirty years; this is very different to taking the "*benefit of the doubt*," and being backed up in the course by others. The bromide paper makers, who take this course, should deem themselves lucky—and probably do laugh in their sleeves—because what was "sauce for the goose" is not apparently to be sauce also "for the gander."—I am, yours, &c.,
HERBERT B. BERKELEY.

P.S.—It is becoming increasingly evident, as I presumed it might, that each writer on this subject is setting up a different standard of what each terms "permanency" that may be best adapted to the process each respectively advocates. It might have been supposed that what constitutes "permanency" in a paper photograph was well understood—felt, perhaps, better than defined—and that no practical difference on the subject could arise. One would also have thought that the nature of the evidence, in lieu of proof, required to support the claim of "permanency" would be patent to all.

As regards the unalterability of unvarnished gelatine negatives, it must be remembered that they are viewed by *transmitted* light. I think there must be several readers able to recall to mind a very uncanny appearance on such negatives viewed by *reflected* light after they have been kept some months or years in the air of London.

Let some of our "Clubists" in search of a subject examine their racks and "shelved" plate boxes, and, "when found, make a note of" this fact, that a positive image is as a *section* of the negative one, and that the former is backed up by white paper.
H. B. B.

San Remo, December 21, 1886.

THE AMATEUR QUESTION.

To the EDITORS.

GENTLEMEN,—Having been attacked on two sides, by friend and foe—by the latter for opposing them, and by the former for opposing the results of the latter—I desire, through the medium of your paper, as the only way of approaching them, to explain to the members of the Liverpool Amateur Society what may seem obscure, and especially as a few remarks in one of your late issues might lead some to suppose I have been in that Society under false pretences, as many even now believe.

Three years ago I resigned, or wished to resign, my position in the above Society, not deeming myself privileged, according to the rules, to remain therein, in consequence of the publication of a portion of my work.

It was with great difficulty I could prevail on the Hon. Secretary to bring my resignation before even the Council, he pooh-poohing it as absurd. The result, however, was that my resignation was refused, and I was informed that so long as I restricted myself to landscape work and did not open a studio for portraiture no objection would ever be taken to

my remaining an ordinary member. And no voice was ever raised against this decision. About the end of last year, however, when the present Hon. Secretary resigned, I had occasion, in the interests of the Society, to object to the nomination of one member to this post,* and within a few days, at a Council meeting at which I was not present, a resolution was carried after two and a half hours' discussion, and of which no previous notice had been given to me, which practically excluded me from the Society.

At the next meeting of the Council, which I purposely refrained from attending, this resolution was rescinded, and at the annual meeting following I was again unanimously re-elected Hon. Treasurer. Yet two charges are now brought against me—first, that I have persisted in remaining a member of the Society against its rules and against the wishes of the members thereof, and that by such action I have injured the Society and caused much ill-feeling. To both of these I can give but one answer—an utter denial, having, as I have already stated, purposely refrained from speaking at any meeting but the one aforesaid, in order to avoid the chance of disagreement.

That the Society has been injured and its interests neglected I affirm, and great blame is due to those who have caused such, and I feel sure that the members will acquit me of all blame in the matter.—I am, yours, &c.,
January 15, 1887. J. H. T. ELLERBECK.

MR. MANSFIELD ON MR. PRINGLE.

To the Editors.

GENTLEMEN,—I protest against Mr. Mansfield's assertion or assumption that the "primary object" of my article on Permanence "would appear to be to discredit platinotype, and thereby to annoy its great champion, Mr. H. Berkeley." Mr. Mansfield, not content with this delivrance, goes on to accuse me of being a party to personalities in the discussion. Where does Mr. Mansfield find any evidence for his accusations against me? If I doubt certain assertions, test them and disprove them, am I to be accused of bearing a grudge to the asserting parties? Why should I seek to annoy Mr. Berkeley, whom I look upon as one of our best authorities on photo-chemistry? I might well have been annoyed myself by Mr. Berkeley's last letter, but unfortunately for Mr. Mansfield my article was, as you know, in your hands and in type before Mr. Berkeley's letter appeared, and, as you also know, it has not been altered since. There must be an end to all discussion if we are to be accused of personal feeling whenever we disagree with others. And as to personalities, where does Mr. Mansfield find me indulging in them? He will find a fair sample in Mr. Berkeley's letter already referred to, but, so far from countenancing them, I declined firmly to "follow any man in such a line of argument." I have not one grain of ill-will against platinotype, much less against Mr. Berkeley. I call platinotype a "permanent" process, only I assert that platinotype prints are hurt by sulphuretted hydrogen and moisture, and I have sent proofs of my assertion to your office. I also assert that sulphuretted hydrogen and moisture hurt bromide prints, and I have sent proofs of that to your office. I also assert that albumen prints are more damaged by H₂S than are bromide and platinotype prints, and I have sent proofs of that also to your office. Where, then, appears any unfairness on my part, or any personal feeling? I have distorted nothing, suppressed nothing.

From Mr. Mansfield's remarks about albumenized paper I gather that he has neither read with sufficient care what I wrote nor tried my experiments himself.—I am, yours, &c.,
ANDREW PRINGLE.

Craigleugh, Langholm, January 15, 1887.

DON'T GIVE PRINTS.

To the Editors.

GENTLEMEN,—Mr. H. Y. E. Cotesworth, in a kindly criticism, which you publish this week, on a paper I read at the Camera Club, mistakes the meaning in my mind, whether my words conveyed it or not. I may say at once the intention of my paper was wholly suggestive of individual practice, without any idea of one of those suggestions becoming a rule that should in the slightest degree control an amateur. When I said, "Don't give prints away," I really meant to preach what I practise. If I ask any one to sit to me to whom I could not offer money I give one print off each negative I take; if more are wanted it is an understood thing that a little photographer in my town can have any negatives I take to print from, and would supply copies as I suggested. The poor model—and I not unfrequently take a beggar from the streets—I pay in coin, and the transaction ends. My object is to send grist to the little photographer's mill. It is also to avoid what has become, I think, a great evil—the spread of false notions as to the cost and value of photographic prints.

* The objection I made to the nomination of Mr. Beer to the office of Hon. Secretary was this, that since he and others had founded the Birkenhead Society all their energies were devoted to that Society, to the neglect of the Liverpool Society—for this I do not blame them, having no right to do so; but, knowing this (and this is proved by a comparison of the reports of the two Societies), I thought it more advisable that we should have as Secretary a gentleman who had always and would continue to devote his whole and undivided attention to ours—i.e., the Liverpool Society. Unfortunately, the cap made for Mr. Beer fitted many others, including, though I never intended it, several members of the Council, our own Secretary, and the President, who is also Hon. Secretary of the Birkenhead Society, and our late President, who also held a similar position, and I very soon found the whole of these gentlemen against me.

Mr. Adams photographs, and he gives prints here and prints there. To Mr. Beattie, who sat to him, he has given half a dozen; of course, they cost but little, say his friends, or he would not do so—less really than the drugs of the chemist, for which he charges so much in medicine. Mr. Beattie wants more, and says he knows he can have them if Jane asks for them. Of course he can! It is the James that complete the mischief. "Oh, dear Mr. Adams, Charles does so like the picture he sat for, but he has given all those away, and I am sure you would let him have a few more, for I want a couple; and, oh! those lovely views of Wales you showed me, would you, oh! would you mind—some time you know—giving me a copy of each of those?" This of course knocks poor Adams over, and when Miss Courtenay has asked him for a few of those prints in which Charles Beattie is so nicely taken—"so clever, you know"—he finds he has printing on hand for a fortnight. Of course, if Mr. Adams likes to sow his work broadcast amongst his friends he has, and ought to have, a perfect right to do so. Appreciation of what he does is the pleasurable payment of successful work. I am supposing cases where the requisition for prints is understood to be one of the smallest asked favours on the one part and irksome to comply with on the other.

I have found that non-photographers consider a print a print, and make little distinction between the value—that is, cost to the producer of a half-plate and one 20×16. I have found, too, a decided preference for platinotypes of large size. But, of myself, enough. In my paper I advised the non-bestowal of prints largely, entirely because I see it liable to convey to outsiders the impression that a negative once secured, prints from it can be taken in no time and at no cost. I fear the whole thing is made too cheap and that the interests of the profession are affected by it. At my home I lay hands on a little shop only too glad to earn a few extra shillings by printing, but I can easily see it might be very different in London, where distances are so great and where a risk might be run by over trust in lending negatives. It is really another instance of what is good for Tom being bad for Harry.

I must add, Gentlemen, the remark that, although I may think Mr. Cotesworth rather overrates the difficulties of good treatment of figures, I feel his commendation of my own work a great compliment.—I am, yours, &c.,
Melton Mowbray. WILLIAM ADCOCK.

GLASGOW.

To the Editors.

GENTLEMEN,—Some months ago you are aware there was a meeting of professional photographers held in Glasgow to consider matters connected with the trade, and how best they could keep themselves informed on all professional matters. It was considered this could be managed in connection with the existing Society, and meetings of those in the trade (earning their bread by it) were to be held an hour previous to the ordinary meeting. Notices have regularly been put on the circular, but there has been nothing done; so, for the present, Glasgow has somewhat dropped the question. It is well to state so in your JOURNAL, because you were kind enough, in a leader, to speak favourably of the matter, and gave some valuable suggestions which would be of great use if carried out through some society or by some newly-formed one.

You see, Gentlemen, we, as professional brethren, don't meet very often, and although there is a deal of good work done yet it stands so much between cheap workers that little sympathy exists. And when one and another leaves their clerkships, and after a little amateurism open glass-houses and push in all directions, and arrange for prices and customers in all manner of ways alongside or on every side of the older men, who cannot go into the new tricks of trade, you see it is not easy to meet in business converse, because we are agreeable men and don't want to differ. So we must just sink or swim the best way possible. The principle will likely hold good—the survival of the fittest, or "the good are taken away from the evil to come."—I am, yours, &c.,
Glasgow, January 15, 1887. ARCHIBALD ROBERTSON.

THEALE PHOTOGRAPHIC EXHIBITION.

To the Editors.

GENTLEMEN,—Kindly note that the Theale Photographic Exhibition can be easily reached by through trains from Paddington, starting at 1 p.m., 3.30 p.m., 5.10 p.m., and 6.30. The best train is the one at 5.10; it reaches Theale at 6.20 (no change of carriage), and a train returns at 8.37. I think, when you see the list of exhibits, you will say that the collection has the pick from the Pall Mall show, and none of the rubbish, with other good work added.—I am, yours, &c.,

ALFRED A. HARRISON, Hon. Secretary.

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

To the Editors.

GENTLEMEN,—Kindly allow me to remind your readers that application for space at our forthcoming exhibition of photographs should be made to the Secretary, Exhibition, Newcastle-on-Tyne, on or before January 31, and, to save time, 5s., the entrance fee, may be enclosed. We hope that exhibitors will be numerous and representative, thus

enabling us to have a display of an interesting and attractive character.—I am, yours, &c.,

J. PIKE, Hon. Secretary, Newcastle Photographic Association, 16, New Bridge-street, Newcastle, January 18, 1887.

A DISCLAIMER.

To the Editors.

GENTLEMEN,—What have I done that I should have been honoured (as I have been in your last number) by having my name appended to what is obviously an editorial article?

I certainly did send an article for insertion, its subject being the *Sulphuration of Platinum Prints*, and which I telegraphed to you at the last moment to hold over for a week, as I wished to supplement my remarks. Kindly put the matter straight, and inform your readers that the article to which I have referred as bearing my signature was not written by—Yours, &c., C. BECKETT LLOYD.

[Our explanation can be given in a few words. When Mr. Lloyd's telegram was received the JOURNAL was made up for press: his article was removed in accordance with his request, and an editorial sub-leader which was standing in type ordered to be inserted in place of it. In doing so the printers allowed the signature to remain *in statu quo*; hence the anomaly. Mr. Lloyd's article in its completed form appears this week.—EDS.]

Exchange Column.

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

Will exchange cabinet accessory, nine changes, for posing chair.—Address, G. & I. Hall, 26, Westgate, Waketield.

10x10 leather bellows camera, brass bound, swing back, single back, exchange for whole-plate tourist with one or more double backs.—Address, W. J. ROBERTS, Photographer, Mold.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

A. BELL.—All the more useful formulae will be found in the ALMANAC. ENGINEER.—The lens being understood to be symmetrical, it matters not which end is placed next the negative.

A. J. W.—Send on a print or two, that we may see the effect of the treatment; but, in the meantime, it may be well for you to repeat the experiments before publishing the results.

S. W. C.—Dammar dissolved in benzol forms one of the best varnishes for negatives that can be applied to the plate without heating. It is not, however, so durable as alcoholic varnishes with a shellac basis.

S. J.—We do not attach much importance to the statement, though it may, nevertheless, be correct. Probably nothing further will be heard of the matter. A respectable solicitor will give you better advice than we can.

H. NEWMAN.—The picture appears to be fairly well illuminated, and we can see no reason for altering your present method of working. For half-plate negatives a condenser of about nine inches in diameter is necessary.

S. WALLER (Hants).—If you want your prints to be unaffected by light, avoid the use of pink-tinted paper like that enclosed. Such paper changes very rapidly when exposed to the light. It is impossible to say if the mounts contain anything deleterious without making a chemical examination.

J. N. (Herts).—One hundred grains of silver nitrate to the ounce of water is far stronger than is ever used for sensitising paper now-a-days. At one time this proportion was sometimes used, though not as a rule. Sixty grains is now looked upon as a strong bath, and this strength we advise you to adopt for your particular work.

CHLORIDE.—I. The tones appear to be very good, though they may not be those you desire. Almost any tint can be obtained, according to the time the prints are allowed to remain in the bath. Why not try the old fixing and toning bath by way of experiment? that may perhaps answer your purpose.—2. If you, by working in the studio, cannot decide which is the best end to place the sifter, we scarcely care to hazard an opinion.

MACRETH complains that many of his negatives taken last summer are showing a curious appearance on the varnish, something like "fish scales," and sends a sample. The cause is very clear: the hyposulphite of soda has not been thoroughly removed, and has therefore crystallised out on the surface. If the varnish be dissolved off the negatives can be rewashed to remove the salt. If this plan be adopted it will be well to treat the plates with alum as a safeguard against frilling, which sometimes takes place under this treatment.

W. B. CASSINGHAM writes: "Gelatine has been recommended for mounting prints; will you kindly inform me, in 'Answers to Correspondents,' how to prepare the gelatine as a mountant?"—For ordinary purposes the gelatine is simply dissolved in water and used warm; but if the prints have to be mounted with a margin and cocking avoided, part of the water should be replaced by alcohol. The amount of alcohol that may be used is dependent upon the gelatine. Some samples will bear a much larger proportion of alcohol without precipitation than others.

J. E. GUBBINS writes: "Can you or any of your readers tell me whether Durrford's 'Right-about-turn' shutter is a durable one and not likely to get out of order? Its lightness, small size, and neatness, recommend it, but I have heard that it has a trick of striking work."—In reply: There is no reason why, if well made, the shutter should stick; the principle is good. One or more that were shown in the last Exhibition certainly did stick, but this may have arisen from their having been handled carelessly by the visitors. We cannot, however, speak of them from personal experience.

GEO. SMITH says: "I have lately taken a few snow scenes, and the negatives, owing to the long time taken in development, are of a deep yellow colour. I cannot remove this stain by the ordinary 'clearer' (acid and alum), as it has had no effect even after a three hours' soaking. Can you recommend something which would act as a decolouriser? If so I should feel greatly obliged. The negatives were developed with soda and pyro, and if the stain was removed they would give good prints."—The yellow stain frequently caused by long development with the soda developer is often very difficult to remove—sometimes impossible. Perhaps some reader can assist our correspondent.

G. W. ATKINS writes: "I should be glad if you would inform me the reason why bichloride of mercury blackens a wet plate but bleaches a gelatine one, requiring ammonia or other application to give a black effect. The textbooks say that bichloride behaves the same in both cases, that is, it bleaches by forming a double salt of silver and mercury. This has not ever been the case with me in reintensifying a wet plate after the usual pyro-silver intensifier."—Bichloride of mercury acts in a similar manner on a wet plate as it does on a dry. We fear our correspondent is not a close observer, otherwise he would notice that when the bichloride is first applied it slightly darkens the image and then commences to bleach it in exactly the same way as it does a gelatino-bromide plate. When the image is bleached it can be blackened the same as in the case of a dry plate.

F. M. S. writes as follows: "Will you kindly tell me whether the registration of a photograph at Stationers' Hall gives the owner of the copyright power to prevent the registered photograph being sold without his permission? A dealer in photographs here is buying my photographs, some of which are copyright, from some firm whom I supply away at trade price, and is selling them at a trifle over the cost instead of at my usual price, because I refuse to supply him direct. This I cannot do as I agreed only to supply three people here. These three say if I do not stop the man from underselling them they will not buy any more. I cannot tell from which of the wholesale houses I supply that he is obtaining the goods, but if the fact of some of the pictures being copyright will enable me to stop him I shall do so."—Our correspondent certainly cannot stop the sale of the pictures. He having sold them the purchaser can of course dispose of them at any price he chooses. If any of the copyright pictures had been pirated the case would be different, and then the sale could be stopped.

* * Several correspondents in our next.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting of this Society will take place next Tuesday, January 25, at eight p.m., at 5a, Pall Mall East, when the subject of orthochromatic plates will be discussed and results shown.

LECTURE ON LENSES.—On Wednesday evening, the 26th instant, a lecture on *Photographic Lenses* will be delivered before the Society of Arts by Mr. J. Traill Taylor. Those, not members, desirous of being present will have facilities afforded for their admission by applying to Mr. Trueman Wood, the Secretary. It is understood that the lecture will, by request, be repeated on an early occasion at the North London Photographic Society.

PHOTOGRAPHIC CLUB.—On Wednesday, January 26, 1887, will be held the exhibition meeting of the Club of work done by the members during the past summer. Photographs must be delivered at the hotel, addressed to the Hon. Secretary, some time before four o'clock of the day of exhibition. It is proposed to make the evening additionally attractive by the introduction of music, singing, recitations, &c. Gentlemen who will give their assistance are requested to communicate with the Hon. Secretary.

DINNER AND PRESENTATION TO MR. GLAISHER.—It is now an open secret that a fine marble bust of the esteemed President of the Photographic Society of Great Britain has been executed by a rising young sculptor by request of several of Mr. Glaisher's friends, and is pronounced by all who have seen it to be an excellent likeness. It is to be presented to Mr. Glaisher at a dinner at the Holborn Restaurant on Monday, the 31st instant, Captain Abney and Mr. W. S. Bird respectively Chairman and Vice-Chairman. Any personal friends of Mr. Glaisher can have tickets (price 5s.) on application to Mr. Bird, 74, New Oxford-street, W.C.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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COAL-TAR COLOURS IN PHOTOGRAPHY.

THE use of the term aniline dyes, or aniline colours, is so frequent, and usually so incorrectly applied, both popularly by the masses and specifically by the photographer, that we purpose giving a brief account of the particular class of colours thus spoken of, as already they subserve so many uses in photographic operations, and one series bids fair to be of the highest importance in the photography of the future.

The whole development of the manufacture of these colours has taken place within the memory of some of the younger of our readers, for it is only just over thirty years since the world was astonished by the production of the first of the series, the once fashionable mauve, which really was an aniline dye, and the popularity of which, and its congener magenta—equally correctly so named—led to the vulgarisation of the technical term aniline, which came into common use, and has since been retained by the public for use with all succeeding colour inventions connected with coal-tar, though they may only be connected in the most remote degree with the chemical in question.

When coal-tar is distilled an immense variety of substances, liquid and solid, come over, and it is the business of the tar distiller to obtain them in the most economical manner, in a separate form, the various processes for carrying on the operations, or for purifying the distillates, being unnecessary to be detailed here. Practically the products of commercial importance in connection with our subject are the hydrocarbons and the phenols, the former consisting, as their name implies, of hydrogen and carbon, and the latter containing these elements and oxygen also. The well-known carbolic acid is a typical, and the most important, phenol.

The hydrocarbons of importance are benzene, toluene, the xylenes, naphthalene, and anthracene; and by the aid of the two first named was that aniline obtained which in the production of mauveine and magenta gave rise to the well-worn aniline dyo title. In attempting, in this briefest of sketches of the most intricate of all modern processes of technical and theoretical chemistry, to treat the subject in a manner at once popular and interesting, while sacrificing as little scientific accuracy as possible, it will be understood that we write not for experts but for our readers generally.

We may say, then, that these colours may be divided into groups according to the substances employed in their production. We first have those from benzene and toluene, as already spoken of, those from the phenols, from naphthalene, and, lastly, from anthracene.

The first division contains all the dyes first invented, and others; thus the magentas, many browns, oranges, greens, blues, violets, and blacks. The second, embracing the phenols,

contains the yellow dye, picric acid, and some other important yellows, besides a very permanent green, and other colours. The eosines may be included in either this division, the preceding, or the succeeding. Pyrogallie acid also belongs to it. The third division contains some reds and yellows, and the important bodies named azo dyes. The fourth division includes alizarines, purpurines, and alizarine compounds.

It is thus seen that photography borrows from all of these groups, there being magenta (including roseine and fuschine), aurine, eosine, and the alizarine colours (used in carbon printing) respectively, with many others, not to speak of the raw material, benzene itself. One of the most important uses to which these colours have been put, leaving aside for the moment the manufacture of ortho or isochromatic plates, is to form colour screens to modify the light in photographic operations, and there can be no doubt that owing to the immense range available, almost any requirement can be satisfied by their aid. It must, however, be admitted that for continuous use as a daylight colour screen they are not to be recommended, owing to their comparative fugacity when exposed to strong light. We do not mean, in so saying, that coal-tar colours are more fugitive than other dyes that might be obtained, for such is not the case. They are made as "fast" as any dyestuffs ever employed by man, but the number of colours fast as against light is not very great, and, further, no colour in the world that would be of photographic use will stand continuous sunlight for example. The result of the use of these colours to screen a window exposed to a strong light would be that in course of time change would occur, and so gradually, that it would not be noticed, fogged plates might then result before the cause was thought of, for the change would not necessarily be visible to the eye.

Again, granted the possession of a series of colours suitable apparently for photographic purposes, the eye again would be no guide as to their value. Of course, the test of experience could any time be applied; but there is a tendency to choose a colour that looks as if it would not let light through, and, scientific though our processes are become, there are not many photographers at present who employ a spectroscope. Such an instrument occasionally used would quickly render perceptible an alteration that permitted any harmful visible ray to pass, though by the eye the change might remain undetected. As to the actual facts of visible fading, we may say that the two colours most known to photographers—aurine and roseine—will lose their colour very rapidly in sunlight, and quickly in ordinary daylight.

It is quite a mistake to suppose that a yellow dye—take, for example, picric acid—appears yellow because it absorbs all

other rays but the yellow, and that they alone pass through. The real explanation is that it absorbs the colours complementary to yellow, but permits reds and greens of various shades to pass, which latter, having the effect of white upon the eye, simply affect the light by making the yellow appear paler by its admixture with white. A knowledge of these facts would be of material aid in selecting screens.

Magenta, again (using the well-known term, for roseine and fuschine are equally magentas—salts of resaniline), when in very strong solution allows only red to pass through; but when diluted, it only absorbs the rays between D and E, thus leaving a photographically active margin to pass through. Captain Abney showed how, by using an aurine and a roseine screen combined, the actinic rays passing through the one were kept back by the other; and thus a perfect light screen might be made, which for occasional experimental work would be invaluable. We should not recommend it as a permanent dark-room window screen where a plentiful supply of daylight had to be kept out.

Again, the absorptive power of a given dye is altered according to the medium in which it is dissolved, and it is quite possible for the same rule to hold good with what might be termed the cementing material when it is laid on glass. Thus shellac varnish, collodion, or either with glycerine, have been recommended as media for conveying a coating of colour to glass; it must not, however, be accepted as a matter of course that the effects obtained with one are the same as those which may be produced with the other.

We have said enough in a general way, perhaps, and will now turn to the colour that attracts the greatest attention amongst photographers at present—eosine, although this name, while used to specify a particular dye, is really properly applied to a group of dyes. This colour, however, is of sufficient importance to merit being treated by itself, and we will, therefore, defer to a further number all discussion of the remarkable series of bodies that in connection with colour sensitive plates is exciting, and for some time to come will continue to excite, so great an amount of attention amongst all photographers, scientific and practical.

GELATINO-CHLORIDE PAPER.

CHAPTER III.

It is perhaps scarcely needful to say that before placing the gelatino-chloride paper in the printing frame, care should be taken to see that there is no damp lurking about either the negative surface or the pressure pads. Yet, in view of the very different nature of the soluble gelatine surface as compared with *insoluble* albumen, it may not be out of place to point out the necessity of a little more care in the matter than is requisite with ordinary silver paper.

With the latter, if sensitised at home, it is well known that unless perfectly dried before printing there is great danger of injuring the negative by silver stains; but so far as we have seen there is little, if any, tendency in this direction with the gelatine paper, owing to the minute quantity of free silver present in it. The danger comes wholly from the chance of the gelatine surface becoming glued to the negative, if there be damp influences to help it, and as, especially at this period of the year, there is always a certain amount of damp in the atmosphere, and the paper itself appears to contain a minute trace of hygroscopic matter—probably glycerine—it is well to reduce the risk to a minimum by attending closely to the

drying of the negatives as well as the printing pads, if they have been laid aside for any length of time.

In actual printing the paper will be found very much more rapid than albumenised when thin negatives are in question, but in the case of very dense images the difference is little, if any. The sensitive surface colours rapidly in the light, but soon reaches its maximum depth of tint and exhibits no appearance of “bronzing” in the shadows from over exposure the effect of which is simply to colour the lights without bringing about undue heaviness in the deepest shadows. Thus gelatino-chloride is eminently adapted for use with thin negatives, and will be found to give satisfactory prints from negatives which are quite useless with ordinary papers. But though suitable for negatives lacking force, it is by no means rendered useless for those which possess great density even to hardness, as might be expected, though here the increased rapidity in printing is not noticed. The explanation of this curious fact appears to be that the shadows of a “hard” negative rapidly reach their maximum of colouration, beyond which further exposure to light is incapable of moving them, and the lights and their half tones are thus allowed time to acquire sufficient force without heaviness in the shadows.

It is a question whether, after exposure, the prints require any washing previous to toning. The quantity of free silver present is so small as to interfere scarcely, if at all, with the action of the toning bath, and we have secured admirable tones by plunging the prints in the dry state directly into the toning bath. At the same time, for the sake of uniformity of action, it is better to pass the prints through at least one water before toning, as this will remove at least some of the slight acidity the paper exhibits; while the believers in thorough washing of albumen prints in order to remove all the silver previous to toning will, for the same reason, follow a similar course with the new paper.

The *débutant* with the gelatino-chloride paper must be prepared when he comes to the toning to entirely set aside his former notions of the process in connection with albumenised paper. Baths of the ordinary strength are no use whatever, as they simply discolour the print without altering its tone—as we understand the term. Nor is it possible to alter or expedite matters by warming the bath, except to such a point as will be insufficient to cause solution of the gelatine surface.

In very cold weather it may be permissible to slightly raise the temperature of the solution, bearing always in mind that the warmer it is the more tender will be the surface of the prints. Another difficulty lies in the erratic manner in which the image behaves in toning. Sometimes the change of colour will proceed as regularly, if not as quickly, as with ordinary paper, and the image will suffer little alteration in fixing. At others, though the apparent tone may be obtained as readily, it will disappear in fixing, and leave a hideous foxy-brown colour suggestive of fixing without toning at all. The best plan is to rely upon the colour the image shows on looking *through* the print; but even this is not an infallible guide, though after a little experience little difficulty will be experienced in securing regular tones of the desired character if the paper is at all capable, under the treatment to which it is submitted, of giving such tones. Warm browns, verging on purple, are easily obtained, and cool neutral greys give a very pleasing effect by carrying the action further. If this latter colour be appreciated, it is the safer and easier to aim for, since over action of the gold bath does not, as in the case of albumen prints, reduce it to the miserable blue tint so

common from over toning. To give enough time is what is required.

As regards the toning bath employed, it must be of greater strength than that usually applied to albumenised prints—even as strong as one grain of gold to two ounces of water. In the formula issued with more than one of the commercial papers a small trace of sodium hyposulphite is used, but we have been unable to detect any advantage in this addition, so prefer to discard it as a questionably useful and probably dangerous complication. The following is the best combination of many we have tried :

Chloride of gold	2 grains.
Sulphocyanide of ammonium.....	20 „
Phosphate of sodium	20 „
Water	4 ounces.

This is specially adapted to the cooler range of tones, but if the warmer class be preferred acetate of sodium may be substituted for the phosphate. The above quantity of solution will suffice for a sheet of paper of the ordinary size in the case of warm tones, and for about three-quarters of a sheet for the colder. Patience must be exercised in the operation.

Fix in a ten per cent. solution of fresh hypo for twenty minutes, and then transfer to a dish containing chloride of sodium (strength not very material) for another five minutes, then wash in the usual manner for three or four hours in running water, and finish off with a bath of chrome alum, ten grains to the ounce of water.

The surfaces of the prints are not particularly liable to damage during washing, though more tender naturally than albumen; but they require the greatest care in drying, especially in avoiding any application of heat. If required to be dried rapidly, after *thorough* “*aluming*” they may be “*dabbed*” surface-dry with a cambrie handkerchief, and afterwards hung in a draught of cool air. They show little tendency to curl.

PROVERBIALY, November has the credit for being the darkest month in the year, but we think that, in the opinion of most photographers, to January should be awarded the palm, as this month usually eclipses the former for the most non-actinic light. This year January has been no exception, for, during an entire fortnight, the aggregate sunshine recorded at Greenwich amounted to three hours only. As a matter of fact, this amount was registered in one week—in the other it was *nil*. A profitable time this would have been for Metropolitan portraitists in the wet collodion days.

A CASE of interest to many is at present under investigation at the Bow-street Police Court. A charge of conspiracy to defraud has been instituted against certain individuals trading under different titles, as “*The Decorative Art Institute*,” “*The Tint Oleo Company*,” &c. By means of advertising, ladies have been induced fraudulently, it is alleged, to part with their money under the idea of eventually being able to earn liberal sums by painting Christmas and similar cards. It would manifestly be unfair to make any comments while the case is *sub judice*; but as the prosecution has been taken up by the Treasury we may rest assured that justice will be done.

It is truly surprising to note how frequently the system of rendering photographs translucent and then colouring them from the back has been resuscitated, and the high-sounding titles under which it has from time to time appeared. This method—originated in the very early days of paper photography—has been even patented over and over again. Large sums have also been realised by teaching this plan of colouring. With this no one would demur, provided the pupils who pay their money were confined to that class who can appreciate this

style of “*art*” and only desire to practise it as a pastime. Unfortunately, however, many needy ladies have often been allured by unscrupulous individuals into paying for tuition, under the idea that after they had learnt “*the art*” they would possess the means of earning a livelihood, in a genteel manner, by colouring photographs for the profession. After expending, perhaps, from two to ten guineas—often out of slender means—for tuition, and being pronounced proficient, the victims find that they have been grossly misled. This system of obtaining money is nothing less than a cruel fraud upon a comparatively helpless class, and is one upon which the Treasury will do well to keep an eye.

AZALINE, or azaleine, which has been much inquired about of late, is one of the coal-tar colours. It is a nitrate of rosaniline, and is sometimes sold under other names—such as rubine, new red, fuschine, &c. It may be obtained from most dealers in aniline colours. This is not the same material as Dr. Vogel calls “*azaline*,” that, we believe, is a mixture of cyanine—the colouring matter of some flowers, such as the violet—and chinoline blue, the latter being the iodide of cyanine.

THE employment of eosine and chlorophyl, also colour screens, in connection with photographing colours, was practised more than ten years ago on, we may assume, a commercial scale. In 1876 M. Ducos du Hauron took out a patent in this country for improvements in photography, in which each of these materials are employed. Photographing through coloured screens, with tinted films, as a means of more correctly translating colour into monochrome, is not the novelty that many appear to imagine.

JUST now considerable attention is being paid to the question of the permanence of photographs made by different processes, and a great deal of ingenuity expended in devising crucial tests, with the idea of settling it, and thereby forestalling time—the real test. It is to be regretted that a similar amount of skill to what has, at times, been expended on finding out how prints may be caused to fade, has not been devoted to discovering the means by which those which have already faded could be restored. If such a process could be devised it would prove an exceedingly valuable one. Thousands of persons who have faded photographs of dear or departed friends, would be glad to pay liberally to have the prints restored to their pristine condition. Theoretically, the thing ought not to be impossible, seeing that, in the case of a faded silver print, all the material which originally formed the image still remains in, or on, the paper. It is all there, though its condition is altered. While every consideration should be given by experimentalists to making the photograph of the future as permanent as possible, it will give some attention to the restoration of those of the past. Here is an interesting problem to solve, and no doubt it will be some day, when great credit will redound to the solver.

PRACTICAL EXPERIENCE WITH THE ETHOXO LIGHT.

FOR a very long time, like many others, I looked upon this light with a great deal of suspicion, which I think was needless, for when the matter is investigated in a scientific way the whole affair seems simple, and I may say safe with *properly* constructed burners and apparatus, and with care I think little to be feared. The accident in Yorkshire I think deterred many from using it. I read the evidence very carefully, and to me it appeared gross carelessness. I often wonder there are not more accidents with the linelight than there are, seeing the reckless way some go to work. One of the chief causes I think may be attributed to things being done in a hurry (as regards preparation) at the last moment.

The first practical insight I had of the working of the ethoxo light was at the last exhibition of the Royal Cornwall Polytechnic Exhibition, at Falmouth, in September last, through Mr. Beard, Messrs. Oakley's representative. Being there officially during the whole week I had ample time to investigate it thoroughly. I then resolved to use the light myself, and had an ether tank made of the Hardwich-Oakley form, a full description of which was given in the pages of this JOURNAL some twelve months since, which was very explicit, but

at the same time there is nothing like seeing the thing at work in such competent hands as Mr. Beard's. I have eagerly read all I possibly could on the matter. Those saturators where a roll of flannel is saturated with ether I do not think sufficient to last for an evening's exhibition, and if there is any danger I think it would lie in running short of ether.

With the Hardwich-Oakley saturator, or tank, the size I have holds sufficient to last at least two and a half hours. In this saturator a part of the oxygen is passed over the surface of the ether, and there is no doubt about it becoming perfectly saturated.

There is another saturator I have seen described, being a kind of a wash-bottle arrangement, similar to that used for washing oxygen after it leaves the retort; with such an arrangement the light must be very unsteady on account of the bubbling. I have refrained from making any remarks upon this light until I had had it in use some time. The ether I use is methylated ether, s.g. 720. I fill the tank with it, or as much as it will hold without blowing out of the outlet tap when blowing through with the breath from the inlet tap. I place the tank close against the back of the lantern, using two short lengths of stout red rubber tubing for the connections with the side tubes of the lantern; when out of condition it does not cost much to renew them. When all is ready I open the inlet tap and the outlet which leads to the hydrogen side of the burner, and light up, to warm up the limes and condensers for a short time. There is one thing, the ether vapour must not be allowed to issue from the jet and escape, but must be lighted as soon as turned on, or the audience smell it at once and get alarmed (that is, some of the nervous ones). As soon as the limes are warmed the direct supply of the oxygen may be turned on in the usual way, and the result is a pure and brilliant light, according to the pressure from the bag or the bottle, very little inferior to the light given by the mixed jet—in fact, it is a mixed jet to all intents. I find that when using this light, if the slides are of a rich, warm tone in themselves, they will show the same colour on the screen. It is not always so with the ordinary mixed gases, for I have noticed, frequently, the coal gas supplied from one gas works will give a light of a reddish or yellowish tint, whereas the gas in another town from another gas works will give a light of a bluish tint—a light of the latter tint will make a warm-toned slide look inky black on the screen. This can be avoided with the ethoxo light.

The electric light for the lantern, however steady, is a mistake on account of its being so blue. I have put slides on that were perfectly claret colour, and on the screen they were as black as ink. But with the ethoxo light this anihilation of colour can be avoided. The tank that I have is made of stout sheet copper and tinned. When charged with fresh ether (that is, ether that has not been used for the purpose before) the light is pure, but if for another exhibition fresh ether is added to that remaining in the tank, the light will have a greenish cast on the screen, so it is as well to avoid it for the sake of a few pence. I have noticed that after an exhibition the ether that is left in the tank will throw down a white deposit. I have no doubt this may be a chlorine compound, perhaps with a trace of copper from the tank, which spoils the light. I have not yet had time to examine this deposit to see what it is. After the exhibition it is best to empty the tank at once and blow it out, and leave all the taps open for a time so as to get it perfectly dry, and use fresh ether for the next exhibition if you wish to get perfect results.

If using a binomial lantern, when the taps of the burners are once adjusted they do not require any further adjustment the whole of the evening, which is another great point in its favour; I also find, if a fair average lime be used, there is not so much pitting as with the ordinary mixed jet. I myself, like some other exhibitors, like the nozzle at such an angle to shoot a little up the lime, which is also an advantage against pitting of the lime. For this light the burners must be of special construction. In the ones I had specially made for me there is a pumice chamber just under the nozzle about half an inch deep, closely packed with crushed pumice stone that will pass through a sixty-mesh wire gauze, and will not pass through a forty-mesh, and it is astonishing how little resistance it offers to the passage of the gas, and I question very much if it is possible for the flame to pass back through it. In using this light there is no fear of unequal pressure as with the mixed gases; all coming from one bag or bottle any danger on that score is avoided. To put out the light, I turn off

the oxygen taps of the burners first, then the ether vapour, and then the taps on the tank, and finally the taps on the bag or bottle.

The light works steady and without the slightest noise with properly constructed burners, and without any variation the whole evening, and I think I may say without any more danger in careful hands. After the exhibition is over and the audience have left, blow out all the pipes, &c., at once.

There is one point that I have omitted, and that is, do not dissolve too quickly, or snapping will ensue, which had better be avoided. After the gases have been burning a short time the tank will be streaming with moisture; it might be alarming to the operator at first. It is owing to the evaporation of the ether in the tank, which rapidly condenses the moisture of the atmosphere on the cold metal. I think better results can be obtained with compressed gas in the iron cylinders than with the bag, and far more compactness, but with the bottle a governor *must* be used to keep equal pressure.

There is one thing that tells against the use of bottles, and that is the price, namely, eightpence per foot, which means a great expense for one evening. I think if a means could be found to reduce it to about one half that price it would be largely used. Carriage is an item, but I think that would be overlooked by the users if the gas was cheaper, as bottles save a lot of trouble. I believe the bottles could be returned by rail as empties to be refilled.

I for one would never make the gas if I could get it at the price named, as cylinders are less likely to wear out than bags; with the latter one never knows how soon they may give out.

WILLIAM BROOKS.

ECHOES FROM THE SOCIETIES.

At the present time, when the "Amateur question" is exercising the public mind to such an extent, it is painful to see dissensions creeping into the ranks of the oldest amateur society in the country, a society which has had a hitherto prosperous career of nearly a quarter of a century. Without discussing the details of the dispute in the Liverpool Amateur Photographic Association, there can be no doubt that a society which, by its constitution and laws, is essentially an amateur one, has a perfect right—nay, it is its duty—to exclude all members who may infringe the strict rules. But it does certainly seem to me that the proceedings in this particular case savour somewhat of inconsistency. Having winked at Mr. Ellerbeck's "offence" for some time, and actually on more than one occasion refused his resignation when tendered, it is scarcely to be wondered at that that gentleman should feel aggrieved at the sudden change of front, and more especially the manner in which the matter is brought forward. I speak purely on the facts as reported, without for one moment disputing the right of the members to expel one who is not an amateur. But it should have been done three years ago.

There is one very suggestive word in the report of the proceedings. It is stated that the action of the executive has become necessary owing to Mr. Ellerbeck's "*openly*" publishing his work. Are we to understand from this that the Liverpool Amateur Photographic Association permits, or encourages, its members to break its laws so long as they do it secretly? If so, I for one cannot help thinking that the Society is pandering to the very worst phase of modern amateurism.

In the course of some interesting remarks upon toning at the Cheltenham Photographic Society, General Dawson made a useful suggestion. Speaking of the necessity for very thorough washing of ready sensitised paper previous to toning in order to get rid of the acid contained in the paper, he stated that it is impossible to wash too much. Practically this is no doubt the case, but many operators in order to expedite matters, immerse the prints in weak carbonate of soda solution in order to neutralise the acid, and so render the toning more regular and reduce the expenditure in gold. This appears all right when the carbonate toning bath is to be employed, but it seems only reasonable that when the acetate bath is to be used a preliminary soaking in acetate of soda would be preferable, or in borax when that salt is to be combined with the gold. The salt employed in conjunction with gold in the toning bath exercises, as all know, a powerful effect on the tone produced; why not then the same effect if used as a preliminary application? If the warm tones usually obtained with acetate are desired, it is probable the object will be

partially frustrated by a previous soaking in carbonate, and the tones actually produced more closely resemble those obtainable with the latter salt. Not so, however, if the first bath be of acetate, as suggested by General Dawson.

At first sight it seems a curious discovery that was reported to the French Photographic Society by M. Franck de Villehollé, to the effect that the immersion of a plate in a solution of common salt, previous to development, acts as an accelerator. It is distinctly contrary to theory, since the first effect to be anticipated from treating a sensitive film with a soluble haloid would be to slow it. But on the principle that it is possible to get more out of an instantaneous exposure by using a developer containing soluble bromide than with one containing no restrainer, it is possible that salt employed in this manner may indirectly produce the effect claimed for it. The bromide in the one case checks any incipient tendency to fog, and permits the image to be "forced" to a greater extent than would be otherwise possible. So, too, with a plate of inferior quality, and exhibiting a tendency to fog under ordinary conditions, it is quite conceivable that a brief immersion in common salt, by restraining the fog, would produce an effect which might indirectly be described as acceleration, since with a given exposure a better and more vigorous development would ensue. I anticipate, however, that this result will only be obtained with plates of inferior quality, and that those which are originally perfect will not only fail to be benefited by it but will be actually retarded.

A question was raised before the London and Provincial Photographic Association as to the possibility of modifying platinotype prints by the addition of clouds and the like during the process of printing. I do not remember to have seen or heard this point raised previously; in fact, it appears to have been, to a great extent, overlooked by most amateurs, at least, who work the process. It is true there is a visible image produced under the action of light, but, as was pointed out by one of the speakers, it is so extremely feeble as to be of little value as a guide. It is not so much that the details of the picture are invisible, but it is the difficulty of accurately estimating the precise values of two portions of the image which, though in the undeveloped condition apparently possessing equal force, may when developed be found to be sadly out of harmony.

I can scarcely think the Chairman's suggestion of timing the various parts of the negative separately—I presume with silver paper—in order to get their respective printing values, will give much assistance in the matter. Assuming the values to be accurately taken, and that a uniform light enables the proper exposures to be given to each portion of cloud and foreground, there still remains the difficulty of dodging the joining, which, after all, is the chief one, and which requires the printer's close and careful attention. This is not a mechanical operation that a mere calculation of time, however correct, will effect, but requires the skilful treatment of a printer who knows his business. I do not mean to say—for I have had little experience with the process—that it is impossible, or even more than ordinarily difficult, to print clouds into platinotypes; but the subject is one which will bear ventilation, and those who have experience in the matter will confer a boon upon platinotype printers generally by publishing any hints which may be of value.

Apròpos of a question asked at the same meeting with regard to the early experiments of Herschel and Hunt on the retarding effect of the red rays upon photographic action, I am reminded of an amusing argument I heard some time ago on a kindred subject between two enthusiasts, who waxed particularly warm in the course of the discussion. The question amounted to this, whether or not a feeble ray of white light filtering into the "ruby" room, had really the injurious effect attributed to it by most photographers. One of the disputants held that it had not. Without claiming the reversing action attributed to the red rays by many scientists, he argued that the ray of white light in penetrating the ruby-illuminated atmosphere of the dark room, practically passed through a coloured medium, becoming itself the same colour. His opponent held that this was "perfect rot," that the ray of white light simply "diluted" the colour of the illumination, and rendered it less safe than the original colour; that, in fact, the effect would be precisely the same whether the ray passed through a ruby-tinted space or a similar distance of absolute darkness. I don't think either convinced the other, or

ever would, and as to which of the two was right, it struck me that much depended on the size of the ray of white light and the distance it had to travel whether it was injurious or not.

In the discussion which took place at the London and Provincial Photographic Association, the Chairman mentioned Becquerel's conclusions, that the rays of higher refrangibility possessed reducing powers, while the red end of the spectrum exhibited oxidising or reversing properties. Coming closer to the present date, and to a practical application of the theory, I think reference should be made to Captain Abney's successful feat of photographing the infra red end of the spectrum in 1879 or 1880. The principle upon which this was done, was, I believe, precisely that mentioned; a plate already fogged by exposure to white light was acted upon by that portion of the spectrum where the red and invisible heat rays lie, and the reversing action of these formed the image.

A simple experiment with a luminous tablet of calcium sulphide will explain this action in a very clear manner. Let the tablet be excited by means of magnesium wire, and immediately placed behind a negative in a printing frame. Cover the frame with a piece of ruby glass, and again expose the whole to magnesium or sunlight. If the tablet be now examined in the dark it will be found to bear a positive impression from the negative, the red light passing through the shadows having quenched the luminosity in those portions. A still prettier experiment consists in exciting the tablet as before, and after it has lost its pristine brightness, allow the sun's spectrum to be thrown on to it by means of a prism. The effect is most remarkable. The upper end of the spectrum becomes brighter than the general surface of the tablet, while the lower end is proportionately quenched, and beyond the limit of the visible red completely extinguished for a considerable distance by the invisible heat rays. It does not require a great stretch of imagination to believe that what occurs with the phosphorescent tablet occurs also with the photographic plate. The experiment, however, is very easy to try.

There is possible danger to film negatives shadowed forth in the report of the last meeting of the Photographic Society of Philadelphia, where a member exhibited a negative which, originally $8\frac{1}{2} \times 6\frac{1}{2}$, had been enlarged to 10×8 by merely swelling or expanding it by immersion in water. If film negatives are specially liable to this expansion, it may be found of some inconvenience, but I can scarcely see why they, more than glass or paper, should be subject to separation of the film and support. We all know that if the gelatine film be detached from its support it will, when immersed in water, swell or expand to an enormous extent, which it will not do when the support is attached. But in the case of a "film" negative the support itself seems liable to the same sort of expansion. On the other hand, however, it should be remembered that as the finished film negative is stripped, *after drying*, from a glass plate, the image proper is never in the wet state allowed to trust entirely to the flexible support. If by any accident afterwards the negative should get wet, then the trouble would begin. Probably the recent substitution of collodion for gelatine for stripping may improve matters. MONITOR.

BEAUTY OF POSE, PROPORTION, AND FEATURE IN PORTRAITURE.

[A Communication to the Edinburgh Photographic Society.]

In an old French book upon art, whose title and author I have long since most ungratefully forgotten, I remember reading a few chapters upon portraiture, in which likeness of pose, likeness of proportion, and likeness of feature were emphasised, in the order I give them, as the three chief *desiderata* in a good likeness. As the work to which I refer was written long before photography existed, and was read by myself when studying the rudiments of painting, I, at the time, saw little in the rules laid down, save that the characteristic action or pose of the subject should be broadly and thoroughly realised mentally before beginning to "block out" the proportions, and that this broad massing should, in turn, precede any elaboration of feature or detail. I was satisfied then of a fact which I had vaguely realised before—namely, that it was folly to begin by working from one feature to another in the hope that all would come right in the end; but it was not till I had taken up the art which we all mutually pursue that I fully understood the importance of a large preliminary view, for it was only then that I realised that in selecting and emphasising

what he considers the beautiful, and, at the same time, ignoring or subordinating what he looks upon as ugly, the power of the photographer is comparatively limited. When he makes what he acknowledges to be a mistake through forgetting that beauty, "grace, and, we may add, the likeness, consists more in taking the general air than in observing the exact similitude of every feature," he cannot rectify it save on a *rosa tabula*. Still, I do not see why the monocromatic "studies" of *mens* and lens should not please the beauty-loving eye better than the objective attempts at realism made by such of our brothers of the brush as have not yet found out wherein photography is capable, and wherein incapable, of taking the ground from under their feet. Setting aside colour, and tone implying colour, and also *technique* as referring to the visible evidence of handicraft, it will be found, I think, that the principles upon which the beauty of a single line is determined are applicable to every phase of criticism to which a picture may be subjected on its own merits.

To justify this statement, and thereby make my meaning clear, I would remind you that without light and shade together no form could be visible. And what we know to be true where form exists in absolute darkness, would be equally true were everything of the same brilliance. For instance, the form of the sun is lost to sight when the sky in the zenith is so bright as to dazzle our eyes. Since, under such conditions, we can have no visible form, we can have no apparent line. For, popularly speaking, a line is simply an empirical term applied to designate the impression of form conveyed by the interference of one density with another, under certain conditions of illumination. In this way we talk of the line of the horizon, a line of smoke, a line of soldiers, or a line of houses. It is only in this sense that we can speak of a line as visibly existing in nature at all. If the conditions obtaining here are equally to be applied to their artificial presentment on a plain surface, as I think they should—for what is a line of smoke beyond a charcoal line?—then, if we let a drop of ink fall on a piece of white paper, the blot will give the "line" of Euclid better than another drop which, instead of having been allowed to fall, has been regularly led over the paper with the point of a pen so as to copy the outline of the form assumed by the blot. Therefore, if when we speak of a line we acknowledge that we speak arbitrarily, and refer to what may be termed a cross between an invisible line and a visible superficies—or, in other words, as that which has length and breadth, and is visible—we would still have to acknowledge that the blot defined its own form and extent better than the copying outline, for in the outline we would have to decide whether it was its inner edge, its centre, or its outer edge which limited the magnitude. If Euclid's line be looked upon as the line of demarcation of two superficies, then the outline must necessarily cut off a portion of both or either. So, in everyday parlance, in speaking of a thick or even of a thin line, we refer to that which has breadth, and is not therefore the line of Euclid. And if we employ the term a "very thick" or a "very broad" line, we may be asked whether we would consider as a line at all a very short line drawn with a very broad pencil, so as to form a square. And if we were to reply that a square mark was not a line, and a fresh mark were made by a still shorter stroke from a broader pencil, what would we say then? Are these marks lines, points, or superficies? What is a line?

Now as I want to talk about art, and not about mathematics, I will ask you, for my argument's sake, to allow me provisionally to define a line as any mark whereby more or less isolated and fractional form is visibly indicated, a compound line being a series of salient and somewhat disjointed marks.

Composition, disposition, position, and pose, differ only in degree. They all mean arrangement, and the first mentioned includes all the rest. Composition will not allow us to deal with the position of a man as a thing of legs and arms, save after we have determined the disposition of himself and his surroundings with regard to the shape of the enclosing space wherein he is to be posed or placed. Neither will it allow us to deal with the direction of any curve or line of direction, or leading line, no matter how important, until we have roughly settled the disposition of the masses of light and shade which I wish for the time being to call principal lines (points or regions) of position. But in so far as the supposition of the existence of the smallest line gives rise to many points, so inversely from the multiplicity of these lines of position there is formed at last one line of direction, the principal line of all. With it, then, we have first to deal.

But let us see that we have thoroughly realised its existence. The eye involuntarily goes straight to the region of greatest contrast, and where a number of salient patches of strongly contrasted lights and shadows congregate, there must the eye wander. If these patches (lines of position) are all approximately of the same brilliance, size, and shape, our glance roams restlessly to and fro in search of some point of attraction greater than the rest, and if none be present, which

will possibly be the case where the lines of position have been allowed to fall at random, it will seek to discover some constellation, and, having found one, will then go jerking backwards and forwards among the points like a weaver's shuttle, laboriously and vainly striving to gyrate among them, instead of dashing about like a newly-caged bird struggling to escape.

Though somewhat mixed, this metaphor allows us very easily to form an idea of the different way in which the eye will be affected by a picture of a nice, clean, long, straight broomstick, standing erect, as opposed to the feeling produced by the contemplation of an Oriental willow-wand reposing.

Possessing some thought which he deems worthy of being embodied in a picture, the first aim of the artist is to subordinate the brilliance, size, and shape of the lines of position and direction so as to admit of the formation of one leading broad irregular, and somewhat disjointed curve composed of them all.

His next thought is where in the space he has allowed himself he shall place this curve. This he will determine by the place in this principal line of direction occupied by the principal line of position; which must be that possessing the greatest contrast in portraiture—the head or a part of it—and, by its salience, considered in relation to other points of minor interest. This line he places near the centre, and to the right or the left, as the exigencies of the occasion may require, but always above the centre. How far above will depend upon how much of the body is seen, and whether an arm forming a line of direction, or affording a line of position in the principal curve, rises above the head. In dealing with a bust, for the same reason, where the face, the principal line of position, is fronting the spectator, there will be little variation in the amount of space on either side, but when in profile the additional attraction given to the eye necessitates a greater amount of space in front of the face than behind the head; this is simply equivalent to placing the principal line of position where it was before. In the same way, if the face is looking in one direction and the body is turned in another, the principal line of direction will suggest a curve like that of the letter S, and the entire head will again be brought nearer the centre to allow the principal line of direction (S) to occupy its true position in the enclosing space.

Parenthetically, since I have made use of one letter of the alphabet, I may as well give a list of the letters and figures which, classed according to their suitability, and want of suitability, to form principal lines of direction, I once drew up in illustration.

1. Suitable types:—

G Q J S, — c s g a e t f, 9 6 2 5 3, & ?.

2. Unsuitable types:—

T X K E L I O, 8 4.

The remaining letters and figures are either repetitions of those already used, are inapplicable as tending to confuse, or else, like A, V, W and M, imply a treatment of composition foreign to that in hand, and, to my mind, less simple (I refer to the pyramidal scheme). The sign indicating the bass clef in the musical staff is perhaps the most suitable of any, and the sign indicating the treble is certainly the most beautiful. As I have stated that the arrangement of the disjointed principal line of direction, and its relations to other minor lines of the same kind and to lines of position, can be inferred from the fundamental laws which define the beauty of a single simple line, I will postpone further consideration of the most suitable curves it may assume till I come to touch on beauty of feature. One fact of extreme importance should, however, be noted: the principal leading line must—absolutely must—return into itself, *e.g.*, c & s.

The artist who illustrated *A Trip to Blunderland* showed me one day a piece of paper covered with attempts to fulfil the author's wish, and to illustrate the entry of some character—a herald, I think—as "a point of interrogation!" I have not seen the book, but, if the finished design is as clever as the sketches were, I will back that pose against that of a man standing at "tention!" for beauty of line.

(To be continued.)

HUGH BRENNER.

PLATINUM PRINTS.

THE recent yellowing of certain platinum prints under the action of sulphur, as described in these pages by Mr. Andrew Pringle, indicates that the subject ought to be investigated to the roots by those who do not care to print from their negatives at all unless they can get pictures likely to last for a few centuries at least, and by all those who feel that moral obligations rest upon the present race of photographers to adequately perform their duty as pictorial historians working for the benefit of posterity. The loss to the world of the

otherwise historical records which have faded from the surface of albumenised paper within the present generation is now irreparable, and even in the region of private life in nearly every house may be found some pea-soup looking blotches upon paper, over which the possessors mourn as all they have left to remind them of the features of a member of the family who a few years since departed this life. When a bootmaker sells boots which fall to pieces in a fortnight, the remains of those boots are not preserved in morocco shrines for years for exhibition to all comers, the more is the pity; but when a photograph rapidly fades, what is left of it is fortunately preserved as long as possible, and has the name of the issuing firm upon its back. Probably the prevalence of these yellow failures in British homes has something, but not all, to do with the present bad trade and low prices in photography. It would be well if there were more imitators of Messrs. Gézuzet Brothers, of Brussels, who for about fifteen years past have not sent out a single photograph likely to fade during a few generations; all their work, large and small, has been done in carbon, consequently many an album in Belgium must now practically testify to its possessors the efficiency with which Messrs. Gézuzet have done their duty.

To platinum, however, the relatively imperishable nature of which is well known, must all photographers turn in relation to work intended to be of historical value, and if once any one could definitely prove anything against its character for permanency, the fact would be lamentable in itself and detract from the importance of the whole of the various platinum processes. Mr. Pringle found certain platinum prints to turn yellow under the sulphur test; Mr. John Spiller had the same experience several years ago, and it was then explained that the fault was due to the presence of a salt of lead in the commercial sample of paper, the use of which salt, it was subsequently announced, would be discontinued in its manufacture.

In the early days of the history of photography Sir John Herschel discovered that the presence of the salts of lead greatly facilitated the reduction of the salts of platinum by light. In Willis's first patent, dated June 5, 1873, the sensitising solutions for his platinotype paper are described as one part of chloroplatinate of potassium in forty-eight parts of water, applied to the paper and dried; next the paper was treated with one part of nitrate of lead in forty-eight parts of water, and dried; then it was brushed over with one part of ferric oxalate, in eight parts of water, acidified with oxalic acid. Hence the finished sensitive surface contained as much lead salt as platinum salt, for which latter silver nitrate was sometimes substituted, accompanied by other modifications of the process.

In his next patent, dated July 12, 1878, he reduced the proportion of lead, and employed:—

Water	30 parts.
Chloroplatinite of potassium	1 part.
Ferric oxalate	4.5 parts.
Lead chloride	0.13 part.

In his third patent, dated March 15, 1880, he proposed to abolish the use of lead altogether, as well as of the silver salt which he sometimes used in place of lead, and gave the following formula of his sensitising solution:—

Water	30 parts.
Potassium chloroplatinite	4.2 "
Ferric oxalate	4.2 "

With the presence of traces of silver in the whites of the image one can easily see how yellowness would result from the sulphur test, or with the presence of lead how a darkening would take place which might loosely be described as "yellow;" but as persons buy platinotype paper for the sake of permanency, and to get rid of such unstable substances as salts of lead or silver in contact with organic matter, were Mr. Pringle's experiments done with prints taken before the issuing of the 1880 patent? If not, what is the cause of the yellowing? The matter should be thoroughly investigated, because if his charge could be substantiated against prints taken by all platinotype processes, their chief *raison d'être* would be demolished; the amount of their permanency would then be a matter of argument and question, instead of—as Professor Dewar assured the Royal Institution a few days ago—being an indisputable fact. Platinum would, however, still have the credit of giving more refined and artistic results than silver does upon albumen, despite the fine detail of the latter class of pictures. The colloid-chloride process, however, can be made to give finer detail, a better surface, and more permanent prints.

I have often thought that every photographic society should permanently keep a stock of standard solutions, such as those used by Mr. John Spiller for testing platinum pictures, and when prints by any new process are produced, one of them should be cut up and the strips be immersed during the evening in test-tubes containing

the solutions. Some prints would disappear in no time under tests which platinum would easily bear; such disappearance would not necessarily prove the prints to be valueless, but would give useful information forming a subject for discussion. The blue prints by the iron processes are destroyed readily by alkaline solutions, even when very weak, yet under the conditions incidental to the keeping of diagrams in engineers' offices, it is known that blue prints have much permanency—in fact, the blue darkens a little with age; at the same time there is no harm in knowing what particular agencies are most prone to damage particular classes of prints. Such tests would not give exact information as to the relative durability of the prints by various processes, but the results obtained would be suggestive in that direction. Were more regular work of general public interest such as that now suggested taken up by the photographic organizations, their influence would be increased, and the possession by each of them of a good lending library of scientific books would be as great a factor in bringing in new members as it proves to be in societies connected with other scientific subjects. A reading room containing all the photographic journals would be attractive; at present the Photographic Society only lays upon its table one periodical printed in the French language. If the refined and intellectual French nation were to be blotted out of existence to-morrow, the members of that Society would not be a jot the worse so far as concerns their present associated facilities for reading the photographic literature of that country.

The solitary periodical in the French language laid upon the table of the Photographic Society is the *Bulletin Belge*, printed in Brussels. This is, in my opinion, the best of all the existing monthly periodicals connected with photography issued in any part of the world. It is well got up, and at considerable expense it has for a long series of years published in every issue a frontispiece illustrating some photographic printing process, confining itself of late years to the more permanent classes of pictures, thus making a historical record of the progress of printing processes. Captain Abney is its English correspondent, and contributes frequent articles on the progress of photography in this country. The photographic periodicals from all parts of the world are carefully examined by its managers, and every month it prints brief abstracts of all it finds in them of most value. In all the periodicals printed in the French language, nothing personally offensive or calculated to annoy any one is ever published, and as such things are not inserted, the editors are probably not troubled with communications containing paragraphs of that description. No doubt the fact of the average popular education being five or six times higher in the more civilised Continental nations than in England has something to do with this refined atmosphere of literary respectability. The *Bulletin Belge* once printed Dr. Van Monckhoven's claim to be the originator of the platinum process, and to have discovered that platinum prints fade. I looked up his past utterances by means of the references he gave, and found that they did not substantiate his claim to priority; moreover, his statements about fading are unsupported by any other experimentalist. Captain Pizzighelli and Baron A. Huibl made a like investigation of his statements, and with the same results.

W. H. HARRISON.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 973.—"Improvements in Apparatus for Holding, Exposing, and Removing Dry Plates or Films in Photographic Cameras." M. E. T. SHERWILL.—*Dated January 21, 1887.*

No. 981.—"A New and Improved Method of Producing Coloured Transparencies." F. W. OLIVER.—*Dated January 21, 1887.*

No. 1079.—"Improvements in Obtaining Prints with the Aid of Photography, and in the Preparation of the Materials, and in Apparatus to be employed therein." C. RAYMOND.—*Dated January 24, 1887.*

PATENTS COMPLETED.

IMPROVEMENTS IN THE FORMATION AND CONSTRUCTION OF PHOTOGRAPHIC CAMERAS.

No. 2670.—JOHN EDWARD THORNTON, New Lorne-street, Moss-side, Manchester.—*February 24, 1886.*

THE improvements which are the subject of this invention, relate to the form and construction of photographic cameras, and the object of my invention is to effect a reduction in the weight of photographic cameras, by the avoidance of accessories and external requirements, or replacements of duplicates and loose parts.

In constructing a photographic camera according to my invention, I form the baseboard with an aperture or opening, the object of such an opening being for a twofold purpose, hereinafter more definitely described; firstly, for forming a receptacle for the lens or lenses; and secondly, to serve the purpose of a tripod head.

The front board or panel to which the lens is usually attached, I form of the ordinary shape externally, but with a circular opening of a suitable size through the centre. I fit into this opening a revolving panel or table, to which one, two, or more lenses are attached, in such positions that, by revolving the said table, either one or other of the lenses, as required, may have a central position, and come opposite centre of plate. The front board is supported between struts in the usual way, and with sufficient rise and fall to allow one of the lenses attached to the front board being placed opposite centre of either upper or lower half of plate. By these means a lens of the size required may be used without detaching the unrequired sizes of the lenses from the camera, and thus remains always complete and ready for use.

When the operator desires to pack the camera, the front board with the lenses affixed, is laid down on the baseboard, the opening in the baseboard forming a receptacle and packing space for the lenses, thus obviating the necessity for their removal from the front board.

In order to retain the Kinear form of bellows, I make a slight extension on the upper side of the first two or three laps.

To the edge of the circular opening in the baseboard I attach, firmly and permanently, a hollow or box-shaped metal ring, with a groove or opening in the said ring: this groove in the fixed metal ring forms a receptacle for the upper ends of the legs supporting the camera, around and upon which the camera revolves. The upper ends of the legs are retained in their position in the fixed metal ring by a spring or other suitable means.

The standards between which the front board is supported are hinged at their lower ends to a transverse bar. This transverse bar is made with V-shaped, or other similar suitably formed ends, which fit into corresponding recesses in the sides of metal racks attached to baseboard, so as to place the front board nearer to or further from the camera body for long or short focus, as desired. These racks are formed with teeth both on their upper and lower sides. A pinion working in the teeth on the upper side of racks causes the transverse bar, carrying front board with lenses attached, to travel backwards or forwards, and a pinion working in the teeth on the under side of racks operates the sliding frame of baseboard in a similar manner.

When it is preferred to draw out or close the baseboard quicker than by operation of rack and pinion, I withdraw the pinions from contact with the racks by transverse pressure on the pinion spindle, and the baseboard may then be drawn out or pushed in by hand; the pinions regain their previous positions by means of a spiral spring, which retains them always in gear with racks except when purposely displaced.

In a central position, on the under side of the camera body, I attach a plate in which I form a transverse slot: through this slot passes a set screw; the camera body may obtain a lateral movement and also the required horizontal swing, and be held firmly by means of the said set screw.

In the place of the ordinary ground-glass, I use, as a focussing screen, a suitable translucent material wound on a spring roller, which is fitted on one side of aperture of camera body; the method of using this focussing screen is the same as an ordinary spring blind, being held at one side by a fastener when required in use, and winding itself on the roller when released.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
February 1	Bolton Club	The Studio, Chancery-lane, Bolton.
" 1	Sheffield	Masonic Hall, Surrey-street.
" 1	Sutton	Society's Rooms, 18, High-street.
" 1	Paisley	
" 1	North London	Myddelton Hall, Upper-st., Islington
" 1	Holmfirth	
" 1	Glossop Dale	Society's Rms., Norfolk-sq., Glossop
" 1	Coventry and Midland	Coventry Dispensary.
" 1	Carlisle and County	
" 2	Edinburgh Photo. Society	Hall, 20, George-street, Edinburgh.
" 2	North Staffordshire	Mechanics' Institute, Hanley.
" 2	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 3	Bolton Photographic Society	
" 3	Dundee and East of Scotland	Lamb's Hotel, Reform-st., Dundee.
" 3	Glasgow Photo. Association	Philosophical Soc. Rms., 207, Bath-st.
" 3	Leeds	Philosophical Hall, Leeds.
" 3	South London	Society of Arts, John-st., Adelphi.
" 3	London and Provincial	Mason's Hall, Basinghall-street.
" 4	Derby	School of Art, Green Hill, Derby.
" 4	Yorkshire College	
" 4	Halifax Photographic Society	M. Manley's, Baram Top.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. William England, Vice-President, occupied the chair.

Mr. DIXON exhibited some of his specimens of orthochromatic prints and negatives. He said that after many months of experimenting he and Mr. Gray had worked out the process; among the facts which had struck him was the wonderful way in which the process made old pictures come out like solid objects; of this he could give no explanation, but he exhibited copies of old paintings taken in the National Gallery to illustrate his statement. In the process they used some chemicals named by a patentee, also some not named by him; some of the commercial plates in the market answered for the purpose and others did not; they were rendered orthochromatic by dipping in a bath and drying; Edwards's plates were excellent for the purpose. The keeping qualities of the finished plates were doubtful; some were as good as ever after the lapse of six or eight weeks, others went bad in two or three weeks; their rapidity was doubled by being achromatised, but when they

were used with a yellow screen the normal exposure of the plates had to be quadrupled.

Mr. J. CADETT said that Mr. Leon Warnerke had told him that ordinary plates, if used with certain kinds of yellow glass, would give almost as good results as certain specially prepared orthochromatic plates; to the eye several of these yellow glasses looked just the same, but worked quite differently when used in the photographic operations, therefore the sample of yellow glass for orthochromatic work should be specially selected.

Mr. J. TRAILL TAYLOR asked if any one had tried cyanine, the colouring matter of the violet, as a substitute for eosine in the preparation of orthochromatic plates.

Mr. W. M. ASHMAN responded that two years ago he had used alcoholic extracts of the colouring matters of various garden flowers, and had exhibited the results to that Society; it was admitted at the time that improved negatives had thus been obtained by him; among the colours he tried were those of the sunflower and of the common French marigold.

Mr. B. J. EDWARDS was pleased to give Mr. Dixon credit for what he had done in introducing the process to the notice of photographers, but it had previously been worked out and brought into every-day use on the Continent; the details, moreover, had been published more than once in this country. The case reminded him of a man who found a plough forgotten and neglected in a corner of a field, so took possession of it and used it, but it was not the finder's plough, for it belonged to somebody else all the time. The speaker here exhibited some orthochromatic photographs, several of which had been taken four years ago; one of them was Murillo's *Virgin of Seville*, which he said was a painting which it had long been thought to be impossible to copy by photography, but was at last obtained by means of one of Clayton & Tailfer's plates. The process was excellent for ordinary photographic work, and, among other things, was good for snow scenes. Tailfer's patent was published in this country on the 8th of January, 1883, and the process was described in *The Journal of the Photographic Society* of April, 1886; full instructions for preparing the plates were therein given, so there was really no secret in the matter at all; there was no difficulty about it beyond that of getting the proper eosine, for twenty-five or thirty kinds of eosine are known, and Dr. Vogel had stated that it was impossible to get a pure one in the market. A solution of the proper eosine had to be made—it should be strong enough to be of rather a deep pink colour; the plate had to be dipped into it, then washed under a tap and dried, and the whole thing was done; the only trouble was that the plates so made would not keep. His own plan was to make the emulsion orthochromatic in the first instance, and he could produce plates which would keep for years; the plates were not slower than ordinary plates or in any point inferior to them, consequently Tailfer's discovery was a great advance in photography. Mr. Dixon had mentioned that it was the subject of a patent, but if a Frenchman took out a patent in this country his rights ought to be respected; Tailfer had not been able to obtain a patent in Germany, so there the process was free and open, but not so in Great Britain. He (Mr. Edwards) had worked at orthochromatic photography in the attempt to "get round" Tailfer's patent, but it checked him at every turn, so but two courses were open to him—either to steal it or to buy it, and of course he did the latter. M. Tailfer had written to him asking that he would inform the Photographic Society and the public that he did not claim in his patent the application of eosine to photography; he claimed solely its application to the gelatino-bromide process. At the time of the discovery this was believed to be impossible, and such had been stated in print, so he (M. Tailfer) thought that Englishmen ought to give him credit for what he had done. A silver medal had been granted at the late Inventions Exhibition to M. Tailfer for his specimens of orthochromatic photography without a yellow screen, and one had recently been given by the Photographic Society to Mr. Dixon; he (Mr. Edwards) thought that M. Tailfer ought to have had both.

Mr. W. BEDFORD knew many photographers who, like himself, had tried Tailfer's process as described in his patent, yet failed to get the results, and until Mr. Wellington published some distinct formulæ a few days ago, including the use of free silver, he had been unable to succeed. It had been said that the use of a particular variety of tetrabromide of florescine was necessary. Perhaps some chemist present could tell them something about it.

Mr. EDWARDS responded that he never used free silver.

Mr. TAYLOR suggested that any one present, versed in patent law, should tell them whether a patent, to be a good one, should not so describe the invention that any skilled photographer would be able to follow the instructions and work the process successfully.

Mr. EDWARDS could bring three who had succeeded; he did not know how many had failed.

Mr. TAYLOR responded that that raised the question whether Mr. Bedford was a skilled photographer.

Mr. EDWARDS said that it had been found that the only way to make a valid patent was to include the whole eosine group, for it could not be otherwise described.

Mr. DIXON asked how a man could claim what he could not describe? The results which he (Mr. Dixon) had exhibited that evening were ten thousand times better than those exhibited by Mr. Edwards.

Mr. EDWARDS remarked that in some of those spoken of by Mr. Dixon a yellow screen had been used in the camera.

Mr. FRIESE GREENE said that if Mr. Dixon had not greased and oiled the old plough, perhaps Mr. Edwards would not have taken it up; Dixon's were evidently the best plates which had yet been placed upon the market. He (Mr. Greene) had sent some of his orthochromatic results upon collodion to Sir Henry Ponsonby, who had exhibited them to the Queen.

Mr. WOLLASTON said that at that Society they had to deal with results and with scientific effects, and not with questions of patent law. He had produced orthochromatic photographs ever since Clayton & Tailfer's plates appeared in the market. He here exhibited some specimens, one of them, he said, being a subject with which good photographers had hitherto failed to get results at all. He gave ordinary exposures, and applied ordinary developers, but he was obliged to go back to the old ruby light in the developing room.

Mr. W. E. DEBENHAM exhibited the results of his orthochromatic photo-

graphic results with the popular picture, *Sweets to the Sweet*. He had used eosine, and a yellow screen produced by coating the inner surfaces of his lenses with collodion containing eosine; he thus avoided extra reflections, and adverse optical effects liable to be introduced by plain glass screens. One of his yellow screens, however, was made of two discs of extra-white patent plate, each coated on one side with collodion containing aurine; the coated sides were then cemented together with Canada balsam, so that the yellow film was protected from injury, and the compound disc could be easily cleaned. Old pictures were usually very yellow, whilst the cracks in them reflected much white light, but the yellow screen toned down the latter, and therein he thought was the explanation of the problem of the exceptional appearance, mentioned by Mr. Dixon, of old pictures in orthochromatic photographs. Mr. Edwards claimed the use of eosine in conjunction with ammonia; his (Mr. Debenham's) plates were prepared without ammonia. He did not think that he had ever seen the reds so well rendered as by Ives's chlorophyl process. The German Government always made inquiries before granting patents, and when a discovery was not new, no patent was granted; it was desirable that some such system should be adopted in this country, in which a patent had been defined as "a right to go to law."

Mr. DIXON said that he could double the rapidity of ordinary plates, and had exhibited that evening the result of a comparative experiment.

Mr. EDWARDS stated that the speed to pure white light could not be increased, but some time had elapsed since pure white daylight had been seen in London. Mr. Dixon should test with the light of the sensitometer tablet.

Mr. INCE asked if sensitive paper films could be made orthochromatic.

Mr. HYSLOP replied that there was no difficulty whatever in doing so.

Mr. JOHN SPILLER, F.C.S., said that he had had some of the responsibility of awarding the medal to M. Taillier at the Inventions Exhibition of 1885, for he was then one of the jurors, and had as colleagues the late Dr. Diamond, Dr. Warren De La Rue, Colonel Stuart Wortley, Captain Abney, Mr. Bolas, and Mr. Bolton, all members of the Photographic Society; so he thought that in the multitude of counsellors there was wisdom, and that Messrs. Clayton & Taillier deserved their medal. They claimed the use of the eosines in conjunction with ammonia and alcohol, the latter being not altogether indispensable. The patent gave a fair description of what was known in commerce as eosine, and he thought that nobody could use eosine for the purpose but the owner of the patent. Eosine is made from fluoresceine combined either with chlorine, bromine, or iodine, or sometimes some of the nitro group are introduced. Mr. Edwards, he was informed, used tetraiodofluoresceine, a substance which might give a cross action upon a gelatino-bromide plate, as in the example of washing such a plate with iodide of potassium. It might be that there were differences in some of the eosines, but any eosine would answer the purpose to some extent, otherwise the patent would be invalidated. Mr. Edwards said that tetraiodofluoresceine answered best. That could always be obtained of perfect purity, and all samples always alike.

Mr. W. T. GOODHEW showed that by varying the development he had produced more orthochromatic results than the ordinary plates otherwise gave.

Mr. DEBENHAM pointed out that at the same time some other parts of the picture had been deteriorated. He thought that a plate made more sensitive to yellow light must be more sensitive to white light as a whole, as the latter contained so much yellow.

Mr. EDWARDS said that the enhanced sensitiveness was very small. He exhibited a coloured screen made by placing a disc of yellowed gelatine between two pieces of metal of the form of a lens stop.

The CHAIRMAN thought Mr. Debenham's plan of colouring the lenses to be admirable.

Mr. W. F. DONKIN remarked that the plates had been called both "orthochromatic" and "isochromatic," the former of which he thought to be the correct rendering, for the former meant giving the results truthfully, and the latter giving everything alike—everything an equal smudge—at least that was the idea which the word conveyed to his mind.

Mr. DIXON said that if he went to any chemist and asked for eosine, he would not give him the substance with which he prepared his plates, which plates, he maintained, were distinct from all prepared with eosine.

Mr. EDWARDS stated that Mr. Dixon's plates had been tested and found to contain eosine.

Mr. DIXON responded that it then "must have got in on the sly," he did not put it in. However, he would no longer sell the plates, as he would not risk the uncertainties of the law. The orthochromatic results he had exhibited had not been equalled in London.

Mr. SPUNCE said that at the next meeting of the Society he should partly deal with the subject of that evening.

A vote of thanks to Mr. Dixon, for bringing the subject under the notice of the Society, was moved by Mr. J. Sebastian Davis, seconded by Mr. Edwards, and carried, after which the meeting broke up.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

On Thursday, January 13, a kind of scientific entertainment took place under the auspices of the above Association at the Missons Hall Tavern, City, London, with Mr. J. J. Briginshaw in the chair. There was a large attendance, including a considerable proportion of ladies.

Mr. Watson, of Holborn, exhibited a number of scientific instruments.

By means of the optical lantern various photographic views were projected upon the screen, and changed by means of Mr. J. B. B. Wellington's lantern slide changer, which blotted out the light automatically for a moment when each change was made. One of his views, representing Haddon Hall, drew general applause from its enhanced pictorial beauty caused by the inclusion of natural clouds instead of the usual bare sky. Among the other lantern pictures projected were some by Mr. L. Medland of animals in the Zoological Gardens; some by Mr. Briginshaw, of photographs of insects; some by Mr. J. Hubert, also of insects, of which he likewise exhibited live specimens; and some slides by Mr. F. P. Cembrano and by Mr. Kingdon. Mr. York's American and Canadian views were instructive and interesting.

Music, songs, and recitations were given by Mrs. Briginshaw, Messrs. Cripps, Herbert Starnes, H. A. Bridge, and W. Cobb, after which the company parted, highly pleased with their experiences.

CAMERA CLUB.

On Thursday, the 20th instant, the subject under discussion was *The Development of Bromide Paper*, opened by the reading of a communication from Mr. Andrew Pringle. Dr. J. Foulerton occupied the chair.

A large number of film negatives and positive prints, sent by Mr. Pringle to illustrate his remarks as to the capabilities of bromide paper, were handed round for exhibition.

Mr. KIDD said his experience tallied in most respects with Mr. Pringle's, but he did not advise the use of an excess of bromide to give density. A small amount of bromide gave best results, a better colour particularly. Increase of bromide caused a brownish green colour. If from over exposure a great addition of bromide became necessary, that print would not be of much use. With a dense negative a smaller proportion of iron to oxalate should be used. He did not use acid after development, but found a plug of cotton wool, if used skilfully, and with all thoroughly in soak, rubbed off the developer and prevented precipitation of lime in the paper. As the original introducers of the bromide paper, his firm had at first found the black colour much objected to, now nothing but engraving colour photographs would be looked at. The colours given by albumenised paper were not approved by artists and people of cultivated tastes.

Mr. HERBERT FRY said he thought great care was needed in getting rid of the acid before fixing, as a very injurious sulphur action might be set up in the fixing if acid remained in the print. The acid bath was not absolutely necessary. He considered that it was important that development should be prompt, and that bromide be not used in excess if soot and whitewash effects were to be avoided; also, that in exposure distance from the light should be carefully considered and regulated by the strength of the light and the density of the negative.

Mr. ALFRED HARMAN said that the acid bath was absolutely necessary to prevent the precipitation of oxalate of iron in the pores of the paper. The picture, too, was more brilliant from the acid treatment. He then made some interesting remarks on Alpha paper. It was slower than bromide ordinarily, but gave great range of colour. When the objectionable greenish colour came it was a sign of no toning action.

Mr. WALKER agreed that the acid bath was needed, at any rate, in America. He had intended showing some sensitometer tests exhibiting density curves, to rebut the assertion that half tones were not obtainable on bromide paper, but had been prevented carrying out his full intention. Some prints by M. Nadar, of Paris, showing every graduation and great detail in the shadows, were exhibited.

Dr. FOULERTON preferred to use magnesium wire in exposure rather than paraffine or gas, and he placed his printing frames round in a circle, exposing all together at one illumination.

Mr. FERRERS said he also preferred magnesium wire, as giving more even tone, but found that exposing in a circle caused objectionable reflections across from one negative to another.

Mr. DAVIDSON, referring to Mr. Kidd's remarks, thought that it was the glaze rather than the colour in albumenised paper prints that was objected to by artists, or by anybody who looked for "quality" in pictures, and that photographs on plain salted papers and papers of matt surface generally rendered the feeling of a subject much more effectively than the ordinary albumenised paper. Colour was a matter of taste, but he preferred a warm coloured print when it was not crude. For this reason he went greatly for Alpha paper. It did not, in his hands, appear to give a certainty of obtaining warmth, though a grey could be got at will. He found his toning bath had to be much stronger in gold than that recommended or else the greenish appearance remained.

Mr. W. H. WHEELER said he found, from his experience amongst artists, that the colour of a monochrome was a matter of individual taste, the glaze of a silver print being the point of objection. Etchings of a brown colour were now highly appreciated, and a painter in doing work in monochrome greatly used sepia.

Mr. H. H. O'FARRELL said he personally did not like the warm tone either in prints or in discussion, but supposed it was all a matter of taste. Referring to a point in Mr. Pringle's paper and to one of the negatives handed round, he said the opinion of himself and many in the room was that it was not by any means a dense negative, as claimed by Mr. Pringle, but just such an one as would give a good print on any paper.

Mr. D. P. RODGERS said that also was his opinion, and he still thought that bromide paper required a thin negative rather than a vigorous one. Different makes of paper seemed to require different methods of treatment; acid was required with one maker's and not with another's; if he had a thin negative he used Messrs. Eastman's paper, if a dense one, Messrs. Morgan & Kidd's or Messrs. Fry's. In regard to colour, he had obtained a fairly warm colour on Eastman's bromide paper by the use of a soda developer. On Alpha paper he had secured, without toning, all shades between red and black by altering the developers. He would suit colour to subject—a snow scene in black and white, a sunny scene in warm colour.

Mr. H. J. GIFFORD said he would like to know what was the composition of the developed image in the argentic bromide prints.

Great interest was excited by the exhibition and working by Mr. Spiekernell of one of Messrs. Marion's (Urie's) automatic printing machines.

Votes of thanks were passed to Dr. Foulerton and to the visitors who had contributed to the interest of the evening.

The subject for Thursday, February 3, is *Artistic Photography*. Paper to be read by Mr. W. H. Wheeler at eight p.m.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The monthly meeting of this Society took place on January 13, 1887, at 56, George-street, Manchester,—The President, Mr. Arthur Coventry, in the chair.

The minutes of the previous meeting were read and passed, and the following gentlemen unanimously elected members of the Society:—Messrs. G. H. Rigby, Albert Woodbury, J. L. Barker, J. Hart, and N. Smallpage.

The PRESIDENT reminded members who intended exhibiting at the Jubilee Exhibition in Manchester that space must be applied for this month, and also that all exhibits must be framed. The Council of the Society had decided not to apply for any space as a Society.

Mr. A. BROTHERS, F.R.A.S., then gave an address, of which the following is the substance, on the *Progress in Astronomical Photography*. He said, I shall pass over the early history of the subject in a few very words. I can do this very safely because, in December, 1865, I read a long paper before the Photographic Section of the Literary and Philosophical Society on this subject, which was printed at length in the *Proceedings* of that Society, also in THE BRITISH JOURNAL OF PHOTOGRAPHY, the *Photographic News*, ten years later in the *English Mechanic*, and in two editions of *Chambers's Astronomy*. In compiling the paper I went into the subject very fully, and gave an account of what had been done up to the date named. Since 1865 a good deal has been done in America, where there are many observatories where photography is practised. Amongst others, Mr. Whipple photographed stars, and the experiment was tried on the star α Lyrae. At that time only the brightest stars could be photographed, as only the Daguerreotype and collodion processes were available. In 1867 Mr. Bond photographed the double star ζ U. Majoris, the time occupied being eight seconds. Mr. Rutherford, another very eminent astronomer in America, turned his attention to photographing stars as well as the moon with his telescope of thirteen inches aperture corrected for the chemical rays. His plan was to make a photograph, then allow the telescope to remain still for a few seconds and then take another picture. That is a good plan, and in the days of photography when spots were more prevalent than they are on gelatine plates it was absolutely necessary. This would be all very well in photographing a few stars, but would be useless at the present day. Having succeeded in photographing stars, the next subject which occupied the attention of astronomers, chiefly in America, was that of photographing the nebulae. These, relatively to the bright stars, are very faint objects indeed in the telescope. To photograph them in those days with the most sensitive surface they could employ was almost an impossibility. Mr. Draper, in 1851, had succeeded in doing it. An astronomer went from America to Cordoba for the purpose of mapping the stars in the southern hemisphere, and after doing that turned his attention to photographing them, and succeeded to a great extent. In England the Rev. Mr. Espin, sometime resident near Liverpool, gave this subject his attention. His main object was to form a means of estimating the brightness of the stars, and in this he was partially successful. Next we have Dr. Huggins, who has done much in the application of photography to astronomical purposes. He has done more in photographing the spectra of stars than anyone else. He also had an idea that it would be possible to photograph the corona without an eclipse. Every photographer knows that it is difficult to photograph a dull object in the presence of a bright one. By using coloured blue media, liquid, I believe, he cut off the blue rays and made a photograph which presented markings believed by some to be the corona. He was instrumental in sending Mr. Ray Woods to the Right, in Switzerland, to pursue these experiments at a great elevation. He was there at the time we were having those curious pink sunsets. Those who were in the habit of observing such matters could see that peculiar glow, under favourable conditions, in the brightest sunlight. This gentleman's work in Switzerland was interfered with by the peculiar state of the atmosphere, but it was supposed his results corroborated those of Dr. Huggins. Another idea occurred to Dr. Huggins. He supposed that if during a total eclipse of the sun his results agreed, he should be able to show that the moon cuts off the rays of the corona when it comes up to the edge of the sun. The experiment was made during the last eclipse, and the results were not confirmatory of Dr. Huggins's ideas. I do not mean to say Dr. Huggins was not right, but at present the question is not settled. Pickering turned his attention to the subject of photographing the stars, and got four hundred and sixty-two stars on a plate 10×8 where fifty-eight were only shown on the chart by Dr. Gould, who showed stars of the ninth magnitude. To measure and plot fifty-eight stars is a work of very considerable labour, but it is only the labour of an hour or two if we use photography, so that the saving of time is enormous. In 1860 Dr. De la Rue went to Spain and succeeded in photographing a total eclipse of the sun, and proved the point as to the red prominences belonging to the sun. These red prominences are exceedingly brilliant masses of light which appear at certain places round the edge of the moon, very beautiful and generally of a rosy tint. They were a great mystery; nobody could tell what they were, and they could never be seen excepting during an eclipse, and the thing to prove was whether they really belonged to the sun. On photographs taken at the beginning of the eclipse the red prominences were seen on one side and at the end of the eclipse on the other side. As the moon progressed across the sun's disc the red prominences were covered up, thus demonstrating that they belonged to the sun. This proof is not needed now, the spectroscope reveals those objects without the assistance of an eclipse. About 1870 there was much speculation among astronomers as to the nature of the corona; some said it could only be an effect in our atmosphere produced by the light striking the edge of the moon, and had nothing to do with the sun. As photography settled the matter of the red prominences, it was naturally supposed that it might settle this. The Royal Astronomical Society, aided by the Royal Society and the Government, resolved to test the matter, and I had the pleasure of helping. I knew that all previous attempts to photograph eclipses had been made with the telescope, and how very difficult it was to take pictures with a telescope, the lenses in which were not corrected for the chemical rays. It occurred to me that the most sensible way was to photograph the eclipse as you would a landscape. I made inquiry to get the largest aperture lens I could; Mr. Dallmeyer had the only available instrument, and kindly lent it me, and with it I made some photographs. It was very lucky the whole thing was not a failure, as the clouds only just cleared away in time, leaving me only thirteen seconds of clear sky before the eclipse ended. The photograph taken at this time, when compared with others taken one thousand five hundred miles away, settled the point as to the corona being an appendage of the sun. The method I adopted in this instance has been used ever since in photographing

eclipses of the sun. I now come to speak of the work done in France by M. Janssen, at Mendon, and Messrs. P. and Prosper Henry, at the Paris Observatory. I may also say there are gentlemen at work in England pursuing the same line of work, and though I cannot show you very much of what they have done in stellar work, I can show some very beautiful photographs by Mr. Common. M. Janssen has given more attention to photographing the sun. I have here a photograph of the sun's surface, showing a very large spot visible to the naked eye in 1885. In this place, about twenty-five years ago, Mr. Nasmyth communicated a paper on the subject of the sun's surface, to which very little attention had been given before. Sir John Herschel and others had observed that the sun was not a smooth surface, but was broken up. Nasmyth said the surface appeared to be covered with objects like willow leaves. This called the attention of astronomers to the matter, especially the Rev. W. R. Dawes, who compared the appearance to a thatch of straw. Mr. Langley made a very beautiful drawing of a sunspot. Dr. Huggins made one totally different. But although they were all dissimilar I think all the observers mean the same thing, because one which is enlarged from the one I have passed round is so exactly like Dr. Huggins's drawing that one might almost say the same hand had drawn it, though one is a photograph and the other a drawing. It may be called the mosaic pattern. M. Janssen, in pursuing this subject, came to the conclusion that photography could do more than it had hitherto done. I will translate a few words from a paper he has sent me. M. Janssen says, "In a note presented to the Academy of France in December, 1877, . . . I said that photography offered not only, as is believed generally, the means of fixing luminous images, but that it constitutes a method of discovery in the sciences, and especially in astronomy. I added that the sensitive photographic plate, by reason of its admirable property of giving fixed images and rays much more extended than those which affect our retina—in fact, permitting the accumulation of radiations during a time more or less unlimited—that this sensitive film, I said, ought to be considered as the true retina of the scientist." Since the time this remarkable passage was written the Messrs. Henry have been busy photographing the stars. I will send round three photographs of parts of the constellation Cygnus, which contain stars down to the sixteenth magnitude, and to produce the negatives the exposure was from one hour and a quarter to three hours. You will notice that the stars at the corners are drawn out in the direction of the centre. That must be through a defect of the lens. I do not know that it diminishes the interest of these photographs, but if it should have the effect of lengthening the distances of the stars a great part of the plate could not be utilised. It requires one of the largest and most perfect instruments to show stars of the sixteenth magnitude. A star is really only an optical point, and has no disc. No stars, not even Sirius, have discs, but you see these have. The length of exposure must be the cause of it, as the more you expose the more the rays spread. Mr. Common used a reflecting telescope of about three feet aperture and thirty-six feet focal length, and of course he was working under very different circumstances.

Mr. Brothers then proceeded to the demonstration with the lantern, when he showed photographs illustrating the various matters referred to in his address. The point referred to in the passage quoted from M. Janssen's paper was illustrated by a photograph of the Pleiades, in which a nebula was discovered which had never been seen in any telescope. Mr. Brothers also thanked Messrs. Janssen, Henry, and Common, for their very beautiful photographs which had assisted so materially in illustrating the subject of the address.

Mr. J. S. POLLITT said in Norman Lockyer's work on solar physics the plan of blocking out the sun was recommended, and it stated that the red prominences were photographed by that method, not using a blue medium, but by a mask in front of the lens and taking the photograph in that way.

Mr. BROTHERS said the red prominences had never been photographed without an eclipse, but when the polariscope was used they could be seen.

A hearty vote of thanks was accorded to Mr. Brothers for his address. Dr. C. P. BAHIN exhibited some samples of Willemsden paper, and explained its manufacture and its usefulness in various ways to photographers.

Mr. J. B. ROBINSON said he had made a developing dish of the paper, but it had spoiled his pictures.

Mr. Edwards exhibited a roller slide constructed by himself, and Mr. H. M. Whitefield a camera of novel construction which he had personally constructed, and which was considered by the members a clever piece of work for an amateur.

At the conclusion of the meeting there was an exhibition of small cameras and tripods, &c., from various makers, including Watson & Sons, Marlon, W. Watts, S. D. McKellen, J. Billeliff, J. A. Furnival, Hopkins Brothers, Chapman & Thornton, besides other exhibits in apparatus from Clubley & Preston, Morgan & Kidd's roller slides, &c.

After the Hon. Secretary had introduced all the exhibits which had been sent from a distance, and whose representatives were not present, the formal meeting was adjourned, and the members walked round inspecting the numerous things of interest, and it was a late hour before the room was clear, after a most interesting and enjoyable evening.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

THE annual meeting of the above Society for election of officers and exhibition of lantern slides by members was held in the Old Town Hall on Wednesday, the 12th instant. There was an excellent attendance of members and ladies.

The minutes of last meeting were read and confirmed and one member proposed.

The election of officers was then proceeded with, and resulted in the following:—*President*: Mr. George Bankart.—*Vice-President*: Mr. C. Underwood.—*Treasurer*: Mr. W. Sculthorp.—*Committee*: Messrs. Toller, Sculthorp, Tucker and Broadhead.—*Hon. Secretary*: Mr. H. Pickering, High Cross-street.

The accounts were then presented, and having been previously audited by Messrs. T. S. Taylor and W. Broadhead, and found correct, they were passed and the Committee have pleasure in reporting a balance of nearly £5 in hand at the close of the first year of the Society's existence.

The lantern exhibition then commenced, Messrs. T. S. & W. Taylor, Manufacturing Opticians of this town and members of the Society, working their

binial limelight lantern on an eighteen-foot screen, which was admirably managed and gave brilliant pictures, and brought out the slides in a very efficient manner.

Where all are good it is invidious to particularise, but the slides of Messrs. Tucker and Weatherhead were excellent and left nothing to be desired; there were slides exhibited also by Messrs. Broadhead, Taylor, Underwood, Alsop, &c., illustrating the various modes of development and exposure. The best slides of the evening were those reduced from whole-plate to lantern size.

After a hearty vote of thanks to Messrs. Taylor for their kindness in working the lantern, the company dispersed, after a most enjoyable evening.

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

The annual meeting was held in the College of Physical Science, Newcastle, on Thursday, the 13th instant, at half-past seven p.m.,—Mr. J. Downey in the chair.

After the usual routine business, Mr. Hinton Shand was elected a member. The voting papers for President and Council for 1887 were examined by scrutineers and the result announced as follows:—*President*: Professor A. S. Herschel, M.A., F.R.S., &c.—*Vice-Presidents*: Mr. J. P. Gibson, Hexham, and Mr. J. Downey, South Shields.—*Hon. Treasurer*: Mr. P. M. Laws.—*Hon. Secretary*: Mr. J. Pike.—*Committee*: Messrs. Auty, Galloway, E. Sawyer, Loyd Sawyer, Procter, Robson, Sinclair, Templeton, and Schumann.

The SECRETARY read the sixth annual report, and the TREASURER made his statement of receipts and expenditure for 1886; these were passed.

Mr. J. P. GINSON proposed a vote of thanks to the President and officers for their labours during the past year. This was put to the meeting and carried with acclamation.

A discussion followed on orthochromatic photography, in which Messrs. Gibson, Galloway, Downey, the Secretary, and others took part.

Two questions found in the question box were considered and the meeting adjourned.

SIXTH ANNUAL REPORT.

Gentlemen,—In accordance with our rules, I beg to hand you the Sixth Annual Report.

Early in the year it was unanimously decided to hold an exhibition of photographs, open to all amateur and professional photographers, at the Art Gallery. It having come to the knowledge of your Council that a Royal International Exhibition had been resolved upon for the Jubilee Year 1887, at which exhibition a special photographic section would be a feature, your Council considered the matter further, and came to the conclusion that it would be better to postpone our exhibition and join the Jubilee Executive in their endeavour to get together a good collection of photographs. In furtherance of this object, our Society provides for open competition gold, silver, and bronze medals. The editor of the *Amateur Photographer* also contributes a medal for amateur photographers, and I am glad to state that there is every prospect of a highly interesting and successful exhibition.

Papers have been read this year and demonstrations given by Mr. Cozens Way, the Rev. T. F. Hardwich, Professor Herschel (twice), and Mr. Pike; Mr. Jackson and Mr. Macleod gave at the January meeting a demonstration of lantern slides. A Scepticon lantern has been presented to the Society by Mr. Muling. Contributions of books also by the President and the Rev. T. F. Hardwich, M.A. The thanks of the Association are due to the above-named gentlemen, also to the editors of the *Photographic News*, *THE BRITISH JOURNAL OF PHOTOGRAPHY*, *Amateur Photographer*, *Anthony's Bulletin*, *Photographic Journal*, and *Photographic World*, for journals and papers.

We have enrolled nine new members this year; on the other hand, we have lost two by death and seven by resignation.

Outdoor meetings were held at Jesmond Dene, North Shields, Rothbury, and Staward Peel. They were not well attended, the weather being very unsuitable for photographic purposes.

The expenses in connection with the exhibition are expected to be heavy, and although the Society expects to be reimbursed somewhat by the receipt of entrance fees, and can show, as will be seen, a very fair balance, it may be necessary to make a special effort to meet the extra expenditure. Several members have already contributed to a fund for the purchase of a "die," from which medals could be struck for this and any other exhibition it may be desirable to hold, but further contributions should be forthcoming before anything can be done in this direction.

In conclusion, it is desirable that all members should endeavour to take part in the Society's ordinary meetings by contributions of papers and discussion of various matters of interest. The question box is provided for the purpose of eliciting answers to questions sent by any member who may not be disposed to raise his question in open meeting. Members are also at liberty to bring a friend to the meetings.

Trusting to receive in due course promises of papers, &c., for the Society's meetings,

I remain, Gentlemen, yours faithfully,

J. PIKE, Hon. Secretary.

General Statement of Receipts and Expenditure for 1886.

RECEIPTS.			EXPENDITURE.				
	£	s. d.		£	s. d.		
To Balance from last year	14	17	6	By Printing	3	12	0
" 2 Subscriptions for last year	1	1	0	" Postages and Stationery	3	16	4
" do. for 1885	25	14	6	" Expenses at Meetings	1	7	2
" 1 do. for 1887	0	10	6	" Attendance of College Janitors	2	10	0
" Contributions from Professor Herschel, Messrs. Way, Pike, and McLeish, towards providing die for medals	2	12	6	" Loss on Association Conversation	1	11	6
				" Balance in Bank	£29	17	0
				" Do. in hand	2	2	0
					31	19	0
	£44	10	0		£44	16	0

P. M. LAWS, Hon. Treasurer.

Examined by E. SCHUMANN.

SUTTON SCIENTIFIC SOCIETY.

THE Photographic Sub-Committee of the above Society gave a most successful soirée on Thursday, the 20th instant, at the Public Hall, Sutton.

About four hundred and fifty visitors attended and seemed to greatly appreciate the efforts which were made to amuse and interest them. In the intervals

between the showing of slides in the optical lantern there was music in the shape of glees, solos, and instrumental pieces. The Geological Sub-Committee also kindly arranged a small geological exhibit, which had many visitors.

Turning to the photographic exhibition itself, it may be said that the Sub-Committee succeeded in bringing together a most interesting and even important display. The members themselves almost filled one side of the hall with frames of their own works, amongst them being excellent local and other views by Messrs. Ackland, Cathcart, Chivers, J. and F. Curtis, Poster, Goode, Jacques, Perrott, Wilkins, Wormald, and Mrs. Culverhouse. The most interesting of the frames contributed by friends included many splendid pictures; some views of Japan and others of Niagara Falls, lent respectively by Dr. Dresser and Mr. Walker, may be mentioned. The London dealers and manufacturers were also well to the fore.

The soirée broke up about half-past ten, and the Executive Committee—Messrs. Good, McCance, Cathcart, Chivers, and Perrott—may be congratulated on having organized a very successful evening's entertainment.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE third meeting of the current session was held in 20, George-street, on January 5, at eight o'clock,—The President occupied the chair.

Thirteen members were admitted.

Mr. H. BRENNER read a paper on *Beauty of Pose, Proportion, and Feature in Portraiture* [see page 53]. He illustrated his remarks and added to their interest by outlines and sketches on the blackboard.

Mr. S. Tamkin sent a short paper on *Photographic Society Table Talk*, which was read.

A roll holder sent for exhibition by Mr. J. M. Turnbull was explained. It was pointed out that in this holder no third roller is needed, the paper roll being contained in a receptacle from which it is paid out as required. The manner in which the exposures are marked off is an improvement over that of marginal prickers, which sometimes miss. Whenever the slide is drawn to expose, two perforators are released which puncture the centre of the paper at the limit of the exposure.

Mr. F. BRIGLLEN submitted a mechanical contrivance which might be styled an adaptor front for the camera. The object of it is to furnish a handy means of holding securely in position for any temporary purpose lenses of different sizes. Two sliding metal panels with V-shaped openings are made to approach and grip the lens, so that it is held at four points; and, in order to close the small openings left, a square piece of sheet rubber with a circular hole in it is fitted over the lens, and the whole kept tightly in position by elastic bands. The idea was favourably remarked upon.

A sample of a very translucent material termed "glacier" paper was handed round, kindly sent by the makers. It was examined in view of the possibility of utilising it as a support for gelatine emulsions. It is thicker than the tissues usually employed, and was affirmed to be impervious to watery solutions.

A number of ceramic enamel portraits of great beauty and softness, by Mr. J. G. Tunny, were exhibited and were much admired.

Messrs. Sturn & Co., Bremen, sent the illustrated prospectus of their new "secret" camera, for use under the vest, and described as "the newest invention upon the sphere of photography." This apparatus is declared by its German inventors to be extremely light and warranted capable of carrying ordinary dry plates. It is intended to be hung round the neck, the exposures being made through a buttonhole.

Mr. W. CROOKE remarked that the instrument was doubtless efficient enough, taking six pictures on one plate, but it was inconvenient that circular plates were required for it.

Correspondence.

Correspondents should never write on both sides of the paper.

PERMANENCE.

To the EDITORS.

GENTLEMEN,—I wish to call your attention to a fact which seems to be entirely overlooked in the controversy which is at present raging in your columns as to permanency in prints by various processes. The point which is neglected, and in which the essence of the dispute really lies, is the nature of permanency which is claimed for prints both by bromide and platinotype methods.

One gentleman, for instance, exposes prints by both processes to an atmosphere of sulphuretted hydrogen, or soaks them in some other chemical which would destroy almost anything which comes in contact with it; and then when the print becomes discoloured or fades altogether he flies to announce that this or that is not permanent.

This course of testing would be perfectly reasonable, I admit, if photographic albums consisting of baths of nitric acid or blotting-paper soaked in ammonium sulphide were in fashion; but it not being so, this is only begging the question.

The public do not wish to have prints which can withstand the united effects of the contents of a druggist's shop. We simply want them to be able to resist the effect of town air (say, London air, as I think that is the most impure) combined with damp. That is to say, that a print which will withstand for an infinite period an exposure to oxygen, nitrogen, water, and an extremely diluted gaseous admixture of sulphuretted hydrogen and ammonia, has, in my opinion, at least a legitimate claim to be entitled permanent. This can only lead to one conclusion, and that is, that both gelatino-bromide pictures and

platinotype prints on paper, if properly executed, are to all intents and purposes permanent.

But platinotype has a decided advantage in this race for longevity, because this permanency is obtained with greater facility. A bromide print may very likely fade on account of insufficient washing, but with a picture in platinum this is not the case. A few rinses in acidulated water, and a wash for a minute or two under a tap, and you have a print that will, without the slightest doubt, withstand the test I have mentioned. But a bromide picture must be carefully fixed—"not too much" hypo, "but just enough"—and then as carefully washed until every trace of this hypo has been eliminated.

The result with the bromide process in nine cases out of ten is that the amateur finding his prints fade would blame the process and not his manipulation, and so platinum would get the credit for a superior permanency which it does not possess, both processes yielding results which are permanent in reality; but in one case these are obtained with but slight trouble, while the other needs a tedious and prolonged washing to insure this permanency.

Whatever may be said by the opponents of Mr. Willis's beautiful process, who are, I have noticed, in most cases interested parties, it is growing rapidly in favour day by day amongst both professionals and amateurs, which is a sure test of the quality of its results. That platinotype, like good wine, "needs no bush" being my opinion, I will conclude.—I am, yours, &c.,
VOX POPULI.

Peterborough, January 22, 1887.

To the Editors.

GENTLEMEN,—Were it not for the occasional scraps of useful information that crop up from time to time, discussion on this threadbare subject might long ago have been discontinued, perhaps with advantage. In your last issue Mr. H. B. Berkeley continues to dwell on the respective indestructibility of metallic platinum and silver, whose relative qualities have been well known ever since platinum was discovered. The real gist of the discussion is quite outside this, and I contend that the permanency of platinum, silver, or any other kind of print can scarcely be judged by comparison with anything else; each has a standard of its own. Mr. Berkeley has taken trouble to show that certain agencies will destroy silver prints and not platinum ones, which nobody does deny. If we know that certain preventable influences act prejudicially we avoid them. What would be thought of any one possessing a choice and valuable object if they always placed it in conditions to test its indestructibility? Usual people take care of such things, and if we know that by certain precautions we may prolong the existence of them for an indefinite period, we do so.

Now this applies to a good, properly prepared silver print, which I am perfectly convinced, if Mr. Berkeley is not, that such a print will, with proper care, last as long as shall fairly entitle it to be called permanent. My idea of non-permanency is, that the print shall in itself contain germs of destruction that will, no matter what care is taken, eventually cause the picture to commit suicide, so to say. If, however, a picture is only destroyed by outside influences from which careful storage will protect it, that picture is of itself undoubtedly permanent to all intents and purposes. Whether platinum or carbon are more so, has little bearing on the matter.—I am, yours, &c.,
EDWARD DUNMORE.

SULPHURATION OF PLATINUM AND OTHER PRINTS.

To the Editors.

GENTLEMEN,—I am much pleased to see the logical and discriminating way in which several writers have treated my little experiments on the sulphuration of prints, and in particular I thank Messrs. Beckett Lloyd and J. Martin for the light they have thrown on the matter. The quotation by the latter gentleman from the late Mr. William Shakespeare is most appropriate, and quite worthy of the subject. I quite agree with Mr. Martin (1).

One or two points have lately struck me as curious. First, everybody seems to think that I claim to have sounded the knell of platinotype. Nothing is further from my imagination. I think I have rather given it a lift. Before I published my experiments we had only assertions as our grounds of belief in the durability of platinum prints, now we know to what strong measures I had to resort before I could destroy the prints. Some people seem to assert I have not destroyed them yet, and they may be correct; I shall allude to that point shortly.

Another thing that strikes me as curious is that several people have written to me that they knew long ago that sulphuration would destroy platinotypes. Perhaps these gentlemen will come to the front now.

A few words on Mr. Lloyd's paper. He is quite right when he says that I wrote of the effect produced upon the prints as "yellowing," not as fading. In every case the colour was darkened, not "faded." But one little point has apparently been overlooked by everybody who has written. The blacks of the platinotypes appear unaltered because they are black. The effect may be there—I believe it is there—though we cannot easily detect it, because we cannot blacken or darken black. I think the blacks—that is the images—are affected. They are a different colour from what they were. This effect was more evident on the bromide prints; the dark parts of them were greatly changed, though they still

remained dark. In platinotypes the effect on the blacks is perhaps better seen after immersion in acid sulphide of potash. My great regret is that none of the gentlemen who write on this subject seem to have made experiments themselves, as I hoped and requested my readers would do. It is plain that this question must be settled before we go any further: Are the blacks really unaffected, or is it merely the case that we cannot detect any effect on the image? I pointed out the fact that while the back of the paper was apparently unaltered, the whites (at least) of the front are yellow. I admit at once that if the effect is produced only where there is no image, the image cannot be suspected but the salts were at one time all over the front; how is it that now the front is affected and not the back? And I ask the question, for I am no chemist, is it quite certain, as some seem to assert and some to believe, (1), that the image is pure platinum alone? and, (2), that the white parts are ever entirely freed from the chemicals they undoubtedly at one time contained? Is it certain, is it indeed credible, that the whites have no kind or no amount whatever of passive action in the processes of printing and development? Granted that the light and chemical actions in the whites are very small and imperceptible, are we to take for granted that no action at all took place there? And if there is a reduction, however light, in the whites, we have again to ask the question, How is that the whites of the front yellowed while the back did not? Mr. Lloyd assumes, he says, "that the change in appearance of the platinum prints is confined to the paper," and he further takes it for granted "that the image itself remains wholly intact, since, from an experiment with bright platinum foil, H₂S seems to exercise no action on the metal." But I submit that we have no right to assume either that the change is confined to the paper, or that the image is pure platinum. I deny the first, and I ask proof of the second assumption. We have had enough of assumption in the matter.

Every philo-platinist surmises that the platinum prints I tested were not properly cleared of iron. I cannot answer "yea" or "nay" to this. I can neither deny nor own the "soft impeachment." I cannot of course state where I got the prints, but they were produced, as I said, one by an amateur of large experience in platinotype, the other by a gentleman who produces platinotypes commercially on a very large scale, as I understand. This, however, I will say: I myself soaked one of the same batch of prints (the commercial ones) in pretty strong HCl, and then washed it under a rose tap, and destroyed it utterly with acid KS. But I cannot swear that even my operations removed the iron. Considering the circumstances under which I produced the test bromide prints—they were utterly under exposed, and made long before I thought of testing them or anything else—the odds are about a hundred to one that neither the iron nor the hypo was entirely eliminated. But that has nothing to do with the matter; I am not now comparing bromide with platinotype, for I satisfied myself that so far as sulphur is concerned bromide prints have nothing to fear. My writing has, as some one says, done at least one good thing, it will be a warning to platinotypists to eliminate the iron. There is not the slightest doubt that if any iron remains in a print, and any sulphur has access to it, there will be mischief, just as surely as if any hypo is left in a print and sulphur gets at it. Mr. F. M. Edwards of the London and Provincial Photographic Association, a high authority on platinotype, said that when the HCl had fairly done its work it was "impossible for the prints to yellow under tests." He also produced prints and declared himself able, or believed himself able, to remove "any yellowness produced by chemical action on a platinum print." So the yellowness can be produced, but can, if produced, be removed. I regret I did not obtain one of the prints. I do not say I could stain it, but I should like to try my hand on a print above all suspicion of iron. If anybody will send me such a print I guarantee that I shall publish the results of my tests.

It is to me a real pleasure to discuss a matter with men who write and talk to the point, with such men as Mr. Lloyd, Mr. Martin, and Mr. Edwards. Even though we disagree, even though we fail to convince each other, there is a pleasure and a gain in ventilating the subject.

By private communication I have become aware of certain criticisms on my paper all proceeding from persons who evidently have not read my article carefully. A few words may be allowed to reply to them.

I do not deny, on the contrary, I assert, that platinotype is what we call a "permanent process." I do not deny, on the contrary, I asserted, that my test was practically severe, "out of all reason." My object mainly was to test bromide, not against platinotype but against albumen; this on account of an assertion made by a certain writer in these columns. Finding an action take place on the platinotypes I pushed my test further, in fact, beyond all reason. But in fairness I tested bromide as I did the other. Personally, I do not care a cent whether platinotype is durable or not.—I am, yours, &c.,
ANDREW PRINGLI.

ORTHOCHROMATIC PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—I really cannot allow some of the remarks made at the London and Provincial Photographic Association to pass without a word of protest.

Mr. B. J. Edwards says, "By gaslight a (Tailfer's) orthochromatic plate is nearly twenty times more sensitive than an ordinary plate." Now I happen to have been testing different dry plates (about twenty-five

makes) with the best standard light ever proposed, and with Warnerke's sensitometer. I have used for years a No. 5 Bray's special gas-burner, burning, by Joslyn's indicator (Sugg), three feet exactly per hour. Although I have tested over one hundred plates of the same batch (Wratten's), I have never found my standard burner vary in the least.

Now, Tailfer's plate gives twenty-four on the sensitometer exposed to gas; three other makes of plates give the same, none of them orthochromatic; but one plate (Ilford), and one only, gives twenty-five, and so clearly that it would certainly give twenty-six if there were such a number. I should say that I have found that an exposure exactly five feet away from the above-mentioned burner, gives the same result as the sensitometer tablet with magnesium, but the former is far more reliable.—I am, yours, &c.,

F. P. LEON.

Woodlands, Clarence-road, Clapham Park, S.W., January 14, 1887.

THE PHOTOGRAPHIC EXHIBITION.

To the Editors.

GENTLEMEN,—I was pleased to see Mr. Pringle's letter in this week's JOURNAL, as I have been on the point of writing on the very subject he has taken up. Instead of getting better, things actually get worse each year. After much pressure being put upon me by the Secretary, I became a member of the Society, the advantages of course being pointed out which a country member living two hundred miles away would be supposed to have. At last I reluctantly consented to become a member, but I have not been able to discover the advantages, but certainly have found the great disadvantages. Since I became a member I have sent up to two Exhibitions twelve frames of photographs 15 x 12, each time along with a numbered list and a letter requesting that, however many were hung, they should be taken consecutively, as I had numbered them according to their merit as pictures. However, my instructions were entirely ignored, and the worst pictures were hung and the best put into limbo, and, to add insult to injury, the best of those that were hung were put at the back of a screen where nearly total darkness reigned. It was utterly impossible to see what any picture was like that was hung at the back of those screens. Whose idea it was to utilise the backs of those screens I don't know, but they could not have selected a better means to insult an exhibitor than by hanging his pictures on it; but I was a member, and of course it did not matter. The remainder of the selected pictures were skied and floored respectively.

I have put myself to considerable trouble and expense to please. The year before last I sent up for the pleasure of the visitors a large size stereoscope with the result related in a previous letter. The last Exhibition I sent a frame of 15 x 12 transparencies. I also sent between forty and fifty lantern slides for the Monday evening entertainments, with the result that some of the best were missing when returned, which was not till long after the Exhibition closed, and after repeated letters were written asking for their return, and when they did come there was not a word of explanation or reference to the missing ones, nor even a word of thanks in any shape or form; not much encouragement for any one to oblige by sending anything to the Society for exhibition.

I sincerely hope that something will be done before another Exhibition to remedy the defects of management. I don't know whether it is one of the *privileges* of country members to have a say in the election of officers, but I can say that I have had no opportunity of using that privilege, having never seen a voting paper.—I am, yours, &c.,

H. FONSTRI.

31, Bank-street, Bradford, January 22, 1887.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

To the Editors.

GENTLEMEN,—In your issue of the 14th instant appears a letter by "A Country Member," discussing the shortcomings of the Council of the Society, the temptation to answer which I successfully resisted at the time, but as in your last number Mr. Andrew Pringle, in a whirl of metaphor, exaggeration, insinuation, and oracular utterance, renew the assault, I shall be glad of a little of your space to examine and comment upon the statements made and the inferences therefrom. Let me only premise that anything I have to urge by way of defence, or explanation, is to be regarded as simply the individual opinion of one who happens to be both a member of the Photographic Society and of its Council.

In order of merit, as well as of style, allow me first to deal with the letter of "A Country Member." His communication, both in style and matter, is calm and reasonable; if severe on certain points, it is only from want of fuller information. He does not aim to be spiteful, nor is he careless in allegation, but writes, I do not doubt, from his point of view, in the interest of the general body of members. He is willing to admit that the Annual Exhibition, at least, is managed with skill and intelligence enough to be of service to the members; and of interest to the public, and, in short, he writes without excited opinionativeness on matters that admit of argument, and in a manner that befits a gentleman. I feel the under-current of desire to be just so perceptible in "A Country Member's" remarks, that I am sure he would not have written "sharing with the retiring Vice-President the unenviable distinction of being absolutely at the bottom of the list" (of attendances) had he known that Colonel Stuart-Wortley has been disabled from assisting at the Council

Board throughout the session by a severe and painful accident. Further, had he known that our staunch friend, H. P. Robinson, underwent, at the close of 1885, a tremendous and most dangerous operation, that for days he hovered on the borders of "the Valley of the Shadow," that for weary months he was a great sufferer, and that his recovery is almost a miracle, he would have signalled the one attendance (travelling sixty-nine miles for that) as equal in interest and merit to any other person's seven. Here I faint would (and metaphorically do) shake hands with "A Country Member," and proceed to examine the arguments in his letter.

The first point is the question of attendances at the Council table, which your correspondent appears to think discreditable and a sign of danger and decay. He surely can have had little practical acquaintance with committees, or he would have seen at a glance that at the eight meetings of the season there were ninety-one attendances; that is to say, the President faced, on each occasion, an average of more than ten Councilmen, and if eleven elected representatives are not considered by him a sufficient number to confer on and determine the affairs of the Society, I think he only needs experience to correct his impressions. In the constitution of the Society, five members of the Council and the Chairman constitutes a quorum. Does "A Country Member" know of any society that expects to get all its committee together on ordinary occasions? Is he not aware that the legal quorum is always much below the total number of members, so as to allow for the contingencies of life and time, and secure a working average? Is he averse to the honorary election of a few members, who, having distinguished themselves in the science or the art of photography, confer some lustre on a council by joining it? Such men do not, as a rule, attend ordinary meetings, but yet represent reserved efficiency. For example, J. M. Swan, certainly a luminous name in the history of photography, was a member of Council, 1883-4-5. His attendances were few, but it was perfectly understood that in any emergencies of the Society he would have answered to the summons, and given time, thought, and, if necessary, money to serve it. The venerable Francis Bedford affords a similar example. I feel confident that if "A Country Member" will try, he can conceive that a society may wisely elect to its council some of its best friends, and not demand attendance at every business meeting. If this be so, and the questions I have asked above have any pertinence, then he will plainly see that his impression from the list of attendances by no means warrants the inference drawn, that "it is impossible to have a stronger argument against the continuance of the obsolete and absurd rule under which members of Council are elected." Instead of the attendances having been weak, they have been regular and strong.

As to annual election of the whole Council, that is a fair subject of consideration, although my friend has advanced no facts or arguments in support of his own view; perhaps he will furnish these in another communication to the Editors? On the other side, may be pointed out the fact that the annual retirement of one-third only of a council maintains a continuity of management, conserves experience, and is a guarantee from rash and intemperate change. It is also found expedient, for out of the 450 members of the Photographic Society, of whom a large number reside far away from the Metropolis, there is but a limited area of selection. The Council absorbs twenty-three members. These twenty-three to be worthy of the position must have qualifications of practical art, or scientific knowledge, or business aptitude, connected with photography; they must have a recognised social position, be able to work harmoniously together, and possess the confidence, at least, of large sections of the members. Further than this, they must be willing to serve, to give thought and time to the duties required, to accept the responsibilities of finance and of the Exhibition, and finally, must possess some crowning virtue of patience, so that after having done their best to save the Society, they may receive with celestial calm the railing accusations of any member with a bee in his bonnet, be he fiery Scot, or disappointed exhibitor, or both. Let "A Country Member" sit down, erase the present Council, and make out a list of twenty-three other members of the Society who can be depended on to serve and answer these conditions, and let us see his list in next week's paper! The natural limitations under which any Society works are soon perceived; no council, especially if it takes charge of an exhibition, can please everybody; a wise council does not try to please anybody, but simply endeavours to fulfil the duties undertaken, to the best of its ability, quietly certain the issues will not shame them.

But "A Country Member" need only to read the constitution of the Society to find that it is essentially democratic; that *all* the power is in the hands of the members. Its laws were made by the members—not by the Council; the laws can be altered or abrogated; and when he writes of the Council's "self-assumed prerogative of absolute government," he writes a resonant phrase, but with sound only in it, not sense.

As a step towards more fully understanding each other, will "A Country Member" kindly state, with particulars of date and circumstance, those suggestions of much-needed reform which have been made to the Council and which as a body it has opposed? There is nothing definite with which to grapple in a vague statement of this kind. It may impress unthinking people with a sense of fatuous obstinacy indulged at headquarters, but it cannot facilitate any reforms that are to be desired.

As to the final charge, that the transactions of the parent Society are inferior in interest to some of its offspring; if true, it is a charge that rests on the whole body of the members; the Council provides oppor-

tunity, electrical batteries, optical lantern, and a handsome place of meeting; it provides for fortnightly gatherings of members interested in technical matters, and would gladly welcome more contributions from country members than it receives. There is, of course, a certain exigency in its demands as to originality—scores of questions that afford interest to minor meetings have already been discussed sufficiently in Pall Mall. In parting with "A Country Member" I am ready to wish, with him, much more success to the monthly meetings. This depends partly on the more or less of invention and discovery in photographic art and science that come with the years, and partly on such men as he determining to help as well as to criticise. Country members can send papers to the Hon. Secretary to be brought before the Society.

To turn to Mr. Pringle and comment on his letter is by no means a genial task, for, in my opinion, in his communication he overleaps the bounds of fair criticism, and indulges in imputations that are unwarranted and offensive. His usually clear intelligence becomes perturbed with passion when discussing the merits of the Photographic Society and the terrible misdeeds of its Council. We would cull a few gems from his letter to illustrate this statement. "The Photographic Society of Great Britain is an example to other Societies—of what to avoid." "Its blood is frozen, grievous wounds have broken out in its every part." "Its meetings are stagnation." "Chaos has reigned in the hanging department, Stygian darkness has enveloped the juries." The officers are "wire-pullers." "The Society tells off irresponsible men to deal judgment among the pictures." He distinctly insinuates that the examination by the jury as a body, of the pictures set aside by the hangers as of least merit was a dishonest farce, and considers the hanging "to have been a perfect burlesque." To all this screaming, spread-eagle, rhodomontade, the proper answer perchance is this: "Gentlemen, the members of the Photographic Society, behold on one side the accuser, bearing a shield emblazoned with the thistle, and this device—

'I am Sir Oracle,
And when I ope my mouth
Let no dog bark.'

And on the other side behold the accused, Jurors of the Exhibition:

James Glaisher, F.R.S.	
Valentine Blanchard.	Francis Cobb, F.R.A.S.
P. H. Emersou, B.A., M.B.	J. Traill Taylor.
H. P. Robinson.	W. Wainwright, jun.

And deliver judgment as to which of the parties are 'likely to be enveloped in Stygian darkness.'

One may also consider the fact that the Press notices of the Exhibition were favourable as to its arrangement and the merit of its contents; that to it were sent a larger number of pictures than could possibly be hung; that the public attendance was larger than ever before, and that the awards have certainly given general content. In the very nature of things (including disappointed exhibitors) there must always be a certain amount of grumbling, both at the hanging and the awards; but Mr. Pringle takes evidence from excited fancy only, to show that the jurors did other than carry out, with intelligence and strict impartiality, the delicate duties of their office. "Oh, that mine enemy would write a book!" quoth the suffering Job. Had he lived in our times a letter or two to THE BRITISH JOURNAL OF PHOTOGRAPHY might have consoled him. It is impossible to accept without reserve Mr. Pringle's valuation of his own opinions.

The points of his letter that have practical interest are two. First, to know if the permanent interest of the Society requires the Exhibition to be so managed that members have paramount claims on the space; and, secondly (a question of detail), Has the Hanging Committee conceded to the exhibitors of commercial houses interested in photography an unreasonable amount of space? To take the last question first, one may certainly answer it in the affirmative, if the excluded pictures could have filled the extra space with subjects of equal interest in art, quality, and in novelty. Further, if Mr. Pringle's contention recommends itself to the Society that pictures hung too low or too high are insulted and disgraced, and would be far better in the cellar, then it is clear that very severe restrictions on the space will be imperative. A definite limit to each exhibitor must be prescribed, and to hang only on what may be called good lines would reduce the total of frames hung this year to one-half. This drastic change would indeed result in wholesale rejections, and wailing and gnashing of teeth. I know that last year the Council had under consideration the expediency of limiting the space for individual exhibitors, and arranging a special tariff for commercial firms whose specialities might be deemed worthy of more extended space than would be open to individual members. The time was not considered ripe for settlement, since, not so long ago, the question was, How shall the space at command be all utilised?—not to puzzle over nearly 200 pictures for which room could not be found; now, however, the question has become ripe and presses for solution. At the same time, this other fact must be borne in mind—the popularisation of the camera through the gelatino-bromide process is so great that pictures by the score are sent in for judgment that possess no claim (out of the minds of the producers) to be hung at our Exhibition, and rejections must be numerous if the standard of excellence is to be maintained. Further, be it remembered, the Council is bound to consider the outside public in its conduct of the Exhibition. The members of the Society do not pay one

penny at present towards the Exhibition, nor ever will while it is successful; on the contrary, they have free space, free catalogue, and free admission for themselves and for their friends. The outlay on the Exhibition may be roughly rated as amounting to two hundred and fifty pounds, and it is to the public the Society looks for reimbursement of this sum. Consequently the responsible managers are right in considering this element, and probably the pictures of vast proportions that can bear ten feet elevation, and give variety and distinction to the gallery, have exemplified the progress of the art and the improvements in processes, with educational effect and with satisfaction to the visitors.

As far as my connection with the Council of the Society, considered in relation to personal interests in autotype, is concerned, I may be permitted to state that I have conscientiously endeavoured to be, if possible, more than neutral—that is to say, that while submitting abundant examples of permanent photographic achievement to the jury, I have done so to give choice, and have more than once intimated, as clearly as the delicacy of the subject permitted, that rejections would not hurt my feelings. I desired the interest of the Exhibition to be alone considered. That autotype is entitled to recognition, and has been of service, need not be argued; and if it be thought the Hanging Committee has committed any error of judgment, it is not of a character to justify Mr. Pringle's characteristic emphasis of inquiry, "Surely this is an outrage!"

To conclude my trespass on your courtesy, Gentlemen, there is now only to consider if members have a right to space (unless the work sent be flagrantly bad), if members' frames should be only second to non-members' frames, if the work of members, to a certain limit, should just be hung as well as possible; and if members are not to have these paramount advantages, will they be foolish enough to remain members?

The above statement of the question clearly shows Mr. Pringle's opinion to be that the Photographic Society should not throw the Exhibition open to all comers, but practically should dare to conduct in London an exhibition only to exalt the work of its own members. It is perfectly certain that outsiders would cease to contribute if their productions are to be relegated to the space where he himself says pictures are either insulted or disgraced, and such an attempt would earn the contempt of the public and speedily involve the Society in financial troubles.

In my humble opinion the only worthy course is to invite unreservedly home and foreign competition; the best and most representative work of each year to be chosen on its merits alone, until at least two-thirds of the available space has been allotted. By that time (the manifestly poor subjects having been set aside) a fresh survey could be made, when this condition would be just, namely, when any two pictures competing for the same space, their merits being considered equal, one the work of a member, the other not so, the member's claim should prevail. But the moment a jury ceases to prefer merit, the office is degraded, the exhibition injured, the progress of the art impeded, and the Society started on its decline.

The country members have always been faithful supporters of the Society, and as geographical conditions hinder their full participation in the general and technical meetings, they do not therefore complain. They probably feel that the parent Society has done, and is doing, good work; that its Council derives power only from the will of the members; that their interests are not neglected; and that some of Mr. Pringle's written spasms are but "sound and fury, signifying nothing."

W. S. BIRD.

THE AMATEUR QUESTION.

To the EDITORS.

GENTLEMEN,—Mr. J. H. T. Ellerbeck in your last issue, in order to get at the rank and file of the Liverpool Amateur Photographic Association, lays a statement of essentially private matters before the public at large.

It seems a necessity to reply, although the Council of our Association has studiously avoided bringing the matter before the public, feeling convinced that it was quite unnecessary to advertise the fact that Mr. Ellerbeck had taken up a line of action that made it a question whether the Council should resign and leave Mr. Ellerbeck in possession, or whether they should put the rules of the Association in force, and offer him the position of honorary member.

In order that the matter might be settled with the least possible detriment to Mr. Ellerbeck, I, as Secretary, published no report of our last two meetings, thinking that Mr. Ellerbeck's long connection with our Association and his large personal services entitled him to our utmost forbearance. Your issue of the 17th December contained a report of our special meeting, evidently inserted for the purpose of exciting public sympathy in this matter, a report which was unofficial, and in the opinion of many members of the Council most unfair.

The laws of our Association stipulate that its affairs shall be governed by a Council, consisting of actually nineteen members. As a matter of course the majority of the Council present at any meeting decides what is to be done, and as to the members of the Association, I am inclined to think they will be abundantly satisfied that the action of their Council is for the best interests of the members.

Mr. Ellerbeck is quite correct in saying that three years since he sent in his resignation. He did so and it was refused, as up to that time we only knew him as an amateur. He states that there was an understanding that he was to confine himself to landscape work. I do not

remember that there was any understanding, but I believe we all expected that he would remain amongst us as an amateur amongst amateurs and not turn suddenly into a professional against his old friends.

Mr. Ellerbeck in a sentence which defies analysis, states that he got no notice of—something or other, and that at a Council meeting which deliberated for two hours and a half, he was practically excluded from the Association. He not only got the notice from me which every other member got, but I wrote him specially twice begging him to be present. He could get no notice of anything besides. The two and a half hours kindly discussion, in which he might have shared and in which he was not the only topic, ended in our proposing to make him an honorary member in consideration of his long and valuable services.

No charges have been brought against Mr. Ellerbeck; your columns are proof of that. Mr. Ellerbeck, in a very well planned footnote, draws in the Birkenhead Society, but forgets to state that he assisted in the warmest manner in the formation of that Society, and that its admirably conceived rules owe some of their efficiency to his presence on the evening when they were formulated, and that his presence was a source of pleasure to every member until one memorable meeting when the same course of action on his part which has led to his separation from the Liverpool Association, led to the discontinuance of his attendance at the Birkenhead Society.

In conclusion, I beg to traverse most emphatically Mr. Ellerbeck's closing sentence. Our roll of members is larger than before, our meetings have been the cause of the expression of much pleasure on the part of numerous members during the past year, and if all the subscriptions had been handed in, our *satisfactory* balance would have been even more satisfactory. Mr. Ellerbeck has looked after the finances with the utmost ability to the close of the annual meeting, and as he has had the matter in his own hands until nearly a week after the date of his letter to you, the interests of the Association cannot possibly have suffered.—I am, yours, &c.,

H. NORWOOD ATKINS, late Hon. Secretary.

Rock Ferry, January 24, 1887.

THE MENACES OF AMATEURISM.

To the Editors.

GENTLEMEN,—I read and reread Mr. Robertson's letter with mournful interest. I can see amateurism, when outside well-to-do people, will become a menace to the established professional. I read the letter thus, that in Glasgow clerks—and we all know that clerks marry and dwindle on wretched stipends—become amateurs, get hold of the thing, build glass-houses, give up their clerkships, become third-rate professionals, tout for custom, run down prices, and damage if not ruin men who have incurred large expense in conducting business on established lines. One can fancy this sort of thing going on until a street has more studios than grog shops. Apparatus cheap and nasty is answerable for some of this. I see no remedy. I only feel what I would do if a professional in such a case. I would have the best lens I could buy—would introduce larger direct heads, would trust more to artistic feeling and less to my retoucher, would try my best to educate a *clientèle* into liking my special work and especially platino heads. I would, in fact, try and get into a zone which the clerk and his cheap set must leave in my possession.—I am, yours, &c.,

WILLIAM ADCOCK.

Melton Mowbray, January, 1887.

THE AMATEUR PHOTOGRAPHIC ASSOCIATION.

To the Editors.

GENTLEMEN,—I think most of your readers will agree with me that the subjoined letter is a most unwarrantable act on the part of the Council of the Amateur Photographic Association, and that things have come to a pretty pass when a member of a Club or an Association cannot express "dissatisfaction" with the management without being kicked out.

It was early in 1885 when I first expressed "dissatisfaction," but it was not until the beginning of 1886 that the matter was brought to the notice of the Council. On June 4th, 1886, I paid my subscription, due by the rules then in force on the 1st. On the 15th of the same month a circular was sent to me, stating that the date of payment of subscriptions had been altered from June 1st to January 1st; but it was not until January 20th, 1887, that the Council (?) found out they wanted to have nothing more to do with me. Of course I shall not let the matter rest here, and have written to the Hon. Secretary to say that I insist on my allotment negatives being received, and shall claim all the privileges to which a member whose subscription has been paid and accepted is entitled to.—I am, yours, &c.,

S. P. TALBOT NICHOLS, Lieut.-Colonel.

St. Hilary, Cowbridge, South Wales, January 24, 1887.

The following is the letter referred to.

AMATEUR PHOTOGRAPHIC ASSOCIATION,
12, Old Bond-street, London, W.,
January 20, 1887.

DEAR SIR,—I am directed to return your negatives, as the Council did not expect to receive any further contributions from you after the great dissatisfaction expressed by you respecting the Society.

I am, dear Sir,

Yours very respectfully,

(Signed) ARTHUR J. MELHUSH, Hon. Secretary.

DEMISE OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

To the Editors.

GENTLEMEN,—I am surprised! You would hardly think it possible after being hon. secretary of a photographic society for many years; but the fact remains—I am surprised. Yes, and at Mr. George Smith, too—a friend, a gentleman, for whom I have great respect; one of your contributors who seldom writes what is not worth reading, and who rarely speaks but people listen; in fact, if they *didn't*, his modest, quiet voice would be lost in the smothered hum and murmur usually going on at our photographic meetings.

Mr. Smith asks, in your last impression, "Was the lantern evening of the South London Photographic Society, on the 6th instant, a success?" Why, the lantern meetings of the Society have always been a success. If Mr. Smith were a stranger, I could understand his query; but he has been a visiting member for some years, and has often shown excellent slides that have materially helped the success.

Of course I can understand Mr. Smith not liking his Woodbury slides frizzled up by the electric light. I can understand that as the pioneer of that useful little instrument, the "Sciopticon," he prefers oil to anything else. I can understand familiarity with the small scale on which slides are shown at other societies having bred contempt for an eighteen-foot screen, and led him to regard a disc of reasonable size as a monstrosity, but it must be remembered that the late South London Society had advantages in this respect possessed by no other London society. If Mr. Smith prefers a benzoline lamp and a pocket-handkerchief, let him have them by all means, but he should not blame those who prefer (when they can get it) a sheet of ordinary and reasonable dimensions.

However, "Tis ill jesting with an aching heart." The South London Society (as such) has practically ceased to exist, and as many rumours are afloat about it, I shall be glad if you will kindly publish the following, a copy of which has been sent to each member:—

LONDON, January 12th, 1887.

"At a Special Committee Meeting, held on the 23rd ult., it was decided: That as the probable number of members for 1887 would not provide sufficient income to defray the necessary expenses, an effort be made to amalgamate the Society with the Photographic Club, to which so many of the Society's members already belong.

"A deputation accordingly waited upon the Committee of the Photographic Club, and at a meeting of that body, January 5th, the following resolution was passed:—

"That the deputation from the South London Photographic Society be authorised to announce to their Committee that the Committee of the Photographic Club agree to accept the members of their Society as members of the Club, at the subscription not exceeding that of the South London Photographic Society, during and for the year 1887, and that the South London archives be deposited in the Club Library with a view to securing the continuity of the South London Society, which has for a long period been intimately connected with the history of the Club, and with which it has been considered a mutually desirable amalgamation."

"The Annual Lantern Meeting of the South London Society was, as you are aware, held on Thursday last; and thus, I regret to say, terminated the independent existence of what for twenty-seven years had been considered one of the principal photographic societies in the world."

F. A. BRIDGE.

It may interest your readers to know that the scheme has met with the greatest approbation, and the desire to join the Photographic Club (by those not already members) has been almost unanimous.

Taking this opportunity of thanking the Editors of the journals for the courtesy shown to me officially in connection with the late Society, and also the many friends with whom it has brought me in contact for the ready help they have given me so willingly and so often,—I am, yours, &c.,

East Lodge, Dalston-lane, London.

THE WORK OF A PHOTOGRAPHIC SOCIETY.

To the Editors.

GENTLEMEN,—At the November meeting of the Newcastle Photographic Society I had occasion to complain of the difficulty I experienced in getting from members papers for discussion; I also stated that the Society had already covered to a great extent subjects of photographic interest. In sending a report of the meeting to the journals, I did not consider it necessary to give my own remarks *in extenso*; but as I find that the very short and condensed report has been made the subject of criticism in a paper by Mr. Forgan at a meeting of the Edinburgh Society, which I only noticed a week or so ago, I think some good may be done by an extended report in the form of a paper to the photographic journals of my remarks on that occasion.

I do not propose to criticise Mr. Forgan's remarks *seriatim*, when I say that our Association, since its institution in January, 1881, as will be seen from the published reports of its proceedings, has been favoured with papers on such subjects as *Lightning Photography*; *The Washing and Permanence of Silver Prints*; *Photo-micrography* (twice); *Carbon Printing*, with practical demonstrations (twice); *Dark-room Illumination*; *Platotype Printing*, with demonstrations (twice); *Transparency* (lantern) *Making* (twice); *The Oxyhydrogen Limelight*, *Ethoxo Light*, &c., by the Rev. T. F. Hardwich (four times); *Demonstrations of Printing with Ferro-Prussiate*, and similar papers; *Photo-lithography*; *Photography in*

Natural Colours; Chemistry of Development; Enlarging; The Recovery of Residues; Landscape Photography for Amateurs; The Permanence of Prints; The History and Results of Improvements in Photographic Lenses; Artists versus Photographs; The Daguerrotypic Process; Pinhole Photography; Retouching; The Advantages of Technical Education in Photography; Gray's Omega Paper, with demonstration; Art in Relation to Photography; Processes of Photography in Natural Colours, with demonstrations; Photo-spectrographic Analysis, &c.: add to this list incidental discussions on other matters, such as the *Photographing of Interiors; Orthochromatic Photography; Enlarging on Bromide Paper; Collodio-Bromide and Collodio-Chloride Work, &c.*; and I think my statement will be found fairly correct.

I gave a further list of subjects which would be suitable for discussion or papers, namely, The wet process, dry plate processes with the silver bath, gelatine and collodion emulsion processes, and the principles involved in each. The theory of development by the acid and alkaline methods. The theory of intensification. Printing in silver and other metals, toning and fixing. The collotype and powder processes. The calotype process. Woodburytype, stannotype, vitrified enamels. Special applications of photography to engraving; typography. Special applications of photography to astronomical and microscopical purposes, as well as for recording meteorological and other observations. I also referred to the questions given at the last examination in photography of the City and Guilds of London Institute, as affording further food for reflection and elaboration.

Our Society owns a small library, easily accessible to members, and I am quite certain that material for more than one paper or lecture is to be had from a perusal of any one of the volumes of the *JOURNAL* or *News* (alone) of the past twenty or so years.

I hope that the list of subjects given above may be useful to those of your readers who may be members of Photographic Associations; any additions thereto I, for one, should be thankful for.—I am, yours, &c.,
J. PIKE.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

- H. HATTON, Dewsbury.—*Portrait of R. E. Lockwood.*
F. HOARE, Cirencester.—*Portrait of Colonel F. W. C. Master, The Ven. Archdeacon Hayward, and Lord Apsley.*
M. J. E. COLE, Keighley.—*Portrait of Rev. W. E. Goodman.*
J. CLARE & SON, Abergavenny.—*Portrait of J. Bishop and F. H. Williams.*
S. C. VOSPER.—*Drawing entitled "Dance of Death," Plymouth Guildhall.*

MORE LIGHT.—Try Newman, Soho-square.

QUADD.—Make a complaint to the General Post Office.

M. JACOLETTE.—Mr. Briginshaw's address is 21, Albert-road, Walthamstow.

F. D.—This is purely a business matter, and you will find a remedy in the County Court.

AMATEUR.—We quite share your sentiments, and if in your place would act in a similar manner.

G. A. W.—Tinfoil of a very thin kind used to be, and we believe is now, supplied by Messrs. Stanton Brothers, Shoe-lane.

J. BARKER SMITH.—Plates of extreme sensitiveness are supplied by all makers of repute.—We do not understand your query about condensers.

ENQUIRER.—Take with you all the chemicals necessary to keep you going for some time, and arrange with a respectable firm here to supply your orders from abroad.

E. S. P.—Dry the prints between blotting-paper, or else squeeze them down on a sheet of ebonite, and allow them to dry before taking them off. This will prevent them from curling.

C. S. HYARON.—We do not see how the proposed picture can be an infringement of your copyright, unless it be copied from your work; and you do not say that this is the case.

LANTERN.—The Woodbury process of making lantern slides is precisely the same as making prints on paper by the Woodbury process, except that in place of paper the impression is taken on glass.

S. A. Z.—If you read the article again you will see it is distinctly stated that the plates will not keep long after preparation. Why not experiment yourself, with a view to overcoming the difficulty, instead of asking us to do it?

R. BLOGG.—If the gas bag is in the condition you describe the best plan to adopt will be to throw it aside and purchase a new one. It is often a risky transaction to buy a second-hand gas bag, and it clearly was so in the present instance.

LOLO.—A saturated solution is the one usually employed; sometimes a small quantity of chloride of ammonium is added to increase its solubility. Bichloride of mercury is much more soluble in a solution of chloride of ammonium than it is in plain water.

C. A. S.—The spots appear to be caused by something either in the mounts or the mountant. If this be the case, unmounted prints produced at the same time should not show similar spots. If they do, then they must be due to something in the manipulation.

A. R. FENTON.—Kauri gum is chiefly used for making varnishes, though, so far as we are aware, not for photographic purposes. It is, we believe, being somewhat extensively employed in some oil varnishes as a substitute for copal and amber, but we are told it is not so good for the purpose as the two resins named.

A. McDUGALL writes: "I have recently been shown some photographs of lightning; can they be genuine?"—They may be or they may not; without seeing them it is impossible to give an opinion. Genuine photographs have been taken of lightning, and we have seen several, but they all represent the discharge very differently to what it is depicted by painters.

J. H. WOLFF.—If you make the chloride of gold according to the instructions given in the article you can hardly fail, they are so clear and explicit. We cannot give the private addresses of our contributors. Each of the formule are good. The one attested by the introducer's name is the latest he himself employs; the other is preferred by some, but, as we have said before, both are good.

F. G. P. complains that he recently sent several negatives to a firm to have enlargements made from them, but the results returned were very unsatisfactory, and he can neither obtain any redress nor his negatives back.—From a perusal of the letter, and assuming that the statements made are correct, we are of opinion that there will be no difficulty in obtaining redress through a court of law.

G. CONWAY inquires what is "eosine and erythroline, which is being so much talked about just now in connection with orthochromatic photography."—In commerce there are several dozens of different eosines and many erythrolines. They are all colours obtained from the coal-tar products. The eosine supplied by the operative chemists is a tetrabromfluorescein, and the erythroline a tetraiodfluorescein.

R. C. W. asks how furniture is to be photographed so as to show all the details of the ornamental work. He says that the polish in his case always obliterates them, though he has seen some pictures of pianos in which every detail, even to the grain of the wood, is perfect.—The best plan is to photograph the things before they are polished. This, no doubt, was the plan adopted in the case of the pictures referred to.

G. THOMPSON.—1. To know the coated side of a plate in semi-darkness, hold it in such a way that some light is reflected to the eye and, by comparing one side with another, the difference will soon be appreciated.—2. Considering the small cost of the sulphite, we advise you to throw away the old and obtain a fresh supply.—3. If the plate box be quite clean and free of smell from the wood, plates may be kept in them for a long time without deterioration.

CORNISHMAN.—To make a solution of bitumen suitable for etching purp coarsely powder the bitumen and place it in a bottle, add benzole and we shake several times during the day; allow it to stand for two or three days and then decant the clear portion. This must afterwards be diluted to the strength required. As different samples of bitumen vary in solubility, no definite strength of solution can be given. It must be so dilute, however, that when it is dry on the plate it only forms a very attenuated film.

G. W. ATKINS.—Your example bears out what is mentioned in every manual, namely, that the first action of the bichloride of mercury is to darken and then to bleach the image. The bleaching action had commenced in the negative sent, and is plainly visible on the reverse side. The action being so slow in your case is owing to the solution being weak. We would advise you not to make any more copies of the subject you have experimented with, as it is illegal, notwithstanding that the size is so much less than the original.

W. T. F. M. INCALL writes to say he feels annoyed at finding anything published in the ALMANAC as his "last," this being in connection with the hydrokinone developer, because he has been making steps in advance in that direction. But if Mr. Ingall will turn once more to the ALMANAC, he will find that it is given as "the formula last published" by him, which there is no doubt it is. He says he has gone far beyond that. "I have now," he observes, "a single concentrated, colourless, developer which requires eight parts water to one part developer and, is good for glass and paper, especially Eastman's negative; but hydrokinone, which I still only use and believe in, has not attracted sufficient interest for me to write about it."

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, February 2, 1887, will be *The Photographic Uses of Artificial Light*.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday next a demonstration of the development of platinum printing will be given by Mr. F. M. Edwards. Members who had prints given them for the purpose of staining are requested to bring them to the meeting or send them to the Secretary.

AMERICAN PHOTOGRAPHIC EXHIBITION.—The first annual exhibition of the combined work of the Photographic Society of Philadelphia, the Boston Camera Club, and the Society of Amateur Photographers of New York, including, also, exhibits from prominent American and European amateurs and professionals, will be held under the auspices of the Society of Amateur Photographers of New York, March 26 to April 2, 1887, at the Orgies' Gallery, 845, Broadway, New York. The exhibition will be inaugurated on Saturday evening, March 26, at eight p.m., by a private view, open to members and their friends. All pictures must be sent, charges prepaid, to the Society of Amateur Photographers of New York, 122, West Thirty-sixth-street, New York City, endorsed "For Annual Exhibition," and delivered before nine p.m., Saturday evening, March 19, 1887.

RECEIVED:—A. W. Beer; G. Mason; E. Dunmore; J. H. Day; J. M. Turnbull; A. B.; G. R. Baker; and others.

* * * Through want of space we have been compelled to postpone "Editorial Table" and our "Department for Inexperienced Photographers;" also articles by G. W. Webster; A. Pumphrey; T. Stock; A. Pringle; R. Barnett; A. W. Scott.

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PHOTOGRAPHY AND PHOSPHORESCENT SUBSTANCES.

THE connection between photography and phosphorescent substances has always been more or less intimate, though of late years and for practical purposes the application has been almost confined to sensitometer purposes. Still, some years back, many and various hopes were entertained that sulphide of calcium would have played a more important part than it has done, both for ornamental as well as utilitarian purposes. One of the earliest suggested applications of the then comparatively new preparation, made by the late W. B. Woodbury, was of an ornamental or sensational rather than a really useful nature, and consisted in making a print by the well-known "dusting on" process, using sulphide of calcium for the purpose, which should, after due exposure to light, be visible in the dark. The idea was a happy one, and as a curious experiment was successful enough; but for reasons that will be noticed later on it never made much headway.

A modification of the same idea was, we believe, the inception of Mr. Warnerke; at any rate, some eight years ago we witnessed an exhibition of his plan in the Hall of the Society of Arts. It consisted in exposing a phosphorescent tablet for a brief period under a transparency to magnesium light, when an aluminous replica of the picture was left upon the plate. This again was of little practical value. Very shortly after this, however, an attempt, or rather two separate attempts, were made to render sulphide of calcium available in a practically useful manner. Early in 1880 Mr. Leon Warnerke introduced his new actinometer, a description of which appeared in these pages at the time. In this instrument a tablet of phosphorescent material was utilised as the light absorbed, and the force of the impression was judged by means of a revolving disc with openings of greater or less translucency, each bearing a number which represented the force of the light. Later still the same gentleman introduced the sensitometer which bears his name, and which was adopted by the Sensitometer Committee appointed for the purpose, as the nearest approach to a "standard" that could be obtained. In this also, as is well known, the phosphorescent tablet is employed, its light passing through a graduated screen before it reaches the surface to be tested.

About the same period, namely, in 1880, hopes arose that sulphide of calcium might be utilised in an entirely different manner in connection with photography. Mr. Warnerke and Captain Darwin almost simultaneously communicated to the Photographic Society of Great Britain their respective methods, by which it was anticipated that a luminous image, produced either in the camera or by exposure under a negative, might be

used for the production of several copies by merely placing the impressed tablet in contact with successive sensitive plates. Mr. Warnerke's plan consisted in exposing the tablet in the camera for an extremely brief period, while Captain Darwin's experiments had been directed towards the reproduction of negatives. Both were successful so far as the mere reproduction of the image was concerned, but the impression so produced was quite useless in each case from want of sharpness. The lack of definition was attributed, in Mr. Warnerke's case, to the fact of the exposures being made through glass, and in Captain Darwin's to the unevenness of the phosphorescent surface, which, it was supposed, prevented perfect contact with both negative and sensitive plate. It was imagined that, given a perfectly smooth and even tablet, in which the phosphorescent was not covered by any appreciable thickness of glass or other transparent medium, images of perfect sharpness would be reproducible; but subsequent experiments proved the expectation to be futile, for reasons that will be explained.

Some time after Warnerke and Darwin's experiments had been published, a number of specimens of reproductions made in the manner referred to were exhibited at one of the meetings of the Photographic Club. These had been produced under the most favourable circumstances for securing sharpness, but still exhibited the vague and hazy appearance of their predecessors. In their production a luminous tablet was used, made by pouring a mixture of melted paraffine wax and sulphide of calcium on to a sheet of plate glass to a sufficient thickness to form a pretty solid slab. This, when cold, is easily detached from the glass, when of course it presents a perfectly plane and highly polished surface, such indeed as to secure the most intimate contact possible with any other plane surface. Still, as has been said, even under these circumstances sharpness was not secured, and the explanation is not far to seek. It is not in the slightest degree a question of want of contact but simply the *spreading* of the luminous image in the phosphorescent material itself—the luminous image is, in fact, incapable of sharpness, and consequently of transmitting sharpness.

This is readily seen by examining the outline of a sharp object, left after exposure to light, upon such a perfectly smooth tablet; though at a moderate distance it may appear clear and sharp, it is only on closer scrutiny that it is seen that the impression is vignettted from light into darkness, that the effect of light has spread in the substance of the material in much the same manner as ink or other liquid spreads in bibulous paper, or the impressed image on a sensitive film in the production of halation. The effect may be clearly shown by examining, side by side, the luminous images formed first by exposure through an aperture cut in opaque paper or card, and, again, that pre-

sented to the eye when the same opaque mask is pressed in close contact with the excited phosphorescent surface. The first will present the want of sharpness alluded to, while the other will be perfectly clear and well defined at whatever distance examined.

Some claim to novelty appears to have been put forward recently in America in connection with this subject, as we learn that Mr. F. E. Ives, of Philadelphia, has been producing images by means of the exposure of the phosphorescent tablet in the camera and subsequent contact with a sensitive plate. The importance of this method, if it were practically available, can scarcely be overrated, since it would render "instantaneous" photography in almost any light a possibility. The briefest exposure only is necessary to set up phosphorescence to some degree, and even though the luminosity may be invisible, or nearly so, to the eye, a prolonged contact with a sensitive photographic plate will produce a developable image. But, unfortunately, the question of definition intervenes, and shatters the whole fabric.

Still, we have read the brief account of Mr. Ives's experiments, given in our number of the 7th ultimo, with considerable interest, and have since repeated several similar ones made some years ago; and to those who have never witnessed these phenomena we cannot recommend a more instructive evening's amusement and employment, the materials for which are ready to hand.

But passing to another portion of Mr. Ives's researches and his deductions therefrom, it will be interesting to hear of the confirmation of his present views on the subject of the action of the red rays upon phosphorescent materials. It is a generally accepted and undoubted fact that the luminosity set up by exposure to white light or to the rays of higher refrangibility is rapidly destroyed by the subsequent action of those of the lower end of the spectrum. But Mr. Ives has noted that in a feebly excited plate the action of the red end of the spectrum is to cause a "temporary exaltation," followed by a "rapid exhaustion" of the luminosity, which he attributes to the effect of the heat rays. We can only say that so far we have been unable to obtain any such effect. Heat certainly will produce such an effect upon sulphide of calcium, which, if thrown upon a hot plate instantly glows, and then rapidly loses its luminosity, and if the temperature be very high, will probably have its phosphorescent power practically destroyed. This, however, we have always considered to be a purely chemical action, quite independent of any optical consideration, and certainly a far higher temperature is required to produce the effect than would be produced by submitting the phosphorescent substance to the action of the less refrangible rays of the spectrum, or of light passing through red glass.

In the absence of any details in connection with the manner in which Mr. Ives's experiments giving the results were conducted, we can see but one possible explanation of the phenomenon. We are speaking now from a sceptical point of view, though, of course, we may be wrong and Mr. Ives right. It seems possible that the exaltation spoken of may be the effect of diffused light from other portions of the spectrum. Thus, supposing the whole spectrum, or any considerable portion of it, to be allowed to fall on the screen, the action set up by the blue rays would entirely mask any slight exaltation arising from extraneous causes, though the latter might prove sufficiently powerful to produce an appreciable change on those portions of the spectrum where the exciting influence is absent.

This would account for the "temporary exaltation," while the more powerful extinguishing action of the red rays would then commence to bring about the "rapid exhaustion." We merely put this forward as a hypothetical explanation of a matter we cannot at present understand; but it is, of course, possible that Mr. Ives has exercised sufficient care to entirely isolate the different portions of the phosphorescent screen, and so prevent any diffusion of the different rays.

We shall look with interest for further particulars with regard to Mr. Ives's future experiments in this and similar directions; but with regard to his claim to be the first to "discover that photographs of dark objects can be made in the camera by the action of heat," &c., we must point out that he is years too late. Captain Abney, seven or eight years ago, is said to have produced, not a *photograph*, that is impossible, but an impression in the camera of a kettle of boiling water in absolute darkness, and amongst other lecture experiments has demonstrated to large audiences the possibility of forming an image by means of a lens with a sheet of ebonite—which transmits the heat rays—intervening between object and plate.

PAPER AND PELLICULAR NEGATIVES.

SINCE the introduction of the gelatino-bromide process, great advances have been made in paper and film negatives. However, some of the advantages gained by the substitution of paper or other flexible materials for glass, are not altogether unaccompanied by certain disadvantages. One is, that however translucent the paper may be rendered, there is a prejudice, whether well founded or not, that under some conditions its grain must, to an extent, show in the finished print. This objection of course does not apply if the negative be on a perfectly homogeneous film. One weak point in connection with paper and pellicular negatives alike, has more than once been alluded to at the meetings of the South London Photographic Society by, amongst others, Mr. E. Dunmore, namely, that unless the film be protected with a varnish of some kind, there will be considerable risk of its becoming stained in printing, as when unvarnished glass negatives are printed from.

With the view to overcoming the objection raised to the granularity of the paper, the Eastman Company, some time back, introduced what they termed stripping films. The negative, in this case, is taken, developed, fixed, and washed, as a paper one, and is then transferred from the paper to a thin sheet of transparent gelatine. In this way, although the negative is really taken on paper, it, when finished, is on a homogeneous pellicle of gelatine and is free from all trace of granularity. Recently, the same firm has introduced an improved method of transferring the film, which bids fair to become very popular, as it avoids a difficulty sometimes met with under the old system of working, while, at the same time, a protective coating is secured on either side of the negative.

As the advantages of the modified method of transferring, and the points wherein it differs from the old, may be the better understood, we shall describe the latter first, and point out its shortcomings. It may be well to briefly mention how the negative paper itself is prepared. The paper is first coated with a solution of plain gelatine. This is merely to serve as a substratum and takes no part in the formation of the picture. After this coating is dry the paper is pressed and then coated with the gelatino-bromide emulsion, to which sufficient chrome alum has been added to render it, when dry, insoluble in hot water.

The old method of transferring the film is this: After the negative is developed, fixed, and washed, it is, while still wet, squeezed down upon a glass plate which has previously been coated with a thin solution of indiarubber and dried. The negative is then allowed to dry; and it is imperative that it becomes perfectly dry, otherwise the next operation—the stripping of the paper backing—will fail. When the whole is dry, the plate, with the adherent negative, is placed in hot water, which dissolves the soluble layer of gelatine next the paper and sets the latter free, leaving the insoluble gelatine bearing the image attached to the glass by the indiarubber. Next, a thin sheet of gelatine, which has been soaked in cold water until it is quite pliable, is squeezed on to the negative and allowed to dry. When dry the whole is stripped from the glass and any adhering indiarubber rubbed off with the finger. The negative is now finished.

By this method we obtain a film negative which is free from granularity, but it has no protection either back or front, and is therefore, open to the objection raised to paper or film negatives generally—and a varnish is not easy of application. Furthermore, in the development of the image, the pyrogallic acid exerts a tanning action upon the soluble gelatine substratum. Hence very hot water has to be used to effect the removal of the paper backing, and, in some instances, where the development has been prolonged, boiling water even has failed to dissolve the gelatine, and from this cause many negatives have been lost.

Here is the improved method of procedure by which this trouble is avoided and the time of the operation curtailed. A glass plate is rubbed over with French chalk, and then coated with plain collodion, such as that employed for enamelling prints, and immersed in water until all traces of the solvents are removed. The negative is now taken from the washing water, and squeezed on to the collodion. The plate is then placed between blotting-paper, under pressure, for a quarter of an hour or so. It is finally immersed in warm water, when the paper easily comes away, leaving the image firmly attached to the collodion. The reason why the paper can be so easily removed by the warm water, in this case, is that the insolubilising action of the pyro on the gelatine is next to *nil* until the latter has become dry. After the paper is removed a thin sheet of gelatine, softened in cold water, is squeezed on to the picture, and allowed to dry. Next, the gelatine is coated with collodion, and, when this is dry, the whole is stripped from the plate, the collodion applied to the glass forming part of the pellicular negative.

The advantage of this plan of transferring over the old is great. The first drying, which took many hours—sometimes a whole day—is dispensed with; added to this, the risk of the substratum becoming insoluble is avoided, this being a great gain. Furthermore, the finished negative is protected, both back and front, with a film of collodion.

If there are still any who look upon rain water as being "equal to distilled," their confidence would be shattered by the perusal of a very instructive table—published in the *Transactions of the Chemical Society*—giving detailed accounts of the examinations of rain water, conducted over a period of sixteen years at the Royal Agricultural College, Cirencester. From this table we find that the various samples of water, taken direct from the rain-gauge, showed the presence of chlorine to the extent of from two to twenty-six parts per million—a quantity which, calculated in connection with the amount of rainfall, would be equivalent to from 7 to 136 pounds of chloride of sodium per acre!

THE condition in which gold exists in the "alkaline toning bath" is a fruitful subject for speculation, for there are far many more theories propounded than facts collected to aid in forming a true opinion. The gold oxides have had less attention given to them than many other subjects of less importance to photographers, hence any addition to our knowledge is valuable. Recently Herr G. Kriess has been investigating the gold oxides, and his description of the properties of aurous oxide, Au_2O_3 , are very suggestive of that form assumed by gold in an acetate or other alkaline toning bath. He states that aurous oxide is dark violet when moist, greyish violet when dry; when freshly precipitated it dissolves in cold water, yielding an indigo coloured solution with a brownish fluorescence; it is insoluble in hot water. The solution has a characteristic absorption band when examined by the spectroscope. We do not remember to have observed any fluorescence in toning solutions, though this may be accounted for, possibly, by modifications caused by the presence of alkali. The most interesting point to discover would be whether the aurous oxide existed as such in the solution, or in combination with alkali as aurate, or finally, in both conditions.

WITH regard to the solubility of the double salts of gold—the form in which, practically, it is now only to be purchased from the photographic material dealers—an interesting account is given by Herr T. Rosenblatt. He finds the solubility is inversely proportional to the molecular weights of the salts. Taking as an example, he finds that, at a temperature of 16°C ., 53.2 parts are contained in 100 of solution, while at 60° there are 90 parts. The potassium salt at the lower temperature is only present in half the above proportion.

SHORTLY after the Eclipse Expedition of August, 1886, it was announced by Dr. Huggins that the results were unfavourable to his theory of photographing the corona of the sun in ordinary daylight, though others urged that it was premature to decide so soon upon the merits of the plan. Captain Darwin's preliminary account of his operations were recently communicated by Lord Rayleigh to the Royal Society, and with regard to this particular question he makes some reference to what has been termed by photographers "supplementary exposure." He says the instantaneous photographs of the corona, when developed, were complete blanks, proving that the exposure was too short. He points out, however, that this does not prove that the light of the corona was insufficient to cause an appreciable effect on the plate if combined with other light. "More light energy is necessary to start photographic action than is required to produce a visible difference of shade when once the action is started," he succinctly says upon this point.

WHILE stating that the results are adverse to the possibilities of obtaining photographs of the corona in sunlight, he considers it by no means proved that the method is impossible. "But at present I am inclined to consider that the result tends to show that a *practical* method of obtaining photographic records of the corona during sunlight is not likely to be obtained."

THE new glass of the Jena Glass Works, or rather, it should be termed, varieties of glasses, continue to hold the attention of scientific men interested in optical requirements, and Mr. Mayall, jun.'s, remarks at the last meeting of the Royal Microscopical Society met with great attention. It has already been stated that there is no difference between the chemical and visual foci of the new microscopic objectives, so that they can be used readily for photo-micrographic work; but then we must observe that also in the high powers of the ordinary construction this is usually the case: except in the lower powers it is frequently unnecessary to make any allowance.

MR. MAYALL further mentioned Dr. Schott's having expressed his conviction that several of the new kinds of glass will be found of great importance in the construction of photographic lenses. We are quite assured that our foremost English opticians are quite alive to any improvements that are to be found in the raw materials of their instruments—the optical glass; but it must be remembered that the high reputation enjoyed by our opticians

might be endangered if they too readily took up any new material without fully examining not only its optical, but its physical properties. Thus, to point to two instances only. There are some qualities of the new glasses that, owing to the action of the air upon them, can only be employed when cemented between two other pieces of glass. Then, again, when denser flints than had hitherto been made got introduced into the trade a number of years ago, it may be easily imagined the effects upon an optician's reputation if some of the samples on the market had been employed in photographic lens making, for their surfaces would not stand twelve months' action of the atmosphere.

AN idea thrown out by Mr. Glaisher in the course of his speech at the dinner on Monday evening is worthy of special attention. It is the desirableness of having premises either erected or purchased which will serve every purpose required by the Photographic Society of Great Britain, who now depend upon the Society of Artists in Water Colours. Having a large gallery of its own, the Society could then determine the best time for holding its exhibition without this being, as it now is, dependent upon the convenience of another body; it could have rooms in which to hold either small or large meetings; it would be free to employ the oxyhydrogen or any other light for projections, which it cannot now do; and, what is of great importance, under its roof might be gathered every Photographic Society and Club in London, who might be entitled to the use of rooms, hall, or laboratory, at a moderate stated rent.

WE would draw attention to one point referring to a matter that might be taken up by any photographer interested enough in the subject to give a little time to photographic astronomy. It is that in one second's exposure it is possible to get stars down to the sixth magnitude. It is, therefore, within the power of any photographer to produce star maps of any particular region by focussing his camera on the stars and giving one second's exposure. He might quite ignore the earth's motion, as it would not cause a blur that the eye could detect; indeed, assuming the one three-hundredth of an inch to be the limit of ordinary vision, such photographs, taken with a sixteen inch focus lens, would stand a small magnifying power, say, of two or three diameters, and still not appear blurred, while if the stars were allowed to travel so as to leave lines instead of points, stars of still lesser magnitude could be obtained in their maps.

ECHOES FROM THE SOCIETIES.

WHEN I made the remarks I did last week on the subject of the action of the red rays on the phosphorescent sulphide of calcium, I had not read the experiments of Mr. F. E. Ives, described at a meeting of the Franklin Institute. From these it would appear that those rays possess, first, an exciting effect upon a feebly luminous surface, which in turn is rapidly followed by total exhaustion of the luminosity. It is not stated how Mr. Ives's experiments were conducted, but I think the deduction he makes will be new to most of those who have had anything to do with phosphorescent substances.

Albumenised paper "dies hard." It has been threatened and threatened for many years, but seems to hold its own as firmly now, in company with numerous rivals, as it did when it practically filled the whole field. The London and Provincial Photographic Association had the matter under discussion recently, the behaviour of ready sensitised or "keeping" paper being chiefly in question. It was remarked incidentally by Mr. A. L. Henderson that there was nothing to equal newly sensitised paper, and with this statement I scarcely think any one will quarrel, though how few, except those who work on a large scale and constantly, now go to the trouble of floating their own paper. Even in many professional establishments the practice has been relinquished owing to the employment of the ready sensitised article enabling the proprietor to dispense with one, or perhaps two, extra hands, and in some cases to undertake his own printing. The question of comparative economy is, of course, his own, but it is due to his clients that the results he produces shall be the best attainable.

In the case of an amateur, the keeping paper is a boon inestimable.

How many of that class are able to seize the opportunity of a fine day to devote to printing? The sensitising and drying of even a small quantity of paper is a work of some time. What with getting out the necessaries, filtering the solution, floating, draining, and drying, consequently it has to be commenced early, and it is scarcely worth while to undertake it unless at least a considerable portion of the day can be devoted to printing. If the sensitising be performed overnight, it is ten chances to one that the luckless amateur finds the morning wet and dull, and totally unsuited for printing, and before he has a chance of using up his sensitised paper it has passed hopelessly into the sere and yellow. Indeed, in the hottest weather it is frequently impracticable to keep the paper for even so short a time as from overnight. Here the value of the commercial keeping paper is found. I say specially the *commercial*, for I have never yet met with a home-made article that at all approached it in quality. A spare half hour or hour before starting for business, or after returning on a summer evening, may be seized and utilised, and should the prints not be completed at the first attempt, no harm is done by putting the frames away until another opportunity arises. In such cases the question of a slight inferiority in quality may be waived in favour of the vastly greater convenience.

On the point of quality, however, it may be said that with some negatives the keeping paper will give actually better results, if it be in good condition, than newly sensitised. To wit, with these weak negatives a much more vigorous result is obtained, owing to the presence of the organic principle introduced, though conversely with a good negative of average density a softer and more harmonious result is obtained with freshly sensitised paper. Still, granting that one possible point in favour of the keeping article, there is no disputing the truth of Mr. Henderson's dictum, that the home-sensitised preparation is the better.

But the alleged superiority is chiefly in the direction of general behaviour, especially in facility of toning and economy of toning material, to say nothing of brilliancy and purity of the whites. On these grounds alone it is worth the while of any operator who can afford the time to sensitise his own paper, and in doing so he will find in the long run that the time devoted to sensitising will be economised in other ways, and his annual expenditure of gold materially reduced.

It was suggested at the same meeting that the cause of the difficulty frequently experienced in toning the keeping paper was probably due to the formation of a thin film of sulphide upon its surface. This may or may not be the case, but it appears to me more likely to arise from the gradual decomposition of the organic silver salt, usually citrate, contained in the albumen surface. The discolouration of freshly sensitised albumen paper is due to decomposition of the organic element, and this is also accompanied by difficulty of toning. With the keeping paper the tendency to yellowing of the albuminate of silver is held in check by the presence of free acid, but even without visible discolouration or with but the faintest metallic surface appearance the difficulty of toning will still supervene, and this result I attribute to the spontaneous decomposition of the unstable citrate of silver. It *may* be by sulphuration: but when properly stored, unless the sulphur be derived from the albumen itself it is not easy to see whence it comes. It is not difficult to conceive, however, how even *in vacuo* a gradual reduction of the silver salt may proceed, and few *quasi*-permanent substances are more prone to such change than the citrate and similar salts of silver.

By the way, before leaving the subject, I may say in reference to the paper alluded to by Mr. J. Traill Taylor as having been prepared by the late Mr. J. R. Johnson, probably twenty years ago, the existence of that paper in good and printable condition at the present day proves unmistakably the keeping power of citric acid. But Mr. Taylor confines himself to saying that it gives "a good print," he does not say whether that print was toned, and, if so, how it toned.

A particularly suggestive paper was read by Mr. H. H. O'Farrell before the Camera Club, on the subject of *Cameras and Field Apparatus*, the latter portion of the subject being however dismissed somewhat curtly. Mr. O'Farrell is very happy in the epigrammatic manner in which he expresses his idea of what a field camera should be. It should, he says, "be as light as is compatible with rigidity;

not as some makers seem inclined to read it, as rigid as is compatible with lightness." Would that "some makers" would take that to heart and act accordingly! I verily believe that no subject ever offered a wider opening for seathing sarcasm than the modern camera. Witness a joke I heard perpetrated a short time back. Amateur to friend who has just returned from two or three weeks' holiday, "Well, So-and-so, have you brought back many pictures?" "Only half a dozen or so." "How's that?" "Oh! it rained the first day." "Yes, but you had lots of fine weather afterwards." "Yes, but then I had no camera." Or again, look at the critic who, in discussing the good points of a particular camera, laid special stress upon the French polish which, he said, *kept it together*. This latter, I am assured, is a fact, and the statement, though probably exaggerated, undoubtedly points a moral.

I quite agree with Mr. O'Farrell when he says that both vertical and side swings are a necessity, whatever may be said to the contrary by manufacturers, whose particular patterns of instrument render it difficult, or impossible, to adapt one or the other. Again, with regard to the method of swinging from one extremity of the frame instead of from the centre, the almost universal plan nowadays, I wonder that photographers have not long ago insisted on its abolition. What can be more annoying than to have to spend several minutes altering and realtering focus and swing until at last the happy combination of positions is accidentally secured? When the swing takes place from the centre nothing is easier than to get the general focus in the middle of the plate, and then to alter the swing until the necessary straightening of the lines is secured or the requisite sharpness given to the foreground. With most forms of camera, the change could be made if insisted on. As things are at present, I know I frequently shun the use of the swing back, simply on account of the extra trouble it entails.

The lateral and vertical motion of the lens front is also a point that may be much improved in many of the modern cameras, and there is no earthly excuse for negligence in the matter. Any amount of traverse can be secured, almost from edge to edge of the plate, by the adoption of the principle I saw applied to a camera front in the last Exhibition, namely, the combination of a narrow solid wooden front and a bellows, or "gusset."

I do not quite follow his description of his proposed method of taking smaller pictures than the full size the camera is capable of, though undoubtedly Mr. O'Farrell is right in saying there is room for some such device. Many people would like to work two sizes in the field if it were not for the trouble and weight of two cameras. I cannot agree in his remarks either as to the reversible back adding unnecessarily to the weight and bulk of the camera, or that great extension of the body is unnecessary in field work. The first I consider one of the most valuable improvements made to the field camera in modern times, while if cameras and lenses of longer focus were more generally used it would not be to the detriment of much of the landscape work turned out.

On the whole, Mr. O'Farrell's paper is a suggestive one, and is a valuable addition to the literature of the subject which makers as well as users would do well to study.

MONITOR.

THREE PRINTING PROCESSES AND THE SULPHURING OF PLATINUM PRINTS.

For some little time I have held the opinion that the acrimonious discussion, the sort of "triangular duel," that has for a considerable period been filling valuable space in the columns of this JOURNAL was much to be deplored. I am, however, beginning to waver in this view, for it has enabled the very worst and the very best to be said by friends and opponents of the respective processes, thus giving the unbiassed an excellent opportunity of forming a calm judgment. Personally, I think I may claim to be quite without bias, being, as I am, on friendly relations with the representatives of each of the older processes, having worked in autotype when the practical workers might almost be counted on the fingers of one hand, and having printed in platinotype for many years. I have worked, and continue to work, the two processes side by side, finding them in no sense rivals, each possessing certain advantages over the other, and each capable of first-class results.

When the very highest class of work is to be done platinotype cannot be excelled. I have tried it both in portraiture and in landscape, for single pictures and for book illustrations, for plain and for coloured pictures. I look upon it as the process to be selected—if those colour or colours which only can be produced by it be considered suitable for the desired end—for the highest class of work. But it is not, in my opinion, to be selected for that class of work where negatives of but indifferent character are likely to be at all frequent.

Autotype also is capable of very beautiful results. It has not the perfect purity in the whites that the former can give, but it is far more elastic in its adaptabilities, and is such a first-rate all-round process that I am often surprised there are not a larger number of photographers practising it on their own premises than seems to be the case. Its difficulties are easily surmounted by the exercise of a little care and thought. Besides, what is any process worth to a photographer if it can be learnt in a lesson, and there is then no further experience to be gained? I am sorry that the method of double transfer from grained zinc seems to be almost a thing of the past, for the effect obtained by the matt surface was singularly refined, pleasing, and artistic.

With regard to the many emulsion processes upon paper, it would be premature in me to pass an opinion as to their artistic capabilities in everyday work, and I therefore confine myself to subjects that I have given much attention to, this method being too young for me to be able to say much as to its possibilities. That it has great power of artistic expression is shown by the results already before the public.

As to the reliability of the two processes I am familiar with, it appears to me that photographers have facts enough before them to enable them to form their own conclusions. In each we have a paper basis, but there the simile ends; for in one the image lies within the texture of the paper, and is, let us say, alleged, to be composed of metallic platinum; in the other it lies on the paper in a film of gelatine, and is composed of carbon in the main, with some trace of a chromium salt, and a quantity of pigment, supposedly an alizarine compound.

I may say I feel quite content to believe that the image in a platinotype picture is platinum, and as a chemist I believe that it—the image—would not be altered after the lapse of a hundred or two years. Similarly as to autotype, it is my strong belief that the carbon *per se* will not alter in that time, though the companion pigment might—the latter is an open question—and I also am quite content with the chances of the gelatine remaining unaltered for a few centuries; and although it certainly might leave the paper I consider such an occurrence unlikely. There then remains the paper. It is, by the way, rather amusing to see how novel a discovery it is by many considered that paper should become discoloured in the light, for the fact has been known to experts for years, and, indeed, a reference to any well-kept library tells the same story to any one who cares to inquire. The slight amount of chromium left in an autotype print is not likely to be of the slightest injury, and we have only to consider the possibilities with platinotype, which I will deal with fully on account of a recent article upon its results.

Mr. Pringle has done the process a good turn, and also photographers generally, by calling attention to the fact that the whites of a platinum print, done by an assumedly careful worker, may be yellowed by the application of sulphuretted hydrogen. I have seen the experimental slips he has earned the thanks of the profession by bringing forward, and some of them are a darker yellow than I should have thought likely. The image itself to all appearance is not altered. The effect is important enough to render it worth while to spend some time in ascertaining its cause, and with this object in view I have made a series of experiments which I proceed to detail.

The first point was to repeat Mr. Pringle's experiments, and this I did by tearing a number of slips from waste platinotype vignettes, where I should have a sufficient area of white surface for comparison. Preferring sulphide of ammonium solution to sulphuretted hydrogen, I immersed the slips in a strong solution of the former and left them exposed to its action for thirty-six hours. Result, a perceptible change of colour, not the same depth in each slip, and partaking more of a grey than a yellow tone. I cannot quite understand the cause

of the latter colour in some of Mr. Pringle's slips. I am not disinclined to imagine that he left them in the light and that partial decomposition of the gas had occurred with precipitation of sulphur. This, however, does not affect the deductions to be drawn.

The slips were all carefully dried and compared with the corresponding untouched halves, for thus only could the proper tone of the colouration be perceived. It was in no case so deep as to have seriously interfered with the value of a picture for hanging, but certainly it would be better away. Knowing the large quantity of iron that there is at one time upon the surface of the paper, it was not difficult to imagine that a trace of it was left. The possibility of this danger appears to have been foreseen by the Company who, in their latest instructions, give (I speak from memory) a further acid bath beyond what they first recommended. I accordingly proceeded to test the stain for iron. Boiling oxalic acid solution instantly removed most of the discolouration; but upon drying there was still a faint trace of grey, very possibly the last trace of platinum salt not washed out and reduced to metal.

The result was so suggestive of iron that I did not proceed further with this stage of the experiments, but at once set to work on the check slips. These, again, I tore up with my fingers (to avoid the possibility of introducing iron from the friction of the blades of the scissors), and digested for three or four hours at a temperature of 150° Fahr. in a strong, "pure" hydrochloric acid solution, and finished by boiling the whole for half an hour. To check the experiment I tested the acid itself for iron, as it was simply commercially "pure." It gave only a pale pink with sulphocyanide of potassium, and a scarcely perceptible alteration with ferrocyanide of potassium.

Applying these same tests to the acid in which the paper had been boiled the presence of iron was unmistakable, the sulphocyanide gave a deep rose when the acid was diluted with five times its bulk of water, and the ferrocyanide gave a good blue when an equal bulk of water had been added. Here was plain proof of the presence of iron in quantity, enough to cause all the observed discolouration by sulphur as seen in the prints submitted to the original test. How did it get there? Was it in the paper to start with, or was it only introduced in the preparation of the paper for printing in platinotype? It is quite possible that it may have been introduced in each stage, for it is at all times difficult to obtain paper entirely free from traces of iron, and it can easily be seen how the last trace of the purposely introduced iron salt might not be removed in the washing operations. It is possible also that the iron might form a compound with the organic matter in the paper, or perhaps the paper itself, and, as this might be looked upon as a substance somewhat analogous to a lake, it is quite possible that the substitution of oxalate of ammonia for the potash salt might be advantageous when one remembers the remarkable solvent powers of the former upon aluminous lakes.

As I have said, any observations upon emulsion prints would not be those of an old practitioner; but I may at the end of my remarks put the question as it presents itself to me. Here we have paper again as a basis, subject to the same influences as in the other two cases; a gelatine film, as in autotype, to contain the image—an image composed largely of reduced silver—and, finally, the possibility of the introduction of deleterious matter in the film. The latter is a difficulty not necessarily insurmountable, but one which photographers through unfortunate albumenised print experiences rather fight shy of. Then there is the silver image; and with regard to that there is first a question could the atmosphere obtain access to it through the gelatine that imprisons it? and next, could it do any harm if it arrived there? Here every one is able to form his own opinion, and it would be futile of me to direct it. I wish the heartiest success to the three rival processes; I hope that what I have written will tend to encourage the practice of each and all.

G. WATMOUGH WEBSTER, F.C.S.

ACCESSORIES OF THE LANTERN.

CHAPTER II.—GAS BAGS (continued).

Testing the Gases.—If a bag is suspected of containing a mixture of oxygen and coal gas, a light should on no account be applied to the open tap of the bag to ascertain if such is the case. Such a plan would no doubt be very effective, since, if the gas were to explode and burst the bag, it would be proof positive that there was such a

mixture. As we cannot afford to risk the bag in this way, we will adopt a safer method as follows:—A little of the suspected gas is squeezed out of the bag into an eight or twelve-ounce wide-mouthed vessel, such as an empty lime bottle. The bottle is easily filled with the gas by holding it over the open stopcock, so that the gas may blow for a few seconds into the bottle, which is then corked to prevent its aerial contents escaping by diffusion into the atmosphere. The bottle, having been removed from the vicinity of the bag, is uncorked and a lighted match is dropped in. If the match burns very brightly the bottle contains oxygen; if a lambent flame issues from the mouth for a few seconds it is due to coal gas; but if a "pop" or miniature explosion takes place the bag should be immediately taken into the open air and emptied of the gas it contains, which is an explosive compound of oxygen and coal gas.

This plan should also be adopted when a bag which is not suspected of containing a mixture of gases is tested to ascertain the nature of its contents. The usual way of doing this is to apply a light to the tap of the bag, which is partly opened so as to allow some of the gas to escape. This latter method is tolerably safe if the tap is held in a horizontal position and the gas is quite pure; but, as mistakes sometimes occur in the filling of bags, an explosion might result from this way of testing, hence the bottle method is to be preferred.

Capacity of Gas Bags.—The capacity of a bag is usually calculated by multiplying together the three dimensions—length, breadth, and depth; this result being halved gives the capacity of the bag as a wedge with flat sides. But as the sides do not remain flat, but bulge out considerably under pressure, the capacity is thereby increased—hence it is customary to add one-fourth to the wedge volume, in order to ascertain the amount of gas the bag will contain. Thus, assuming that a bag is three feet long, two feet wide, and one foot in height of wedge, we find its capacity as a wedge with flat sides to be three cubic feet, and adding the amount due to the bulging we get three and three-quarter cubic feet as the amount of gas that the bag will hold.

A bag containing four or five cubic feet is sufficient to supply a safety blow-through jet of 200 candle-power with gas during a two hours' exhibition. Larger bags are used for mixed gas jets, as these require a higher gas pressure. A jet with a moderate sized aperture in the nozzle burner, giving a light equal to 300 or 400 candles, will need bags holding six or seven cubic feet each; while the more powerful jets with large apertures, giving a light of from 500 to 700 candle-power, should have a pair of bags capable of containing each at least ten cubic feet of gas.

It is, of course, much better to have an excess of gas than too little of it; there should be a little surplus gas left after an exhibition, so as not to run the risk of being short in the case of a slight accidental leakage. This reserve may be regarded as the premium by which the success of the exhibition is insured.

Repairing Leaky Gas Bags.—When a bag is found to be leaky, it is well to decide what the cause is—it may be due to simple corrosion of the indiarubber by the gases or it may be caused by accident. In the case of general corrosion it will be scarcely worth while repairing the bag, as no real good would be effected unless the bag was completely recovered all over, which would cost nearly as much as a new bag. The leak may occur only in one place at first, and if a patch is put on, the bag may be used a little longer; but fresh leaks will occur so fast and will give so much trouble that it is poor economy to delay purchasing a new bag. A leak of corrosion is not confined to a small area, for the gas will slowly ooze out over, perhaps, a square foot of surface. It is often a difficult matter to find out the locality of such a leak, as the escaping gas diffuses so quickly into the atmosphere that the ordinary tests may fail to detect it; in such a case the only way is to put the bag, when full of gas, under a heavy pressure, so as to increase the quantity of gas issuing from the defective place.

Accidental leaks offer a far greater inducement to be repaired, as, if properly done, the bag is practically as good as new. Leaks of this class may occur in bags both new and old. They are caused by many things, such as the bursting of bags by over pressure while between the pressure boards, bursting by being overcharged with gas from the retort, giving way of a seam, rents produced in travelling, frayed portions which have been caused by dragging the bag over a rough surface, malicious pricks with knives, pins, and nails, and, in fact, every kind of damage affecting only a small part of the bag. I once had a gas bag run over by a railway train. Such an accident is not an everyday occurrence; it was caused by the upsetting of a porter's truck containing the lantern apparatus while crossing the rails about midnight, so as to reach the far platform of

the station at Wakefield. A train was advancing fast to the spot, and there was just time to jerk the lantern box and pressure boards out of the way—the rest had to take their chance; but the only damage done was to the gas bag, which had a piece a foot in diameter cut neatly out of it. This was an instance of an accidental leakage well worth repairing. A large patch was cemented on and the bag did as good service afterwards as though no such incident had occurred.

The testing and repairing of a gas bag is quite within the power of the average lanternist to accomplish; it is a simple matter, and it is by no means a necessity to send the bag to the maker or to an india-rubber shop to be doctored. Probably the first intimation that something is wrong with the bag will be the fact of the gas running short during some important exhibition, which causes the last few slides to follow one another with unwonted celerity, or else they are not shown at all. If the rubber pipes and the connections are found to be perfect, the fault must lie with the gas bag. This is easily ascertained by filling the bag with air or coal gas, and leaving it all night under pressure. If it is empty, or nearly so, in the morning, it is evident there is a leak somewhere, and our next business is to find out where it is.

If the bag has contained oxygen it should be thoroughly freed from that gas, first by rolling the bag up as tightly as possible to expel the gas, then by partly refilling the bag with air and again emptying, and, lastly, by filling it one-third full of coal gas and emptying afresh in the open air. It will then be safe to fill it as full as possible with coal gas and to apply the tests.

If the leakage is a large one it can easily be detected by the slight rushing sound and odour of the gas when under pressure, but if there is only a small leak, or perhaps several small leaks, this method fails. The test is then to carefully pass a small flame, such as that of a candle, all over the surface of the bag when under pressure; the leaks will be indicated by a small blue flame appearing where the gas escapes, which should of course be immediately extinguished with the aid of a damp cloth. The position of a leak when ascertained should be marked with chalk; it will often be found that the gas oozes out in more places than one—each of these should be also marked in turn.

I have mentioned a lighted candle as the test, but it is rather a dirty plan, as it drops grease on to the cloth; it is much better to attach one end of a long rubber tube to a gasfitting connected with the main and to put a brass pipe into the other end. Sufficient gas should be turned on to give a small blue flame an inch high at the orifice of this brass pipe, which can then be passed over the surface of the bag as handily as the caudle. It is best to conduct this operation in a dull light, as a minute leak would yield so small a flame as to be invisible in bright daylight.

If the leaks are small it may be necessary to apply great pressure to render them evident. This may be accomplished by putting about a cubic foot of gas from the main into a second gas bag, the two bags are then connected by a rubber tube, and the second bag is rolled up into a small compass and a weight put on it, so as to force the extra foot of gas into the bag to be tested, which will become thereby drum tight; by thus filling a bag with as much gas as can be got into it, and subsequently applying pressure, even the tiniest leaks may be detected.

Having duly marked with chalk all defective places, the bag may then be emptied and the patches cemented on. The patches are cut out of india-rubber cloth, which should be "double sheet," consisting of a layer of rubber between two cloths. The thin single sheet mackintosh is not sufficiently durable. If black waterproof cannot be had the white will answer, as it can be darkened afterwards by being brushed over with a black pigment.

The patches should not be less than six inches square, and are best cut cushion shape. A tin of india-rubber solution being purchased, one side of the patch is smeared evenly over with the cement, and allowed a couple of hours to dry; the part of the gas bag where the patch is wanted is treated in the same way. A second thin coating of cement may then be applied to both, and also allowed to dry. The patch is then put on the bag, so that the two dry cemented surfaces come together; they will adhere very firmly, and after being well beaten with a wooden mallet, to ensure thorough contact, the leak will be permanently and completely stopped.

ALBERT WM. SCOTT.

METHODS OF RETOUCHING.

I.

I THINK it may fairly be considered a disputed point as to the proper order of acquiring a thorough knowledge of, and proficiency in, the art of retouching. Some hold to the idea that *method* is the primary necessity, others that a thorough knowledge of all the

minute requirements of a negative, and how they should be treated, should be the first anxiety of an intending retoucher. Personally, I am somewhat disposed to favour the latter opinion. I have always found that pupils, when once they acquire a certain proficiency in any *method* of working, cease to direct further attention to the study of the face. This has a very baneful effect in the end. The student falling into this habit may secure a very pretty and effective method, but the pictures he will turn out will be thoroughly devoid of that animation and expression so necessary to a true and life-like portrait. On the contrary, when he has given his attention fully to the study of the face, and thoroughly mastered all the effects of light and shade upon the muscles of same, he is in a safe position to start upon acquiring a method suitable to himself for the carrying out of the improvements that may be necessary on any negative which he may undertake to retouch.

As before laid down, it is impossible to know too much about the anatomy of the face, and I honestly advise every one desiring to become competent retouchers, to spare no pains in acquiring a thorough knowledge of it, before seeking for a method or style of working. By this means, too, there will be no hesitation while wavering between one style and another as to what you will do. You work ahead, and working suddenly realise that you have acquired a method of your own for carrying out the necessary treatment of a defective negative. Practice, then, will bring you not only proficiency but also rapidity of execution. I do not lay this down as a hard-and-fast rule, but if given a little consideration I feel confident it will have at least sufficient weight to balance what may be considered liberally a matter of opinion.

As may be gleaned from these remarks, I have no special method which I would put forward as the only and best one to be adopted by a beginner. One retoucher may have a very widely different style from another, and yet the results be so similar that one could scarcely say which was which. Of course, in such cases the two retouchers must have the same sentiments regarding the treatment of the muscles of the face; if they have not (even if their style be *identical* instead of broadly *different*), the most uncultured observer can discern the difference. This again proves the importance of the knowledge of the anatomy of the face, if such were still wanting. It is this same knowledge which marks the difference between the really competent and artistic retoucher and his less instructed comrade.

The first and most necessary implement used in retouching a negative, as all no doubt know, is the pencil. The method of using same will therefore claim our primary attention. Having placed the negative on the retouching desk, and seated ourselves in such a position as to secure ease and comfort, we will begin our work. I will not hold exclusively to my own method, but enumerate several of the most approved systems from which a selection may be made according to the taste or *feeling* of the student. In times gone by, the negatives, as a rule, came to the retoucher ready for working upon. This was in the old wet-plate time. All this, however, has been revolutionised since the almost universal adoption of the dry plate. Now we are obliged to put a medium upon each negative before we can begin our work, as there is absolutely no *tooth* whatever to which the plumbago will adhere. I may have something to say later about the many kinds of medium, but for the present will be content with saying that a medium must be used. This done, we begin by obliterating the apparent blemishes or transparent spots visible on the negative. Some retouchers do this by dotting the negative on these places, and so leaving sufficient plumbago on the film as is necessary to increase its density to that of the surrounding parts. Others adopt a touch something like a comma, others still hold that a continuous system of circles run over the face will produce the desired result. There are some, however (including the most capable retouchers of the day), who adopt lines for their leading treatment. This latter I also hold to be the best, as by it any desired effect can be produced. I do not mean to convey that the lines are straight or rigid; on the contrary, they may be, and generally should be, slightly curved and graceful. They should also follow the lines and muscular drawing of the face, or else we may fail to secure a harmonious result. Let us therefore adopt this latter style in treating the negative before us. Personally (and I follow in the footsteps of a good many better men) I recommend the placing of the negative slightly upon its side, so that we can with comparative freedom make a downward stroke of the pencil that will make a line across the forehead. We must now fill in all irregular and transparent spots and lines (of course, without interfering with the essential markings of the face as before laid down), imparting to these spots and lines the same degree of density as the surrounding portions of the forehead. Of course, if there

should be very marked wrinkles on the forehead they must not be totally taken away, although they may with advantage be very considerably modified. It is not at all necessary or even advisable to completely fill in the various spots and other irregularities we find on a negative, one or two lines, according to size of defect, drawn through them being sufficient. By so doing we secure a double advantage; the slight shade or half tone thus left in will lend a softness, and also, when finished, in part a stippled effect to the picture. This result would be quite impossible if we were to completely block out the spots unless we afterwards made a point of stippling the negative all over. This would naturally entail the loss of much valuable time, and would be likely to impart an over-laboured appearance, without securing the soft and flesh-like stipple so easily attained when the touches are made as above directed. In carrying our work over a face our lines must always take the same direction as indicated by the lines of the skin and position of the muscles. Of course, when these lines run perpendicularly, owing to the contraction of the muscles, we must also modify our touches so as to be in harmony with such conditions. These effects are principally found upon the forehead, and sometimes on the upper lip. Sometimes through the contraction of the muscles hard lines are produced upon the temples, and must not be removed in every face; they may be leading characteristic features without which the likeness would be seriously impaired. If careless, we run the risk of producing one tint over the entire forehead, which would be ruinous, therefore we must be sure to leave indications, however slight, of all these markings, and when the broader effects of light are put in the retention of these indications of form will impart a pleasing and life-like character to our work, which, by other treatment, might be easily lost.

We can now turn the negative somewhat more upright in order, following the direction of the muscle of the orbit, to soften the lines (should there be any) formed around and about the plane of the temples. We can now place the negative nearly upright while we work upon the frontal depression, and also the nose. For the softening and modelling of the furrows under the eyes, certain portions of the nose, and the upper lip, the negative may be turned back so as to facilitate the firm stroke of the pencil, the direction of the stroke as laid down being always strictly adhered to.

The treatment of the labial furrow should be very decided, sufficient density, if possible, being secured at the first application of the pencil, and executed by one long, firm sweep, covering its entire length. Wherever lines running in different directions may cross or meet each other, and necessarily leaving minute defects, it is quite allowable to fill up same with a dot or stipple made with the point of the pencil. We can so proceed, turning the negative constantly as the lines take a different direction, until it assumes an even and delicate appearance all over. The spots being filled up or cut in the first instance, all after strokes used in modelling, &c., should be kept open and equi-distant, or else the work will not be so uniform. A stroke of the pencil must never be made across a line; always turn the negative so that at a firm, downward stroke the marking may be satisfactorily filled in. In retouching the neck long sweeping curves should be employed, the negative being almost on its side. In cases where the subjects are very badly freckled, of course there will be necessity for a larger amount of work done with the point of the pencil than is above laid down. But naturally every would-be retoucher must use his judgment in such matters, as it would be perfectly impossible to lay down hard-and-fast rules that would govern all the conditions under which we might find every negative. I think with these directions well carried out, we can, as far as *this* method is concerned, lay down the pencil and take up the brush.

It is very seldom that a negative does not require *spotting*, i.e., removing any transparent spots that may be in the film, by whatever cause produced. This is done by filling the spot with a colour (water) made to match the film, or a little neutral tint or violet applied with a finely-pointed sable brush. Should a negative have a great number of very fine holes, like pinholes, the result of some defect in the making of the plate most likely, only spot those in the face, as these in the background and drapery will not be very observable to the naked eye. To attempt to spot these out would be absolute madness, as no matter how fine we might try to spot them we could not do so without making a quantity of white spots visible in the print, and thus entailing more work to afterwards set them right again.

Should the negative be poor in quality and lack brilliancy, and so require helping in the lights, we must matt varnish it and put same in, where defective, with a fine leather or paper stump charged with plumbago. A negative may thus be made serviceable which

otherwise would be useless. I hope these directions will prove sufficient as far as *this* method is concerned, we can then study some of the other systems as practised abroad.

REDMOND BARRETT.

I trust the foregoing on "Methods of Retouching" may not be considered as the result of the remarks made by "Free Lance" in a former number of the JOURNAL. I always intended to give them, and their absence was caused by circumstances over which I had no control, although, needless to say, my articles would be incomplete without them. I hope, however, now they are here, that they will (when finished) give that full measure of information which is so necessary to a mastery of the art.—R. B.

PHOTOGRAPHIC LENSES.

[A Communication to the Society of Arts.]

WHILE there are few lenses which cannot in some way or other be made to conduce to the formation of a photographic image, yet does the photographic objective differ *per se* from all others in certain characteristics.

Arriving at a definition of what forms a photographic lens by contrasting it with the object glass of a telescope, we find that whereas the function of the latter is to produce an image of objects which are transmitted axially, or in near approximation to the axis, the former must not only do this but more, for it has to take account of rays transmitted also at considerable obliquity to the axis, and after such transmission has to project these oblique rays to distances proportionately greater than axial ones ere they come to a focus, in order to supply the condition of a flat field. Hence the greater the obliquity of the pencils the more elongated must be the converging beam in order that this indispensable condition be fulfilled.

Again, whereas in visual lenses (by which term I here designate such as are employed in the formation of a merely visual image—as the telescope) it suffices to bring to a focus as many of the luminous or visual rays as possible, or as the irrationality of the spectrum and the glass at command will permit, the photographic lens has to take cognisance not only of these, but of those which, possessing inferior luminousness, have more energetic action. In the correction of a photographic objective for achromatism it is therefore desirable that the yellow and violet rays be united, in order that when a sharp image is seen at the focus on the camera screen, an equally sharp image will be produced on a sensitive plate placed on the same plane, technically known as working to focus, or having the visual and chemical foci coincident. To effect this in an astronomical telescope intended for photography, it is necessary that either the flint and crown elements of the objective shall be separated to some considerable extent, by which the definition both visually and photographically becomes lowered, or to have a supplementary crown glass so adjusted as to secure this condition of coincidence.

It not unfrequently happens that in a photographic lens corrected perfectly to work to focus in the centre of the field, the photographic definition towards the margin will be found to be of a higher class than the visual image. From this we may deduce the fact that a formula by which direct or axial rays are achromatised, does not include the case of oblique rays otherwise than as an approximation.

At this stage it may be well to say that I am to speak of lenses which are formed of optical glass as we find it in commerce at the present time, and shall avoid the realms of conjecture as to the possibilities which may arise from the practical introduction of new kinds of glass which at present are still in the tentative or rudimentary stage. This topic belongs as yet to the optics of the future.

When photography was young, various devices to work with a large aperture, and at the same time to secure sharp definition, were had recourse to. It had been early found that single lenses would not answer, because of their actinic plane of representation being situated somewhat nearer to the lens than that of the visual focus; accordingly the single lens of the camera obscura was supplanted by the achromatic lens of the telescope, the surface of maximum convexity being placed to the outside. Owing to the circumscribed area of definition, the lens was afterwards reversed as regards position and a diaphragm placed in front. The value of Wollaston's meniscus lens was in time duly recognised as a means of securing an extended field; and a lens which I find engraved in a manual by Daguerre, published in 1839, is practically that which is being manufactured in the present year, 1887, subject in some cases to modifications, in others to none. At this juncture, and in the same year, Chevalier, a Paris optician, improved the illumination by combining two achromatic lenses.

But it was reserved for the genius of Professor Petzval, of Vienna, to make the grand discovery of the portrait lens. A year after Daguerre's discovery, the late Voigtländer, when calling upon Pro-

fessor Von Ettingshausen, was asked by that gentleman whether he could determine the refracting and dispersing power of different descriptions of crown and flint glass, because Professor Petzval, who was at that time filling the mathematical chair in the University of Vienna, had made the calculation of a photographic lens which could not be executed in consequence of the qualities of the glass to be employed not being then in existence. Voigtländer, intimating his ability to do this, was asked to call immediately on Petzval, and was given a letter of introduction to that gentleman, accompanied by the observation that by furnishing the means to execute this lens he would render great service to the world and secure for himself a high reputation. The result of the interview that ensued was that Voigtländer furnished the desired information respecting the qualities of the various glasses which formed the foundation of the calculation of two combinations of lenses executed by Voigtländer, one of these being the well-known portrait combination in use at the present time, the other the orthoscopic lens which was not introduced to public notice till 1857. The portrait lens was issued about 1841. Of all lenses extant, it is the one possessing the greatest angular aperture, by which term is understood the diameter of the lens in relation to its focus. In former times, when processes were less rapid than they now are, it is easy to conceive of the impetus given to portrait photography by the discovery of Petzval.

If a plano-convex lens, or one nearly of this form, be inserted in a camera and directed to the light, it will be observed that if the convex side be turned towards the view an image more or less sharp will be formed at the focus, but that the area of sharpness will be exceedingly limited. By reversing the position of the lens, turning the flatter side out, the opposite result is obtained—there is no sharpness anywhere, but a generally better and more uniform image all over the focussing screen. This arises from spherical aberration, the margin of the lens when thus placed bringing the rays to a focus anterior to that effected by the central portions.

The condition for reducing this confused definition to sharpness is that a diaphragm shall be inserted in front of the lens under such circumstances that the centre of the picture shall be formed only by the centre of the lens, no rays finding admission to the margin of the lens but those which come from the side of the view to be delineated, and thus fall upon the surface in a more or less oblique manner. This diaphragm is therefore absolutely necessary with a lens of the nature described, in order to secure flatness of field with good marginal, as well as central, definition. It is therefore necessary that the diaphragm be situated a little distance in front of the lens, because it is only when thus placed that rays are allowed access to the lens subject to the conditions mentioned, those which would mar the sharpness being thus excluded. It must not, however, be imagined that the same effect would be produced by reducing the diameter to the size of the aperture in the diaphragm, for in such a case, while the centre would be sharp as before, the sides would be badly defined.

What has been said of the plano-convex lens is also true of the meniscus. This latter lends itself, by its form, so well to the transmission of rays possessing a great degree of obliquity to the axis, that all lenses which are intended to embrace a wide angle of subject must be of this form; but the spherical aberration being greater in a deep meniscus than in a flat lens, a stop somewhat smaller is requisite in order to its reduction. The deep meniscus possesses properties of a well-marked difference from all others. Those who desire to see the finest exemplification of the so-called "depth of focus" possible to be obtained, have only to procure a meniscus of very deep form, expose its concave side to a bright object, such as a lamp flame, and observe the image. Having got it as sharp as possible, observe to what a great extent the lens may be moved backwards and forwards without the identity of the lamp flame ceasing to be reduced. It is true that it is surrounded by an aura of false light caused by excessive spherical aberration, but the form of the flame itself is still there. In a deep meniscus the diaphragm must be small and be placed comparatively close to the lens. This permits the transmission of a very oblique ray, the incidence of the ray being more normal than in the case of a flatter lens; hence the reason why all wide-angle lenses, whether single or in combination, must partake of the external form of the deep meniscus and the diaphragm be placed near to the lens.

Aplanatism is a somewhat ideal term, and cannot with strict accuracy be applied to photographic lenses. It was originally employed in 1791 by a Scotch *savant*, Dr. Blair, to denote lenses free from spherical aberration in like manner as achromatism signifies freedom from chromatic aberration. Popularly, it is held to designate an objective which gives sharp central definition with its full aperture, no diaphragm being employed. But this even an imperfectly corrected lens will do, provided its diameter be sufficiently reduced. We can, therefore, only talk in this connection by *degrees* of aplanatism, which

would be the better understood if we had a zero from which to start the scale. This zero might be made to equal f , or a diameter equalling the focus; but, at any rate, the term, as it at present exists, has not a sufficiently definite meaning. With this, by way of protest against the mythical expression, I observe that of all photographic lenses extant the old portrait combination is that in which the property of aplanatism, or maximum angular aperture, is greatest. As is the relation of aperture to focus, so is the intensity of the illumination. While a large angular aperture conduces to rapidity, in the same degree is it adverse to penetration, or the property of presenting on a plane surface, and with a degree of definition which satisfies the requirements of the artist, objects situated at various distances. This property of penetration or depth of defining, unthinkingly called "depth of focus," is a power of great value to the photographer, and is induced by means hereafter described. J. TRAILL TAYLOR.

(To be continued.)

Our Editorial Table.

ROUCH'S LEVER WATER SPRAY.

WE have before us a neat and useful addition to the furniture of the developing room, just introduced by Messrs. W. W. Rouch & Co. It is intended for attachment, by means of a flexible tube, to the water supply, and consists, as the diagram shows, of a brass tube and rose fitted with a lever stopcock, operated at will by the mere pressure of the finger and thumb. This form of cock is superior to the



ordinary tap, screw down or otherwise, on account of its easier manipulation, and to the numerous forms of "clips" in which an indiarubber tube is constricted by pressure, inasmuch as there is no indiarubber to "perish" and cause the arrangement to leak. The only rubber employed is in the form of a light band, which acts as a spring for the lever, and which may be removed or renewed in a few seconds if the valve is required to remain permanently open or in case of accident. The apparatus is equally adapted for washing negatives or prints, in the latter case the rubber strap being removed to the opposite side of the fulcrum of the lever, in order to keep the valve permanently open. The whole is strongly made, presents no parts likely to get out of order, and will form a decided ornament to the developing table.

HARMONIOUS COLOURING AS APPLIED TO PHOTOGRAPHS.

London: JAMES NEWMAN.

THIS is a new (the fourteenth) edition of a work which has for many years been before the photographic public. It is generally rewritten and revised to present date. Quite comprehensive in scope, the manual, which is of the most practical nature from beginning to end, treats of finishing in monochrome as well as in colours, in water and in oil pigments, in crayons, and by powder colours. Variations of methods to suit special classes of photographs, such as carbons, opals, platinotypes, lantern slides, even crysoleums, are given, together with a concise dissertation on the materials to be employed.

JAHRBUCH FÜR PHOTOGRAPHIE UND REPRODUCTIONSTECHNIK, FÜR 1887.

IN this Year Book, Dr. Josef Maria Eder has got together a large mass of useful and interesting matter, in which he has been aided by various collaborators. It contains several illustrations by woodcuts, zincotypes, and other processes. It is somewhat on the model of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, and is printed in the German language.

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1887.

Edited by J. TRAILL TAYLOR.

THIS well-known annual, which year after year has been increasing in dimensions (attesting its ever increasing popularity), has this year assumed a bulk which is truly portentous.

In addition to a series of short chapters on stereoscopic photography by the Editor, it is enriched by numerous articles written expressly for its pages by the ablest photographic exponents of the day, men

whose names are "familiar as household words" throughout the craft. It also contains those valuable features by which it has so long been distinguished, such as a synopsis of all inventions and improvements by which the past year has been distinguished, several pages of tabulated matter for photographers' reference, a complete list of new patents, formulæ for everything required to be known in the practice of the art, together with a compendium of practical receipts extending over many pages.

It would obviously be a breach of professional etiquette, at least in this country, for us to express an opinion on the work, but this does not apply to reproducing what others have said. Among others, the following from Mr. "Luke Sharp," the genial editor of the *Detroit Free Press*—himself an active photographer—may serve as a type of the spirit in which our annual is received by the press:—

"To say that THE PHOTOGRAPHIC ALMANAC OF THE BRITISH JOURNAL OF PHOTOGRAPHY is edited by Mr. J. Traill Taylor is to bestow on the bulky volume about as warm a recommendation as it is possible to give. Wherever the tripod of a photographer is set up, THE PHOTOGRAPHIC ALMANAC is recognised as an authority which it is impossible to do without. Immense numbers of these books are sold in America, although the price there is just double what it is in England. The book contains more than 600 pages, and the photographer, amateur and professional, will find it one of those rare volumes where the advertisements are no less interesting and instructive than the varied and well-written text."

We learn from our publishers that whereas 15,250 copies of the annual have this year been printed, it is their intention that the next year's issue shall reach, and possibly exceed, 20,000 copies.

Department for Inexperienced Photographers.

OVER AND UNDER EXPOSURE.

IN describing the development of a negative, we have assumed that it has hitherto been a case of plain sailing with the photographic tyro. We now proceed to mention some of the rocks or pitfalls which may lie in the way.

If upon applying the developing solution the image takes a very long time to appear, it may be concluded that either a too brief exposure has been given or that the developer is too weak. If the former be the case, it will be signified by the high lights eventually acquiring vigour, the deep shadows being either exceedingly tardy in appearing or failing to come out at all. If, on the contrary, there be no such wide distinction between the lights and shadows, but only a general disinclination of any image to appear, the presumption is that the fault lies with the developer. The remedy in this latter case is to increase the proportion of the alkali, which treatment will never fail in bringing out the details. As we have said before, it is not wise to add so much as to render the development too rapid. Again, it happens with many brands of plates that the presence of alkali in such a proportion as would effect a very quick development may fog or veil the shadows. This is prevented by the addition of two or three drops of a fifteen-grain solution (*i.e.* fifteen grains to an ounce of water) of bromide of potassium or bromide of ammonium, the function of which is to prevent any abnormal development on the shadows, or to keep them clean. But owing to the retarding influence of the bromide it must be used sparingly. However, it permits of the employment of a larger amount of alkali than it would be safe to introduce into the developer without such a check upon its energy. It is not quite easy to say precisely how much ought to be added, because of the diversity in character of commercial plates, the best treatment for one brand not being necessarily that for another. There are some plates which require no bromide at all, while others are very liable to fog unless a liberal proportion is present.

Should the image make its appearance with too much equality all over, the shadows coming simultaneously with the lights, it may be taken as evidence of over exposure. In this case it is necessary to act promptly, and at once to pour the developer back into the graduate or cup, and add to the solution a liberal dose of bromide, say four drops or more, according to the circumstances of the case, and having stirred the solution so as to mix it well up return it to the plate. The object of this is to retard the action of the developer upon the shadows, which are thus held in check, while the developing action goes on in the high lights. Under this altered condition of the developer the plate may be subjected to its action for a prolonged period without danger of the shadows becoming fogged. If it is known beforehand, or very strongly suspected, that the plate has received much too long an exposure, then will it be wise to introduce two or three drops of the bromide solution along with the pyrogallol acid previous to adding any alkali at all, as this will in some measure ameliorate the effect of over exposure, while the alkali may also have its action checked by a similar addition of bromide.

What has been here said applies, of course, to pyrogallol development, and it can be readily inferred that by an intelligent adjustment of the component parts of the developer, or perhaps, more correctly speaking, of the alkali and the bromide, a considerable latitude in the exposure is permissible. In all photographic operations development, more than any other, requires the exercise of judgment. Almost everything else can be effected by a hard-and-fast rule, but development is amenable to the intelligence of the operator, an intelligence that must be exercised in the case of every individual plate.

In ferrous-oxalate development there is not the same degree of latitude as in that by pyrogallol acid, although in cases of over exposure the latent or even partially developed image is amenable to the retarding influence of bromide, a few drops of which may, especially at the initial stage of development, be added with marked advantage.

Another factor in facility of development is weakening the developer by the addition of water. But concerning the effects of this we shall have occasion to speak more fully when we come to consider the best circumstances under which to develop snap shutter or instantaneous exposures.

The darkening of the pyro developer, which not unfrequently becomes of a muddy-looking nature after remaining on the plate for a few minutes, may be prevented by sulphite of soda. One of the best ways to employ this salt is to saturate with it the water in which the pyrogallol acid is dissolved. Provided this is done, an aqueous solution of the acid may be made which will keep good for a long time, whereas if it be dissolved in water alone without the sulphite it will decompose with so great a degree of rapidity as to render its preparation in this way a loss.

There are several other additions which may be made to the solution which will prevent the pyro from decomposing, but the consensus of opinion points to sulphite of soda as being the best at present known. It will prove highly educational to the beginner if he will develop a plate without such addition, and note the state in which he finds the developer at its close, and afterwards go through the same operation with a second plate, a liberal proportion of sulphite being mixed with the developer. So clear will it remain in the latter case, compared with the muddiness of the former, that he will be tempted to use it over again on the succeeding plates, which may, in many instances, be done with advantage.

SOCIETY OF ARTS.

At a meeting of this Society held on the 26th ultimo, Mr. James Glaisher, F.R.S., President of the Photographic Society of Great Britain, in the chair, Mr. J. Traill Taylor read a paper on *Photographic Lenses* [see page 72].

Mr. J. Mayall, jun., said he noticed in the early part of the paper a reference to the term *aplanatism*, but it appeared to him that the expression was perfectly well defined by the classical writers on optics. Coddington, the well-known inventor of the lens which bore his name, in a treatise on the *Reflection and Refraction of Light* in 1829, defined it as meaning freedom from spherical aberration; and that definition was adopted by Sir John Herschel in his famous treatise on "Light" in the *Encyclopædia Metropolitana*. He could not but think that if in the description of photographic lenses it was used in any different sense—for instance as Mr. Taylor employed it, as meaning the angular aperture of a lens—it was an extraordinary misapplication of the term. Of course he did not attribute the origination of that idea to Mr. Taylor, because it had been more or less used in popular treatises on photographic lenses, and even in Menckhoven's work on photographic optics. Mr. Taylor had referred to a great number of lenses of the old type, many of which were quite obsolete and of no use whatever. On the other hand, he had touched on certain lenses recognised throughout Europe as showing the highest point of excellence which had yet been reached. He took it that since the application of the dry-plate process the old Petzval form, in which an extraordinary aperture was given in relation to the focal length, was practically useless, and every one now used lenses having much less aperture, but where the *aplanatism* was infinitely more perfect. Reference had been made to the lenses made by Steinheil, in which flint glass was used for the external lenses. That point was taken up by a distinguished mathematician in Paris some ten years ago, M. Prazmowski, the partner of Hartnack, the eminent microscope optician, and it led him not only to utilising flint glass for the external lenses, but also to combining different kinds of flint glass, and he had a very distinct aim, namely, to get rid, in portrait lenses, of the separation in the back combination, which he obtained by using two different kinds of flint glass for each combination, and thus producing a lens with a very short focus, with each combination cemented, so that the reflection given by the surfaces being exposed to the air was got rid of. One of the first lenses thus made was made for him, as the result of a long discussion with Prazmowski, and having brought it to London he thought it would be interesting to Mr. Dallmeyer to see it. He remained about an hour while he tested it, but he was surprised to find that, although he was

known to have considerable technical knowledge, he had not the slightest conception of the nature of the combination,* how the problem of getting rid of the separation of the back lenses was solved, or that the lenses were constructed wholly of different kinds of flint glass, no crown being used. He must confess that even that was now a thing of the past, because it dealt with lenses of the Petzval construction, with great aperture and short focal length, which might now practically be looked upon as out of date. With regard to new kinds of glass for use in lenses, Mr. Taylor seemed to think it was too soon to deal with that question, but he should like to say a word or two on the optics of the future, as they might be developed by new kinds of glass which had lately come into the market. It was perfectly well known in the microscopical world that some time ago one of the most distinguished mathematicians in Europe, who had paid special attention to practical optics, Professor Abbe, of Jena, and his friend, Dr. Schott, had worked out an immense number of experiments with the purpose of providing new kinds of glass which would combine a greater number of lines in the spectrum than had been hitherto combined. Of course that in itself was old, some of our most able mathematicians, such as Professor Stokes, Mr. Grubb, and the late Dr. Robinson, having applied themselves to the problem, any time during the last thirty years; but, unfortunately, their experiments had not ended in any practical result. In this case, however, Professor Abbe being the theorist, and Dr. Schott a practical man, there was a combination which led to a much more exhaustive series of experiments, and the result was that new kinds of glass were really discovered. The earlier experiments they made were not very remunerative; they took a deal of time, and did not lead to any commercial result; but the German Government generously came forward and voted a large sum of money in order that the experiments might be continued. The practical result, so far, had been shown in two ways. First of all, telescopes of considerable aperture had been made by Bamberg, of Berlin, as high as eight inches of clear aperture; and as regards achromatism there could be no doubt he had reached a point which had never been attained before. That, of course, would be shown in practical results by the extremely convenient use of deep eye-pieces. It was well known that when these were used with a telescope in which the chromatism was imperfect, a flare of clouded fringes was produced; but with the new glass the chromatic aberration appeared to be more highly corrected. Turning to a point more interesting to himself, this glass had been used for the improvement of microscopical lenses, and a new series had been manufactured by the well-known optician, Zeiss, of Jena, and there could be no doubt that he had attained more perfect corrections through a larger extent of aperture than in any of his objectives of previous construction; these objectives were, therefore, aplanatic in the sense in which the term was used by our classical writers on optics. As regards achromatism, the superiority over lenses manufactured with the older media was unmistakable. Seeing these results, he could not help thinking that photographic lenses also might be much improved by the use of this Jena glass. He thought photographers had a right to expect from opticians that the necessary energy should be devoted to the problem of endeavouring to utilise these new kinds of glass, and to attaining results in photographic lenses comparable with those which had been obtained in the microscope. He was informed by Professor Abbe that Steinheil had had a good many samples of this glass, and that he had seen his way at any rate to improved forms, and before long he believed there would be an issue of new lenses by Steinheil, made of this material, in which a higher degree of achromatism would be attained with larger and flatter field. If English opticians did not follow in the same path, they would not deserve the support they had hitherto had in England and abroad, where their reputation stood very high indeed. In France, Germany, and Italy, photographers, both amateur and professional, spoke of the quality of English lenses with great respect, and referred to them as being of a somewhat higher standard in the matter of workmanship than almost any produced on the Continent, not in the more technical execution, but in evenness of quality, so that if a foreigner gave an order to an English firm, he would be almost certain to get a lens of a high standard of excellence. Many people here who had obtained lenses from abroad had not been so successful, and he might say that he had burnt his fingers more than once. If you sent for a lens to Paris you might get a good one, but the chances were you did not.

Mr. Henderson asked what lens Mr. Taylor would recommend, apart from portability, as best suited for an optical lantern.

Mr. Shew asked whether the wide-angled lens shown on the screen by Morrison, containing a single back lens, gave straight lines—was it rectilinear?

Mr. Debenham said he thought justice should be done to the memory of Petzval, and he was sorry to hear his lenses referred to by Mr. Mayall as things of the past, and to hear it said that they were infinitely behind newer combinations in aplanatism. According to Mr. Mayall's view, they were the only truly aplanatic lenses, because by his definition such a lens was one free from spherical aberration, and the peculiar characteristic of Petzval's lens which stamped it as the work of a great genius was the

freedom of spherical aberration. This he obtained by separating the back lenses, and this had always been considered a great mathematical triumph. All portrait lenses, up to the present, had been constructed on that principle, with, in some cases, slight variations, such as reversing the back lens, but the great principle was the separation of the back lens into two parts, one of which had sufficient negative spherical aberration to overcome the entire positive aberration of the system, and so render it aplanatic. Several so-called aplanatic lenses had been introduced since, the first being the single lens of Grubb. Of course, the term merely meant that the lenses were on the way to being aplanatic; perfection did not exist in anything; those that came pretty near to it were entitled to be so called; and for a single lens, Grubb's was a nearer approach than anything before. Then Steinheil—another man whose genius would always be admired whenever photographic lenses were spoken of—introduced a combination which he called aplanatic, because it was so nearly so as to allow of tolerable definition with a focal length of only seven times that of the aperture. The Petzval was four times the length, and sometimes less than that; and if any lenses existed more strictly aplanatic than Petzval's portrait lenses, he should be glad to hear of them. Petzval's served as a model for all lenses, and Steinheil's as the model for a host, for all the opticians imitated him. No doubt, photographers would wonder why their pet lenses were not referred to in such a paper as the present, but the fact was, if those they were in the habit of using were merely copies or slight variations from these leading original types, it would not be proper, in a scientific lecture, to speak of them as originals. One of the most perfectly aplanatic lenses was Steinheil's portrait antiplanat; unfortunately, it lacked perfect flatness of field, more so even than Petzval's, and therefore, though it gave exceedingly fine definition over a small field, it required either a curved plate or to be used only with a very small part of the field to get perfect definition. Perhaps the most ideally perfect photograph which could be obtained would be one in which the curvature of the field was neglected, the plate itself being curved to receive the image. If the reproducing and enlarging processes were as perfect as they were sometimes said to be, the photograph could be taken in this way, but the plate would have to be in the shape of a bowl; it would be difficult to manage, to develop, and so on, and then it would have to be reproduced on a flat plate before it could be made use of for printing, and reproducing processes were not as yet so perfect that this method was at all likely to come into use. One lens Mr. Taylor had shown which he believed had gone out of use, which was much to be regretted, the wide-angle doublet of Ross. Its place had been, to a large extent, taken by another combination of Steinheil's, the wide-angle aplanatic, which certainly had the advantage of greater portability. In covering a large field on a flat plate, the essentials were—first, the field must be flat; therefore, the marginal pencils must be much longer in focus than the central ones, and that condition was fairly fulfilled in the lens in question. Another defect in very wide-angle views arose from the angle of illumination; the corners of the picture received much less light than the centre. The diaphragm opening, looked at from the marginal part of the picture, only represented an oval, having its longer diameter of the same size as the circle which was available for the central part of the field; in the next place, the corners were further removed from the diaphragm, and the image, therefore, was more separated, and thus again the corners received much less illumination than the centre. There was yet a third difficulty arising from the reflection at the surfaces of the lenses.

Mr. Werge said he should be glad if Mr. Taylor could tell him how to determine the focus of a pinhole, as pictures of large and small size could be produced thereby.

Mr. Traill Taylor, in reply, said Mr. Werge was very well aware that, according to the distance of the pinhole from the screen on which the image was received, so would be the magnitude of the image. If it were six feet away it would be large, if only six inches it would be small. The object of the pinhole was to produce an image of the same dimensions as that given by the lens in question, and that could be done by moving the pinhole backwards and forwards until the two images coincided. That was all that was wanted. He made no mention of the focus of a pinhole. Continuing his reply, he said the best lens for a short studio was a short focus lens, and you should get the camera as far away from the object as possible. With regard to lenses for optical lanterns, according to Mr. Mayall, there were none, because it was a thing of the past; but he really thought he could not have been mixing so freely in the photographic world as he ought, or he would know that the Petzval was the lens *par excellence*—the only thing which could be employed for an optical lantern, either for projecting or enlarging, owing to its adaptability. Petzval's portrait lens was the one for the lantern; it was used in the lantern that evening and everywhere else, and he was a little surprised to hear Mr. Mayall say that it was a thing of the past. The most eminent opticians in the world were making them constantly. They might call them universal lens, or the A, B, C, or D lens, or any name they liked, but they were all Petzval lenses, and they were in constant use. The same gentleman had referred to a cemented back. Amongst the first lenses that emanated from the factory of Voigtlander were lenses with cemented backs; they were triple compound lenses of enormous aperture and very short focus, capable of working, as was facetiously said, in a coal cellar. Voigtlander took out a patent for that again a few years ago, and portrait lens with cemented backs were things of the present day. Mr. Mayall

* There must be some misapprehension here on the part of Mr. Mayall. The late Mr. Dallmeyer was far too good an optician not to have realised the precise nature of the lens the moment he got it in his hand. We know as a fact that at the time alleged Mr. Dallmeyer was intimately conversant with the whole problem of cemented back lenses, and it is well known that also at the time alleged, and even ten years anterior, lenses "constructed wholly of different kinds of flint glass" were regular articles of commerce.—Eds.

had also referred to lenses being made wholly of flint. When he described Steinheil's invention, he characterised it as being made of two kinds of flint glass, the denser element outside; and all the lenses of the present day characterised by the term "rapid," with the exception of the one he had spoken of as being American in inception, were made with two kinds of flint glass, the denser element outside.

The Chairman, in proposing a hearty vote of thanks to Mr. Taylor, said he hoped the new glass would cause so great an improvement in photographic lenses, that the next time they had a paper from Mr. Taylor he would include it, and show the progress which had been made.

The vote of thanks was carried unanimously, and the meeting adjourned.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 1465.—"Improvements in or connected with Photographic Cameras and the Sensitive Media for Exposure therein." W. NORTH and K. L. NORTH.—*Dated January 29, 1887.*

PATENTS COMPLETED.

IMPROVEMENTS IN THE STANDS OR SUPPORTS FOR PHOTOGRAPHIC CAMERAS. No. 2423. ARTHUR RAYMENT, 36, Beatrice-road, Finsbury Park, Middlesex.—*February 19, 1886.*

This invention has for its object improvements in the top part of the tripod stand or other support for photographic cameras, whereby the camera can be readily moved into any required position and placed at any desired angle.

In carrying my invention into practice I construct the top of a tripod, or other stand or support in two parts, hinged so that they will fold or lie closely together; for convenience of description I will call one part the "upper" and the other part the "base."

The special use of these parts is that whilst the base part is attached to the legs, clip, or other support, the upper part (acting upon hinges) may be adjusted so as to enable the operator to turn the camera to take a photograph at any desired angle or position.

Another motion is provided where the camera is oblong shaped (so as to maintain approximately the centre of gravity of the camera during or when ready for an exposure), the camera being attached to the upper part of the aforesaid tripod top, which part is hinged to a sliding piece arranged in and combined with the base part; the camera is slid or drawn back on this piece (which is adjusted or fixed at the desired point by a suitable spring catch) and then changed from the horizontal to a vertical position, or *vice versa*, thus obviating the weight of the camera when so changed causing unsteadiness or overbalancing by being thrown outside of the centre of gravity of the support or stand.

The relative positions of the parts are secured at any angle desired by means of a suitable spring between the two parts, or by a slotted rod fixed to one part and clamped on the other by a set screw, or by a piece of wood or metal arranged and forming an arc between the ends of the two parts, and adjustable by a set screw, or by any other convenient method.

A hole or recess is formed in the "base," so as to allow the screw, which serves to secure the camera to the upper part, to pass through when the two parts are lying closely together.

Any suitable material may be used in the construction of the several parts, which may be varied or modified, if desirable.

IMPROVEMENTS IN OPTICAL LANTERNS.

No. 3805. HENRY MARTYN WHITEFIELD, 54, Yarbrough-street, Manchester, and SAMUEL WASHINGTON, 19, Radnor-street, Manchester.—*March 18, 1886.*

This invention relates to optical lanterns. The object is to effect a rapid change of the pictures exhibited on the screen by a single lantern and by means of a novel arrangement for shutting off the light, to do this without the changing of the picture being visible, and to prevent any possibility of vibration or movement of carrier during the insertion of a new slide.

The invention consists in fitting in the front part of the lantern, between the condensers and objectives, a suitable shutter or shutters worked from behind the lantern by means of a shaft running from front to back, and having a handle fitted to it. A cam and crank fixed on the end of the shaft closing the shutters and opening them again. Whilst the shutters are closed, a lever acted upon by the crank is made to pass forward a double carrier, thus changing the picture; the carrier is now held firmly in position by a powerful spring and the shutters are opened again, when the new picture appears upon the screen. These combined movements are effected by one half turn of the handle, and, being almost instantaneous, the sheet is darkened only for a moment, besides which, the ludicrous effect of landscapes, &c., sliding across the sheet, produced by changing the pictures in the manner that has hitherto been customary, is entirely avoided.

The claims are:—1. The combination with the shaft passing from the back of the lantern of the cam, levers, springs, and shutters or fans, substantially as and for the purposes described. 2. The combination with the shaft passing from the back of the lantern of the cam, hinged flap, and springs for holding the carrier in position, substantially as and for the purposes described. 3. The combination with the shaft passing from the back of the lantern of the crank and lever for changing the carrier, substantially as and for the purposes described. The specification is illustrated.

WE are requested to state that Mr. H. H. O'Farrell, who has lately been making some experiments on the sulphuration of platinotype prints, will exhibit his results and read a short paper on the subject at the ensuing Conference of the Camera Club, at the Hall of the Society of Arts, on Tuesday next.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
February 7.....	Notts	Institute, Shakespeare-street.
" 7.....	Blackburn	
" 8.....	Great Britain	5a, Pall Mall East.
" 8.....	Newcastle-on-Tyne & N. Counties	Coll. of Physical Science, Newcastle.
" 8.....	Manchester Amateur	Masonic Hall, Cooper-st., Manchstr.
" 8.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 9.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 10.....	Birkenhead	Free Public Library, Hamilton-st.
" 10.....	Bradford Amateur	Grammar School.
" 10.....	Cheltenham	4, Clarence-street.
" 10.....	Halifax Photographic Club	Mechanics' Hall.
" 10.....	Manchester Photo. Society	36, George-street.
" 10.....	London and Provincial	Mason's Hall, Basinghall-street.
" 11.....	Ireland	Royal College of Science, Dublin.

PRESENTATION OF A TESTIMONIAL TO JAMES GLAISHER, F.R.S. LAST Monday night a large number of the members of the Photographic Society of Great Britain presented Mr. James Glaisher, F.R.S., the President, with a marble bust of himself, as a mark of the esteem in which he is held by them; the event took place at a dinner at the Holborn Restaurant, London, at which a large number of ladies and gentlemen were present, all the seats at five or six long tables being occupied.

Mr. W. S. BIRD, who took the chair, expressed regret at the absence of Captain Abney, who was to have occupied that position, but was prevented by the serious illness of a member of his family. He then read the circular which had been posted to the members, proposing that the testimonial should be presented, and setting forth the long and valuable support which Mr. Glaisher had given to the Society by his long years of earnest work; he next read letters from various noted photographers who were unable from illness and other causes to attend, including, among others, Captain Abney, Colonel Stuart Wortley, Messrs. H. P. Robinson, Henry White, John Spiller, Frank Bishop, J. Stuart, H. Trueman Wood, and Joseph Paget. The speaker said that Mr. Glaisher had furthermore done much good to the Society by reason of his great eminence in the scientific world. A reference to the catalogue of the Royal Society proved that he had contributed to that Society no less than fifty memoirs, the majority of which were on the subject of meteorology, for Mr. Glaisher had been for forty years the chief of the Meteorological Department of the Royal Observatory at Greenwich. He had made twenty-nine balloon ascents for scientific purposes, to take observations on the following points, namely:—1. Temperature of the air and its hygrometrical condition at different elevations. 2. Temperature of the dew point, also, as bearing on sanitary questions in relation to living on great heights or quartering troops. 3. The comparison of the aneroid and mercurial barometers. 4. The electrical oxygenic conditions. 5. Vibrations of a magnet on the earth and at various distances from it. 6. Height and character of clouds. 7. Rate and direction of currents of wind. 8. Observations on sound, and other memoranda of aerial physics likely to serve the general principles of the science of meteorology and lead to practical and beneficial results. In one of his ascents, when, on September 5, 1862, Mr. Glaisher started from Wolverhampton, the barometer indicated 29,000 feet of elevation, he passed on the way through a cloud 8000 feet deep and so dense that the balloon could not be seen from its own car. Of this voyage Mr. Glaisher reported:—"I asked Mr. Coxwell to help me to read the instruments, as I experienced a difficulty in seeing. In consequence, however, of the rotatory motion of the balloon, which had continued without ceasing since the earth had been left, the valve line had become twisted, and he had to leave the car and mount into the ring above to adjust it. At this time I looked at the barometer and found it to be ten inches, still decreasing fast; its tone reading therefore was nine and three-quarter inches, implying a height of 29,000 feet. Shortly afterwards I laid my arm upon the table, possessed of its full vigour, and on being desirous of using it I found it powerless—it must have lost its power momentarily. I tried to move the other arm and found it powerless also. I then tried to shake myself, and succeeded in shaking my body. I seemed to have no limbs. I then looked at the barometer, and whilst doing so my head fell on my left shoulder. I struggled and shook my body again, but could not move my arms. I got my head upright, but for an instant only, when it fell on my right shoulder, and then I fell backwards, my back resting against the side of the car, and my head on its edge; in this position my eyes were directed towards Mr. Coxwell in the ring. When I shook my body I seemed to have full power over the muscles of the back, and a considerable power over those of the neck, but none over either my arms or legs; in fact, I seemed to have none. As in the case of the arms, all muscular power was lost in an instant from my back and neck. I dimly saw Mr. Coxwell in the ring, and endeavoured to speak, but could not; when in an instant intense black darkness came, the optic nerve finally lost power suddenly. I was still conscious, with as active a brain as at the present moment while writing this. I thought I had been seized with asphyxia, and that I should experience no more, as death would come, unless we speedily descended: other thoughts were actively entering my mind, when I suddenly became unconscious as on going to sleep. I cannot tell anything of the sense of hearing; the perfect stillness and silence of the regions six miles from the earth (and at this time we were between six and seven miles high) is such that no sound reaches the ear. My last observation was made at 1:54 at 29,000 feet. I suppose two or three minutes fully were occupied between my eyes becoming insensible to seeing fine divisions at 1:54, and then that two or three minutes more passed till I was insensible; therefore I think that took place at about 1:56 or 1:57. Whilst powerless, I heard the words, 'Temperature' and 'Observation,' and I knew Mr. Coxwell was in the car speaking to me, and endeavouring to arouse me; therefore consciousness and hearing had returned. I then heard him speak more emphatically, but I could not see, speak, or move. I heard him again say, 'Do try; now do.' Then I saw the instruments dimly, then Mr.

Coxwell, and very shortly saw clearly. I rose in my seat and looked round, as though waking from sleep, though not refreshed by sleep, and said to Mr. Coxwell, 'I have been insensible.' He said, 'You have; and I, too, very nearly.' I then drew up my legs, which had been extended before me, and took a pencil in my hand to begin observations. Mr. Coxwell told me that he had lost the use of his hands, which were black, and I poured brandy over them." He, the Chairman, was pleased to say that there had been 133 subscribers to the testimonial, and pleasing letters had been received from some members who were unable to do, financially, so much as they desired; he was also glad to say that they had a poet in the Society who had written the following lines in honour of the President and of the event of that evening:—

"You marble bust reveals the face of one
Whom Science claims, for battles fought and won;
Yet not in deadly conflicts, such as those
Which fill this world with pain and mighty woes;
But in that higher life, where men of mind
Serenely toil to benefit mankind.
There, 'midst the truest heroes of our race,
The name of GLAISHER holds an honour'd place;
And here we fitly celebrate to-night
His reign o'er those whose kingdom is the 'light.'
Well has he governed, with strong, guiding hand,
Where 'Truth' and 'Equity' both take their stand;
Then honour give for many years thus spent,
And greet we him—our worthy PRESIDENT."

The bust bore the following inscription upon a silver plate on its pedestal:—
"Presented to James Glaisher, F.R.S., etc., etc., by Members of The Photographic Society of Gt. Britain, in recognition of eighteen years' devotion to its interests as President and as a token of their affection and esteem. January 31st, 1887."

Mr. JAMES GLAISHER, in returning thanks, said that he had a difficulty in finding words to express his feelings. Years ago, Dr. Diamond, and others, had pressed him very much to be put into marble. In its early days the Photographic Society had been a fashionable one; Sir C. Eastlake was then its President, and a meeting of the Society was never held without a *recherché* banquet before it began; the then Secretary had a salary of £200 a-year. When fashion left the Society, it fell into debt; the Secretary still claimed his salary, and the printers threatened him (Mr. Glaisher) with an action if he did not pay their bill of a few hundred pounds. But the Council and members worked and worked, until at the present time they had a balance on the right side, and they no longer had debt to check their progress as it did in the past, when he came to hate the words "No funds." Photographic portraiture had brought pleasure to thousands of homes, and photography was now the handmaid of astronomy and of the other sciences. The exhibitions of the Society had helped to keep every one up to the mark; although at the last one there were no exhibits from Bedford—father or son, none from England, none from Robinson, none from Blanchard, it yet showed progress in every department. Especially had photography improved in its art aspects. He should like to see photographic energy more concentrated, for science had been a bad housekeeper, incurring a variety of expenses which might have been lessened by all pulling together, and he hoped that photographers would not follow the example; union was wanted, and it was desirable the photography should have a home of its own. He had been pained to read in THE BRITISH JOURNAL OF PHOTOGRAPHY that the frames sent to the last exhibition had been scratched; he had seen the pictures handled there as tenderly as a mother would handle her new-born babe, and an endeavour had been made to take every care. Mr. Cocking had made inquiries into the matter, and discovered the complaints to be well founded. Then it came out that they were but tenants, and that in the building was a dread mid-passage through which the pictures had to be carried; what injury they may have had there he knew not, but next year the Society must give protection against such damage. The Society had now a little in the Consols and a balance in hand, therefore it could now have its library, its laboratory, and a number of other conveniences. He was glad to see such a large number of ladies present; under the presidency of the Chief Baron at King's College there were always ladies present at the meetings of the Society, and he hoped that more would come as members or visitors. The now unveiled bust seemed to him, at that distance from it, to be an admirable one; it would never have been executed had it not been for his friend on his right, the Rev. Dr. Lausdell, who had travelled in Siberia, Bokhara, and other far-away places. The sculptor, Mr. Toft, threw his heart into the work, as he could see by his looks at the first one or two sittings; so he sat for him as frequently as he could, and when he left London the bust was finished below the chin by the aid of photographs. His time as President of their Society was probably limited, but what they had done that evening would encourage those who came after him, and he returned his warmest thanks to all.

Mr. Glaisher here sat down amid loud applause, the music and the company then striking up "For he's a hearty good fellow."

Mr. FRANCIS COBB then proposed the health of the Chairman, saying that once a Member of Parliament, aggrieved by an opponent, complained:—"Does the honourable member think that I can be in two places at once, like a bird?" Well, the Society had caught that Bird, and he had done all the real work of the testimonial committee.

Mr. W. S. BIRD having retired thanks.

Mr. PAYNE JENKINS proposed "Success to Photographic Art and Science," saying that he was in special sympathy with the artistic aspects of photography. The Society wanted a gallery of its own, so the next thing as Englishmen to do, was to have it.

Mr. JOSHUA SMITH, Ex-President of the Photographic Convention of America, responded.

The CHAIRMAN next proposed the health of Mr. Albert Toft, the sculptor of the bust, who, he said, was a rising young scholar, who was winning golden opinions from the lovers of the art, and had been very successful at exhibitions.

Mr. TOFT responded that he had taken a special pleasure in chiselling the

bust before them, and should always feel grateful to the Photographic Society, for helping him over the first stepping stones of his career.

Mr. W. ENGLAND proposed "The Ladies," to which Mr. G. L. Addenbrooke responded.

Several glees were sung during the evening by Messrs. Blanchard, Pearce, and Cocking, among them being the following, written for the occasion, and adapted to well-known music:—

"In the merry old times of photographers,
When the wet silver bath ruled here,
(They'd collodion as well,
As their chronicles tell),
And got fogged every day in the year.
"One day, when their baths went awfully wrong,
They carried them into the light,
And commanded the Sun,
(As he'd hitherto done),
To make all those baths clean and bright.
"But old Sol, in a pet, roll'd out a remark,
That the time for such work was all over;
And he foamed and he roared,
'We're not in accord,
As you all very soon will discover.'
"Then the President summoned his Council so wise,
'Here's a pretty to-do!' quoth he;
'We're on the wrong path
All along of that bath,
And old Sol's in a flat mutin-ee;
To quell revolution,
We'll drink the solution,
And go in for gelatin-ee.'"

Recitations and songs were also given by Messrs. W. Cobb, Valentine Blanchard, A. Cowan, sen., A. Cowan, jun., and by two professional singers, Mr. Arthur Thomas and Mr. Laird Donald. The pianist was Mr. Alfred Smythson.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday, January 27, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. J. Traill Taylor presided.

Mr. A. L. HENDERSON said that by the use of yellow glass he had succeeded in getting as good results upon ordinary plates as Mr. B. J. Edwards did with orthochromatic plates, but the latter "scored" against him in photographing deep blue-black discs upon a yellow ground. He exhibited the results he had obtained.

The CHAIRMAN stated that Mr. Bierstadt, of New York, had long been in the habit of photographing paintings by interposing the proper kind of yellow glass; the time of exposure had to be lengthened.

Mr. HENDERSON had found the quality of Mr. Edwards's plates to be very good indeed; they were a little slow, and they gave good negatives. Mr. Edwards had said that they were not stained; he had found, however, that when they were moistened and warmed a distinct pink stain put in an appearance.

The CHAIRMAN knew a man who had been trying to make plates orthochromatic with red ink, which was usually composed chiefly of eosine and gum arabic.

Mr. A. MACKIE had heard that Mr. Friese Greene used the colouring matter of the beetroot for the purpose.

Mr. W. M. ASHMAN said that Mr. Friese Greene had told him that the beetroot extract had a very good effect.

Mr. HENDERSON called attention to a circular of "Cellerier's Syndicate, Limited," which related, he said, to a process as old almost as photography itself, and consisted chiefly in colouring photographs from behind. Some such, produced by Léon Vidal, were on view in the Paris Exhibition many years ago. Cellerier's Syndicate was trying to raise a large amount of capital.

The CHAIRMAN thought Cellerier's process to be a coloured photograph at the bottom with a thin photograph upon the top.

Mr. HENDERSON read the claims in the Cellerier patent, which was dated 1885.

The CHAIRMAN thought that the first patent for that kind of thing was taken out in 1865 or thereabouts by Ashton, of Birmingham; he chromo-lithographed in colours, then printed a photograph thereupon, a picture in colours being the result. Another process, something like Cellerier's, had been used by those persons who induce ladies of limited means to give a few guineas for tuition. Madame Una Howard years ago practised a process in which a sheet of paper was printed in pretty strong colours, and placed upon that was a photographic print rendered translucent; a very pretty effect resulted. The changes rung upon this method of producing photographs had been innumerable.

On the motion of Mr. ASHMAN, it was resolved that Mr. Henderson be appointed a committee of one to make inquiries about the Cellerier process, and to report to the next meeting.

Mr. A. COWAN exhibited a gelatino-chloride print developed with magnificent blacks upon opal glass without any toning; ferrous citrate was used as the developer; before it was applied there was no visible image on the plate.

The CHAIRMAN and Mr. ASHMAN thought the process to be very valuable.

Mr. J. HUBERT said that when he read his forthcoming paper to the Association on collodio chloride printing he hoped the members would bring forward for discussion all the reasons they could against the process being introduced.

Mr. ASHMAN said that whenever photographers had tried practically to introduce new processes the public had insisted upon still being supplied with albumenised prints. Twenty years ago collodio-chloride prints were turned out in America by the million.

The CHAIRMAN said that very few were turned out there now, and that Mr.

Jabez Hughes, after producing them for a time in this country, gave up the attempt.

Mr. F. W. Edwards was elected a member of the Association, and the proceedings closed.

DERBY PHOTOGRAPHIC SOCIETY.

THE annual *conversazione* of this Society, held in the St. James's Hall on the 26th ultimo, was very successful. The side walls of the building were covered with beautiful specimens of photography, obtained by different processes, while the centre of the room was occupied by other photographs, various kinds of cameras, and other appliances.

Captain ABNEY opened the proceedings by delivering a brief address. He said that he believed that in the human breast there was always a yearning either for science or art. If any one wished to become a scientific man he could not do so without knowing something about photography. It was not everybody who could draw and paint, but yet they might possess a true artistic feeling, and photography was the legitimate expression of a yearning for art—that yearning by which they expressed on a plate that which they failed to express by means of the fingers. Again, those who had not time to learn either drawing or painting should take to the camera, and thus express their artistic feeling by means of the plate. A great deal more was now known than formerly about the sun and moon, and the star depths which the photographic plate had shown to exist beyond what they could see. Photography was an unerring recorder of facts; it possessed no personal bias or error, and if they wanted to be correct they must photograph what they saw, and not trust to impressions. Captain Abney concluded his remarks by giving ten reasons why all present should become photographers and join the Derbyshire Photographic Society. The first, and perhaps the most important reason, was that it would give them outdoor exercise, which, to persons leading a sedentary life, was very valuable. The second reason was that the art trained the eye, and they could never thoroughly appreciate nature until they had received that training. Another reason was that it trained the hands, making them neat and skilful. It also taught patience, a most important principle. It also taught people to think, and he believed that any person who passed through life without it was not fit to live. Photography also gave rise to a healthy and unselfish competition, as was evident by the large collection of splendid pictures which now adorned the walls of that hall, and was an unerring register of facts. The practice of photography was a sensible amusement; it was the first step to chemical and physical science; and, lastly, if they tried the art they would like it.

After Captain Abney's address a musical programme was gone through, and several slides were shown during the evening.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Thursday, the 27th ultimo, at the Royal Institution, Colquitt-street.—The retiring President, Mr. P. H. Phillips in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. PHILLIPS then introduced his successor for the current year, Mr. George H. Rutter.

A cordial vote of thanks was given to the retiring officers.

The following gentlemen were unanimously elected members of the Association:—Messrs. William H. Coward, W. Tomkinson, and W. Priestnall.

The Treasurership having been declared vacant, owing to a recent decision of a special general meeting, Mr. Joseph Earp was elected Treasurer for the current year.

Dr. Kenyon exhibited a negative on an Eastman "stripping film" mounted on glass. Originally the film was on paper and was exposed with the roll of which it formed a part in the roller slide. Development was effected with ferrous oxalate in the usual way. After fixing and a brief wash, the film still on its paper support, so far treated as any other paper negative, was then simply removed from the washing water in contact with a clean piece of glass a little larger than itself and was placed in a warm room and allowed to dry thoroughly. Dr. Kenyon placed the glass, with the paper and film now firmly adherent, in water about 100° temperature, and soon afterwards poured upon it water nearly boiling; in two or three minutes the paper was thoroughly loose and was removed without the least difficulty. The plate with the film still adherent was then rinsed with the hot water. The negative then only required drying, in which condition it could be used for printing lantern slides and for enlargements, or, being a reversed negative, for printing by the carbon process. Used in this way the stripping films involve no extra labour worth speaking of as compared with glass negatives, whilst the convenience of paper in the field is fully taken advantage of. If the negative be left in the state as above described there are inequalities in the free surface which will be completely filled up and a perfectly polished result obtained if the stripping process be completely carried out; this involves the superposition of a sheet of gelatine one side of which is matt and the other polished, consequently when the film is detached from the glass each side is then polished, and the result is as perfect in every respect as if taken on a glass plate. Dr. Kenyon exhibited films in both conditions, and the demonstration, which was perfectly successful, excited considerable interest.

Mr. Mayne exhibited Sands & Hunter's book for holding dry plates, also Mason's trough for use as an alum bath.

The new PRESIDENT, Mr. Rutter, made a few introductory remarks upon taking office, postponing, however, any formal address until next meeting, as a long and interesting paper by Mr. Beer was expected to fill up all the remaining time.

Mr. A. W. BEER then read his paper, entitled *A Holiday in the North Riding*, which was illustrated by nearly one hundred lantern slides. Commencing with Whithy, with its ancient houses, magnificent abbey, ruins, and remains of former prosperity, Mr. Beer gave a vivid description of the quaintness and artistic beauty of the secluded villages in the neighbourhood, such as Runswick, Staithes, and Robin Hood's Bay, the very names of which are scarcely known, and yet which abound with picturesque subjects. He then

took his audience through the Vale of Pickering to Helmsley, thence to Rievaulx, with its fine abbey, Byland, Coxwold, and finally to Durlam, both his description and illustrations being attentively followed by an interested audience. The lantern slides, a few of which had been furnished by Mr. Boothroyd, were of a high class, and the lantern was efficiently operated by Mr. Phillips.

A few miscellaneous slides, the work of the members, were exhibited, and the meeting closed at a late hour with enthusiastic votes of thanks to Messrs. Beer and Kenyon.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

AT the meeting held at Myddelton Hall, Islington, Tuesday, February 1, Mr. J. Traill Taylor, President, in the chair.

Mr. A. Mackie showed an unexposed gelatine plate made by him early in 1876; he also showed a negative taken on a similar plate about the same date. The plate was, according to modern ideas, far too thinly coated, yet the negative was of ample density.

Then Mr. Healy showed results produced from a Wratten & Wainwright's gelatine plate made in 1878 but exposed and developed in 1886. The plate had deteriorated but slightly, an iridescent stain which extended to a depth of about half an inch from the margin being the only fault.

The PRESIDENT observed that the subject of the deterioration of gelatine plates by keeping was one which might with advantage be brought specially before their notice on another occasion. It was well known that by various reagents the nature of the silver salt in a sensitive film could be changed. By treating a developed image with bichromate of potash and hydrochloric acid the deposited silver would be converted into chloride, and so in other directions. He inquired if any one present had made a systematic attempt to restore to something akin to their original quality plates which had become deteriorated by keeping.

Mr. F. W. HART said that he had successfully treated negatives showing this defect by immersing them in chlorine water, thereby converting all the silver compounds in the negative to chloride of silver; after this treatment the plate was exposed to light and then redeveloped with ferrous-oxalate developer. With regard to treating unexposed plates for this complaint, he thought the application of bromine water would probably prove a remedy, as the sulphur compounds of silver, to the formation of which this phenomenon was due, would be converted back into bromide of silver.

The PRESIDENT thought the subject would form a good one for discussion at a future meeting.

Mr. MACKIE having passed round two negatives which showed bands of insensitiveness, due, he explained, to the plates having been kept for some time in the slides before use, and the material of which the hinges were formed having had some chemical action, several members related similar experiences, while others instanced cases in which plates had been kept in the slides for long periods without harm.

Mr. HART spoke of a case where the hinges of the dark slide had caused the opposite result. In this case the developed negative showed a reduction of the silver.

Mr. COX showed a negative in which one of the upper corners was thinner than the other portion. He could not account for this, as there was a clearly-marked boundary which ran in a diagonal direction. It was suggested that the plates had been packed with a sheet of paper between each pair, and that in this case the corner of the paper had become folded back.

A discussion then took place on the action of the contact of writing and of printing inks on sensitive plates, in which Messrs. E. Clifton, G. Smith, and others took part.

Mr. Reader passed round some of Tylar's metal dark slides. These were of less bulk than wooden ones, but were considerably heavier.

The PRESIDENT announced that at the next meeting Mr. Coventon would show some examples of the work of the late Mr. Henry Cooper, a well-known member of the original North London Association.

The next meeting of the Society will be held on Tuesday, February 15. The President will give an address on *The Lenses in Everyday Use*. Visitors are invited.

Correspondence.

THE CAMERA CLUB CONFERENCE.

To the EDITORS,

GENTLEMEN,—Will you allow me to make known through the JOURNAL the following details in connection with the Photographic Conference organized for Tuesday next, the 8th of February, under the auspices of the Camera Club?

The Conference will be held in the Hall of the Society of Arts, John-street, Adelphi, by permission of the Council, and the proceedings will be opened at 11 a.m. by the President of the Club, Captain W. de W. Abney.

The communications to the meeting will be as follows, and in the following order:—

From 11 a.m. to 1 p.m.:—

1. On Studies. W. Adeock.

2. Testing Sensitiveness of Plates. W. K. Burton.

3. Certain Features in connection with Enlarging. J. Traill Taylor.

From 1 to 3 p.m. there will be an adjournment to inspect the exhibition of apparatus and of members' pictures at the rooms of the Club.

The Conference will be resumed at 3 p.m. and continued till 5 p.m. for the reading of the following papers:—

4. The Sulphuration of Platinotype Prints. H. H. O'Farrell.

5. Isochromatic Photography. W. H. Hyslop.

6. (Subject not yet announced). Captain W. de W. Abney.

7. Rational Development. A. Pringle.

All interested in the subjects to be dealt with at the Conference are invited to attend by introduction of a member or by card. Formal tickets of invitation can be obtained on application to the undersigned.

In the evening at 8 p.m. the first Annual Dinner for members and friends will be held at the Holborn Restaurant.

At the same hour on the previous evening, Monday, 7th February, a special smoking concert will be given at the Club, and on the Thursday, 10th February, the evening meeting will be devoted to an explanation and discussion of the apparatus on show in the rooms.—I am, yours, &c.,

G. DAVISON, Hon. Secretary.

Camera Club, 21, Bedford-street, W.C., February 1, 1887.

CYANINE IN ORTHOCHROMY.

To the Editors.

GENTLEMEN,—I find from the report in your JOURNAL of last week, that it was asked at the meeting of the Photographic Society of Great Britain if any one had used cyanine for colouring plates for the orthochromatic process? Cyanine is used by Dr. Vogel in his patented process, and forms with chinoline the chief ingredient of the colour sensitiser of the "Dizaline" plates.—I am, yours, &c.,

J. R. GORZ.

19, Buckingham-street, Strand, W.C., February 1, 1887.

YELLOW STAINS ON NEGATIVES.

To the Editors.

GENTLEMEN,—In the "Answers to Correspondents" column of your issue of 21st January, is a statement from "Geo. Smith" of his unsuccessful efforts to remove yellow stain from negatives which, he says, "if the stain were removed would give good prints," and you suggest that "perhaps some reader can assist."

For removal of the stain I can suggest nothing, as my own experiments in that line were, more or less, failures; but this I can state, with absolute confidence, as the result of my own experience, namely, that after trials of the various leading developers, with and without sulphite, I was reluctantly forced to the conclusion that the development without sulphite—giving a clear yellow stain to the negative—results in "the perfection of printing," as was said by a strong advocate of soda a few years ago. I say "reluctantly" because, without doubt, the developer without sulphite is much more finger soiling, and therefore disagreeable in manipulation.

If an amateur wishes only to make the prettiest negatives, by all means let him use the developer which will give the blue-black, or the blue-grey tones; but if he works for strong prints, and, above all, for the richest tone, which in my opinion is that which I will call purple-black—but tone, I am aware, is a matter of taste—he will not be too shy of the "greenery-yallery" stain in his negative, assuming it to be good in all other respects.

I enclose a few of my smaller prints, being remainders, and not the best, but taken from distinctly yellow negatives, developed with either pyro-potash or pyro-soda, or some combination of those alkalies.—I am, yours, &c.,

J. G. R.

P.S.—I have about concluded to give up the pastime, chiefly because I find it so difficult to get first-class sensitised paper. Samples almost always work (and tone) easily and well, but "bulk" subsequently ordered is very prone to disappoint.

A USEFUL HINT.

To the Editors.

GENTLEMEN,—Will you kindly allow me, through the medium of your valuable JOURNAL, to bring before the notice of photographers generally, and especially those engaged in platinotype printing, the fact that very many faulty prints in platinum with feeble shadows and discoloured whites may be avoided by using one of Mr. Fletcher's new brass burners? In common with many others, who for years past have been accustomed to use the atmospheric stoves made of iron in the chemical laboratory, I have often been troubled with the quantity of rust formed, and the constant care and watchfulness needed to prevent error and mishap in the results arrived at, through small particles of rust—that are constantly falling off the burner on to the bench, &c.—becoming attached to the fingers or other pieces of apparatus, and thus unknowingly carried into the solutions in use. So important is it that no particle of iron should come in contact with the oxalate developer, that the Platinotype Company caution one against using the enamelled iron developing dish after the enamel has once cracked. Having recently taken up with platinotype printing, this fruitful source of failure induced me to write to Mr. Fletcher to ask him if he would assist platinum printers by casting some stoves in brass. This he consented to do, and the stove I have received from him, "No. 16 Star," answers the purpose admirably. So perfectly is the heat under control, that you can keep any quantity of solution—from one quart to one and a quarter gallons—at any constant desired temperature. Having experienced myself the comfort and cleanliness in using such a burner, always clean, and free at all times from rust, I thought I would make known to your readers that such could be procured.—I am, yours, &c.,

JOHN DAVIES.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

To the Editors.

GENTLEMEN,—Mr. W. S. Bird's attack on me in THE BRITISH JOURNAL OF PHOTOGRAPHY of this week is sharp, but, I think, not ill-natured, and it is signed by an office-bearer of the Society. The first part of his criticism is, I venture to say, conducted on a line entirely wrong. My personality—whether I am a "Sir Oracle" or not—is a matter that has no bearing on the question whatever. The point is not whether I am a conceited fool, but whether the Society is or is not conducted as it ought to be. Mr. Bird, as a private individual, is of opinion that the Society is all we can desire. I hold a different opinion, and I suppose I am at liberty to "ope my mouth." A good many other people are of my opinion if the truth were known, though only a few have expressed their sentiments as I have done—a fact easy to understand when we see how I am attacked. This reticence on the part of other persons places me in a very difficult and delicate position; I dare not even hint at the names of persons in high positions in the Society who are entirely with me in heart, though it does not suit them to join me in public.

Mr. Bird is rather unfair when he confronts me with one particular jury—that of last year. As soon as I saw the list of jurors chosen I said that a better jury could not be found. Mr. Bird quotes me correctly—"the juries"—and straightway proceeds to name the jury for 1886. This seems to me somewhat arbitrary. I hope that the jury of 1886 were all perfectly satisfied with the awards; I hope that the awards were made with tolerable unanimity. In my year the numbers allotted to certain pictures varied from 9 to 0. I do not call that unanimity, nor even tolerable unanimity. One juror or two can, by the present system of voting, take away from a picture all chance of an award, however high the votes of other jurors may be; and I have known this done on a simple matter of *dogma* regarding the style of mounting.

Mr. Bird's summing up of what he calls my "opinion" is not justified by what I wrote. I never said the Society ought to "conduct an Exhibition in London only to exalt the work of its own members." What I suggested was, that members should have the first claim to a limited area of good wall space. A very different affair from Mr. Bird's rendering of my words.

Mr. Bird states, what may be true enough, that pictures on gelatino-bromide are sent in by the score that have no just claim to be hung. There is another view of the case that may be taken. "Carbon enlargements" are produced with excellence by very few firms, perhaps, I may say, by two firms only, yet we have over twenty large frames in one Exhibition by one firm alone. This may be very representative of a firm, and highly flattering to that firm, but it cannot be called representative of the progress of photography, which, after all, is supposed to be one of the uses of our Exhibition. "Sir Oracle" would most cringingly dare, "with bated breath and whispering humbleness," to suggest that we may have too much of a good thing.

Mr. Bird appears to "lay the flattering unction to his soul" that the country members are all thoroughly satisfied with the working of the Society. I greatly fear he is mistaken.—I am, yours, &c.,

ANDREW PRINGLE.

To the Editors.

GENTLEMEN,—I have to thank Mr. W. S. Bird for the expression of his good opinion of me, which I trust I shall continue to deserve. In replying to his letter, and in an endeavour to be brief, I will not attempt to deal with all his arguments and statements, though I regret that this opportunity is not afforded me. In the first place, where does Mr. Bird find in my letter that I express any dissatisfaction at the average attendance at the Council meetings? I complained that certain members, in their third year of office, utterly neglected their duties, admitting, at the same time, that this might have occurred through no fault of their own. I found a further excuse for these gentlemen in the fact that their being placed in this position might be the consequence of the operation of an absurd rule which saddled them with a responsibility which was unnecessarily made to last for three years. Mr. Bird accuses me of not having advanced any arguments against this rule. I advanced two very cogent ones; firstly, its unfairness to the members of Council themselves, and secondly, that it prevented that healthy interest which would attach to a general election, with the results which I went on to show; but this, the most important part of my letter, Mr. Bird does not seriously attempt to tackle. On the other side, what has Mr. Bird to say? He brings forward the one possible argument, that the retirement of one-third only of the Council maintains continuity of management, &c. This I expected, and was prepared to reply to, but I am saved the necessity, for Mr. Bird devotes the rest of his paragraph to demonstrating, with irresistible logic and force, the absolute impossibility of forming a Council which does not contain a large proportion, at least, of the present names. So certain is he that, under any circumstances, this "continuity of management" would be preserved, that he challenges me to *prove the contrary*. It is by using inconsequent arguments and raising feeble objections such as Mr. Bird's when wholesome reforms are suggested, that *thinking* people are impressed with a "sense of fatuous obstinacy indulged in at headquarters." The paragraph, as a whole, is unworthy of Mr. Bird's well known ability; to use his own words again, there is "sound only in it, not sense."

Passing over Mr. Bird's next paragraph with the remark that the theory is pretty, but it is theory only, I come to the subject of the meetings, and here, I am happy to find, we are substantially agreed. Mr. Bird is, however, misinformed upon one point. New subjects are rarely started at Pall Mall, but have usually been "sufficiently discussed" at other Societies before they drift there. I am said to be wanting fuller information. I am, at any rate, possessed of one piece of information which fills me with sorrow, and which Mr. Bird and his colleagues would do well to verify, and then to deliberate upon. It is that the Society, its doings and its journal, are rarely spoken of outside its own doors except with undisguised contempt.—I am, yours, &c., A COUNTRY MEMBER.

January 31, 1887.

[The whole matter connected with the Society having now been thoroughly ventilated, we here close the discussion.—Eds.]

Answers to Correspondents.

- JOS. MILLER.**—Dilute ordinary gas tars with benzole.
MEDIUM.—Try Canada balsam thinned with turpentine.
H. B. WALLASTON.—With you we agree that enough has been said on the subject. From an append to one of the letters you will see the matter is now closed.
J. E. GOWER asks if dextrine is a reliable mountant.—We have had very little experience with dextrine as a photographic mountant, as we ourselves much prefer starch for the purpose.
R. PURMAN.—The markings on the collodion transfers are due to their being made on dirty glass. Gelatino-bromide paper is quite as easy, indeed easier, to work than collodion transfers, while the results are, as a rule, far superior.
PRESS.—We know nothing of the press mentioned. For collotype printing in this country ordinary typographic or lithographic presses are usually employed. If the former, they must be of the best make, otherwise there will be a danger of the glass plates being broken by unequal pressure.
S. W. asks how two prints from a quarter-plate negative can be mounted so that they look stereoscopic in the stereoscope?—There is no method of mounting two prints from the same negative so that they show stereoscopically. We refer our correspondent to the articles on the stereoscope in the ALMANAC; he will there see the reason why.
ADA.—Take the advice given you, and do not expend any money, however small a sum, to be taught that system of colouring with a view to earning a livelihood. No photographer would ever give you employment, notwithstanding the plausible tale you have been told. If you wish to become a photographic colourist you must learn to colour in an artistic manner.
A. B. Z inquires how "chromotypes" which are mounted as enamelled prints are to be spotted, as they, he says, must be spotted after they are removed from the glass.—Chromotypes with the enamel surface cannot be spotted after they are taken off the glass. They must be done while they are still on the plate and before the transfer paper is applied; that is, spotted on the back of the carbon image. This should be done with oil colour—that sold in tubes by the artist colourmen—thinned with turpentine.
H. STANTON says: "I have recently purchased a portrait lens by Shepherd at a sale, and upon trying it I could not get anything like sharpness. On taking it to pieces I find that it has only one back lens—a double convex; ought it not to have two? Pardon my ignorance, as I am only a beginner."—The lens is incomplete, as one of the components of the back combination is missing. If our correspondent discards the back lens altogether and screws the front one in its place he will then have a very useful single lens if it is stopped down to about one-fifteenth or one-twentieth of its focal length.
A. G. CLEMENTS.—1. If the enlargements are well made they will be nearly or quite as good as if the pictures were taken direct.—2. A whole-plate lens of the rapid type you would find very useful.—3. On the whole, perhaps, you would find a shutter working either in front or between the lenses more convenient than one working at the back for instantaneous exposures. If you adopt a drop shutter, that figured in the diagram will give the more equal illumination all over the plate.—4. Your failure in producing distance was not due to the form of lens used but probably to the state of the atmosphere or some other cause.
A. E. FOX asks: "What are the best materials for making a mixture suitable for producing a powerful artificial light for photographic purposes? Some years since I think you published a formula for such a compound in one of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANACS, but I cannot find it. Can you kindly tell me where the mixture can be had ready for use?"—Any of the usual white fires employed in pyrotechny will answer. Here is a good formula:—Charcoal, two parts; sulphur, twenty-two; nitre, seventy-six. Another is, Nitre, sixty parts; sulphur, twenty; black antimony, ten; meal powder, six; powdered camphor, four. The composition may be purchased ready for use from any of the firework manufacturers.
C. RICHARDS says: "Will you kindly inform me how methylated spirit, which has been used for precipitating gelatine emulsion (ammonia process) can be purified to render it perfectly safe to use again for precipitating. My idea would be to filter to remove insoluble matter, then add, say, four ounces carbonate of potash to get rid of some surplus water as well as some of the salts soluble in the spirit, and afterwards distilling. Would the spirit after this treatment be as pure as it was before it was used? I find that even after the addition of potash carbonate the spirit retains a large quantity of, probably, nitrate of ammonia, clogging the wick of a spirit lamp in a very short time."—In reply: If the spirit be distilled as proposed, it will be ready for use again. A small proportion of ammonia may possibly come over, but it will do no harm.

NEMO.—1. See article on the subject of pedestal portraits, by Mr. W. M. Ashman, on page 100 of the ALMANAC.—2. There must, we surmise, be something unsuitable in the colours you employ. Procure fresh colours from another source.

THE LIVERPOOL UNPLEASANTNESS.—We have received a large mass of correspondence relative to the unfortunate cloud which has seemingly been damping the geniality that usually prevails among the members of the Liverpool Amateur Photographic Association. The correspondence arises out of the publication of a report of proceedings which—the Secretary being, as we understood, absent on the Continent—was furnished to us by a member with whose name we had long been familiar. Some members say the report is quite accurate, others aver the contrary. To publish the whole correspondence would necessitate our issuing a four-page supplement. We, therefore, must confine ourselves to a very brief synopsis, and in this take cognisance of only three letters. Mr. John H. Day says that the report in question was as untruthful as it was unofficial. The letter of Mr. Ellerbeck, he says, written apparently while he felt excited, really, although doubtless unintentionally, stated the facts incorrectly. The alleged grievances of which Mr. Ellerbeck complains have no real existence, at any rate not to the extent imagined by that gentleman. Mr. Adolph W. Beer replies to the statements of Mr. Ellerbeck *seriatim*. He says that the resignation of Mr. Ellerbeck, offered three years ago under very dissimilar circumstances from those which now obtain, the Council did not see any necessity then to accept; *they did not*, nor could they, bind their successors in any way whatever. "But the point," says Mr. Beer, "that affects me personally, and has been, by the evident intention of the writer, given the prominence of a foot-note, I must ask your indulgence to go into more fully. At the Council meeting of the London and Provincial Photographic Association, held preparatory to the General Meeting in November last, Mr. Ellerbeck laid down the astounding dictum that membership in another Society was a sort of disqualification for office in this! Mr. Ellerbeck knows perfectly well, but is not sufficiently candid to mention it, that he himself had as much to do with founding the bright, lively, sociable, little Society at Birkenhead, as I had—we being both present at the inaugural meeting and promising it support—and, as a matter of fact, Mr. Ellerbeck was a member until the first day of January, 1887. Some of us are sufficiently ardent amateur photographers to desire more opportunity for meeting than one and a half hours once a month, and with the two Societies we have the grand total of two one and a half hours, or three hours *per month* for photographic intercourse." Mr. Beer concludes: "Finally, no charge of the nature mentioned by Mr. Ellerbeck was ever brought against him by any one. The fact is, as is well known to every member of the Council, the whole of the circumstances leading up to this affair cannot be discussed in the columns of a public journal." Mr. Ellerbeck reasserts his former position, and enforces it in some detail. In the course of his letter, he says Mr. Atkins insinuates that he (Mr. Ellerbeck) sent us the report of the meeting of the 9th December. From a reperusal of Mr. Atkins' communication we do not think this can be deduced; at any rate, it is *not* the case—our source of supply was different. Referring to Mr. Atkins' statement that no charges have been brought against him in our JOURNAL, he says that the charges were made behind his back. We are bound to say, and we do it with pleasure, that a very kindly feeling towards Mr. Ellerbeck has been expressed throughout all the numerous letters concerning this matter which we have received from Liverpool, and all join in expressing their sense of the service he has rendered photography there. Would it not now be well that the hatchet should be buried, and the pipe of peace be smoked? Before closing, we might throw out to our Liverpool friends a query as to whether it would not be better to do as the late North London Amateur Society, namely, throw the Society open to professionals as well as amateurs.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, February 9, 1887, will be on *The Artistic Treatment of Photographs*. Mr. Norman Macbeth, R.A., will demonstrate.

A CERTAIN photographer, not a thousand miles from Market Rasen, begs (we quote from his circular) "to inform the public that he has removed from where he did live, *but not from where he lives now.*" We should think not.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The annual meeting of this Society will take place of Tuesday next, February 8, at eight p.m., at the Gallery, 5a, Pall Mall East, when the Report of the Council will be read, the financial statement made, and the election of officers take place, after which Mr. J. B. Spurge will read a paper on *A Method of Estimating Photographic Deposits, with Reference to the Printing Quality of Negatives.*

PHOTOGRAPHY IN COLOURS ONCE MORE.—The heathen Chinese has got ahead of the Western barbarian in a department of science which he had thought peculiarly his own. An American paper announces that a Chinese gentleman has discovered the secret of photography in natural colours—the realisation of the dreams of all our photographers from Daguerre's day down to our own. The inventor's name is a caution to the registrar of patents, and deserves to be set to music. It is Azurizawa Ryochi Niehomo Sanjukanboz Kiobashi-ku. It is to be hoped that the process is a trifle simpler than the name of the discoverer. He is exhibiting the picture of the island of Enosbima, with the sand, sky, cliffs, trees, and native houses, all in their exact colours, and the effect is said to be singularly beautiful and surprising.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1397. VOL. XXXIV.—FEBRUARY 11, 1887.

COAL-TAR COLOURS IN PHOTOGRAPHY.

WE have, in our former article upon this subject, spoken in a general way of the wonderful series of colours obtained by treating in various manners some of the products of coal tar, so that we may now more particularly refer to the colour, or class of colours, at present exciting so much photographic interest—the eosines. The basis of all the colours embraced by this term is fluorescëin, a substance exhibiting when dissolved the property of fluorescence in the highest degree. This latter body again is obtained from phthalic acid and resorcin, so that the subject we are now treating of may be classed as either a benzene or a naphthalene derivative, or even a phenol, as resorcin may be termed a phenol. Thus much by way of classification as described in our former article.

Fluorescëin, then, is made by heating together phthalic anhydride and resorcin, the product being the substance in question in a crude state, but from which the various eosines may be prepared. In the pure form it is a deep orange crystalline powder, only slightly soluble in cold water, but easily so when a little caustic alkali is added. It then forms a liquid which is of a deep yellow colour when observed by transmitted light, but which appears a beautiful light green by reflected light, a green of such intensity that the liquid looks almost as though some opaque pigment were contained in the bottle. So intense is this curious effect that a single grain weight of fluorescëin is capable of rendering fluorescent thirty gallons of water.

The eosines come into trade in many forms and under many names, but all are fluorescëin compounds of one sort or another—nitro or halogen derivatives. They are various shades of red, and are described as blue shade, yellow shade, &c., or else have special trade names given to them. Most of them exhibit an intense fluorescence when dissolved, and usually in the highest degree when the solvent is alcohol. Tetrabromfluorescëin has often been named of late in the discussions upon orthochromatic plates, and its alkaline salts form eosines, which in the market are termed eosine J, eosine yellow shade, or soluble eosine. They are very readily soluble in water, but only slightly in anhydrous alcohol. Tetrabromfluorescëin itself is a fairly strong acid, and combines with metallic oxides, silver for example, so that the compound thrown down from this eosine by nitrate of silver is a true silver salt of definite and known composition.

When for the bromine of this compound iodine is substituted, we have tetraiodfluorescëin, the alkaline salts of which have a bluer shade, and are known under many names—eosine B, pyrosin B, soluble primrose, &c. The salt recently alluded to by Mr. Wellington under the name of erythrosine is

an alkaline salt of tetraiodfluorescëin. The aqueous solutions of the base do not exhibit any fluorescence. We also have aureosin J, eosine B N or safrosin, lutécienne, rubeosin, in which chlorine or nitric acid take part in producing a change in the complex body.

We next come to the variety of eosines known as “spirit-soluble” eosines. They are obtained from the ethers of fluorescëin, and their potassium salts are sold as eosine soluble in spirit, ethyl eosine, methyl eosine, spirit primrose, &c. As their names imply, they are soluble in spirit, though only when containing a certain amount of water, as in anhydrous spirit they are insoluble, and but slightly soluble in water. Their fluorescence is very marked. We have also rose Bengale, phloxine, cyanosine—all eosines.

These spirit-soluble eosines have the brightest tints, but they are the most expensive to purchase, and in consequence are little used for dyeing purposes. Whether they are not better for orthochromatic plate production is a question, seeing that their fluorescence is greater in spiritous than in aqueous solution. We may here mention as a kind of warning that many coal-tar colours sold under particular names, and possessing fluorescent properties in solution, must not be lightly assumed to be compounds of a nature different from the eosines, and so able to be used if the existence of a patent rendered the use of eosine illegal, for there are many compounds known in trade under fancy names which are merely admixtures of one or another of the eosines with some other colour.

It may be interesting to note a few of the prominent reactions of the eosines, the striking nature of some of them rendering the detection of these compounds in solution not very difficult.

First, of course, comes their fluorescence, which is strongest when they are dissolved in spirit, brightest when the “spirit-soluble” preparations are used; but it must be remembered that the eosine B does not fluoresce at all when dissolved in water, and does so but little when in spirit.

Hydrochloric acid throws down a fluorescëin in a free state, and in various colours, according to the salt decomposed. Nitrate of silver and other metallic salts throw down coloured precipitates, and bleaching powder decolourises the solutions. The particular eosine acted upon may often be found by noting the colour effect produced by adding ammonia to the product of solutions decomposed by boiling with ammonia and zinc powder, and the precipitate dissolved in hydrochloric acid.

To test for eosine, the substance dyed with it is treated with warm water and a little ammonia, which will usually remove some of the colouring matter. Alcohol may also be

used, in case a spirit-soluble eosine had been used. The treatment of this aqueous extract, so to speak, with a strong solution of potash gives, according to the eosine employed, various colours, mostly of a red hue in the cold, changing to bluer or olive-green shades upon boiling. Spirit-soluble eosines are insoluble in cold strong solution of potash, but change in boiling from orange-red through violet to blue. Hydrochloric acid or acidulated chloride of tin decolourise or turn the eosine yellow.

In a short article like this we cannot pretend to give more than the briefest outline of the properties and production of these interesting bodies, but our purpose will have been answered in showing what eosines are and in indicating their sources, and, finally, in pointing out what a very wide field is covered by the term eosine. It is no part of our purpose here to dissect the patent under which is claimed the sole right to use the eosines with gelatine plates; we can only trust that no clauses it contains will be operative in stifling experiments or placing obstacles in the way of progress in a direction in which there have already been obtained such marvellous results.

THE CAMERA CLUB CONFERENCE.

THE Conference which was held at the Society of Arts on Tuesday may be looked upon as having been a decided success.

The morning meeting lasted from eleven to one, and that of the afternoon from three till after five o'clock. The attendance at both *séances* was all that could have been desired. Captain Abney presided on both occasions.

In the morning, papers were read by Messrs. W. Adcock (*On Studies*), W. K. Burton (*On Testing the Sensitiveness of Plates*), and J. Traill Taylor (*On Amateur Enlarging on a Small Scale*). Those in the afternoon were *The Sulphuration of Platinotype Prints*, by H. H. O'Farrell; *Orthochromatic Photography*, by W. Hyslop; a paper on the same subject by Captain Abney; and *Rational Development*, by A. Pringle. Discussions followed the reading of each paper. The attendance was not confined to members of the Club, as there were several amateur and professional photographers unconnected with it present throughout the entire proceedings.

Meetings of this nature cannot fail of being attended with beneficial results, and we echo the hope expressed by the Chairman, that the Conference which would be held about the same time next year would be even still more successful. The papers read will, with one exception, be found on another page.

THE method of transferring negatives, taken on paper, to films, recently introduced by the Eastman Company, and described in our last issue, promises to prove very useful in the production of reversed, or inverted, negatives for collotype and other photo-mechanical processes, where a reversed image is an essential, also for single transfer carbon printing. Of course all paper and film negatives may be printed from either side, but when the printing is conducted through the support, whatever it may be, there will always be to a certain degree a loss of sharpness. It need not be much, it is true, if direct light be used, yet still there is some, and, what is more, if the medium which supports the image contains any granularity, the grain must, more or less, be manifest in the resulting impression. Here is how the new process may be utilised. Instead of treating the glass with French chalk, as described last week, it is simply cleaned, and afterwards coated with the collodion. Then, when the image is transferred, all that is necessary is to dry and varnish it, and the thing is complete. By this means we obtain a reversed negative on glass, which, as a

matter of course, will print quite as sharp as if it were taken direct upon it in the first instance, while it will be perfectly free from granularity.

COLLOTYPE printing appears to be coming more and more to the front in this country, though, it must be confessed, it is as yet not nearly so extensively worked here as on the Continent—Germany, for instance. Still, there has been a great increase during the past year or two in the numbers employing the process commercially. Collotype printing by machinery is now being practised by more than one firm in the Metropolis, and we are informed it is to be shortly introduced in the provinces, and very good work is being produced by this method of obtaining the impressions. It is generally admitted that, at the present time, machine printed collotypes are, in some respects, inferior to those produced by the most skilful workers with the hand press. When lithographic machines were first introduced it may be remembered that the same remark applied to them, but as we all know, some of the finest lithographic printing is now being executed by machinery.

PROBABLY improvements will be made in collotype machines which will, eventually, remove the reproach that now applies to them, the same as in the case of lithography. Unfortunately collotype, like lithographic machines, are somewhat expensive things, and this will doubtless prohibit their general adoption except in large establishments. A machine of medium size costs several hundreds of pounds. At present the manufacture of collotype machines (*Schnellpressen*) is confined, we understand, entirely to Germany, but there is little doubt, if a demand arises for them, but that they will eventually be forthcoming from English printing machine manufactories. In construction these machines do not differ materially from lithographic ones; indeed, the latter may be really converted into the former with a little ingenuity.

DURING last week there were several panics on the Stock Exchange, and many-excited groups of brokers and jobbers were to be seen, all day long, in the neighbourhood of Throgmorton-street. Favoured by the bright weather, some very characteristic pictures, representing the commercial phases of City life, might easily have been secured with instantaneous exposures. During a commercial crisis excellent studies of character may often be obtained in the neighbourhood of the Exchange, or on the Liverpool flags. The Stock Exchange has always possessed, amongst its members, a large number of amateur photographers, but we can readily imagine that on occasions such as the above they are too much engrossed in their immediate business to give a thought to their favourite pastime, or the interesting pictures that they might obtain. Nevertheless the circumstance is worth mentioning.

Two or three cases under the Trade Marks Acts, of interest to those who supply photographic requirements and wish to distinguish their specialities by some particular or conspicuous title, has recently been decided in one of our law courts. From the reports it appears that an immense number of applications have been made to register the word "Jubilee," as applied to various manufactures, as a trade mark, one of these being a particular make of note paper. An action was instituted by one firm, who had registered the word, against another firm to restrain them from using the same term. The action was resisted on the ground that Jubilee was not a "fancy word" within the meaning of the Trade Marks Acts, and, in the result, the judge ruled that it was not. A similar decision was given a few days previously, in the case of the word "Electric," as applied to a fabric. We believe that any word, fancy or otherwise, may be registered as a trade mark, provided it be inserted in, or is accompanied by, some special or distinctive device. But then it can only be registered as a whole, and any one will still be at liberty to use the word by itself. This fact should be borne in mind by those who are seeking for distinctive names for their wares, whether they be instantaneous shutters, dry plates, or some modified process of producing pictures.

FROM a remark made by Captain Abney at the Conference on Tuesday, it is evident that he does not attach *very* great importance

to the value of isochromatic plates as applied to ordinary landscape purposes. If we understood him aright, he believes that their real use will lie in the copying of paintings. But, it may be queried, are not paintings transcripts of nature, not only as regards drawing, but also colour?

In a speech made at the last meeting of the London and Provincial Photographic Association, when platinum printing was very ably demonstrated by Mr. F. M. Edwards, who is a master of that special art, Mr. Willis very clearly showed the difference between the fading of a picture and the discolouration of the paper or other substance upon which that picture was impressed, a distinction sometimes apt to be lost sight of, as was the case several years ago, when the subject of the alleged fading of carbon prints was prominently brought before the public in these pages. The fact, however, was clearly shown then that whereas a certain sample of paper then in use was liable to, and did, become discoloured, the image itself remained unaltered. This has a bearing on the discussion on platinotype that has for some time been going on. The image itself, and the basis on which it is supported, are two different things.

ON THINGS IN GENERAL.

PRINGLE and Platinotype make such a pretty alliteration that I feel inclined to start at once upon a subject which, still holding the field as it does, is exciting a lively interest at the present time, and as the gentleman named is such a lively writer I feel sure we shall all be kept awake the next few weeks. Whether with the most engaging candour he was not, in his now celebrated article, taking quiet "pot-shots" at the integrity of the process I will not attempt to determine; but I do say that I look upon his contribution as an especially valuable one. He has shown that there is something in the whites of the platinum prints he examined that can be yellowed by sulphuretted hydrogen: *ergo*, let it be discovered what that something is, and how to prevent its presence, for it is obvious that if it make its appearance in one man's prints it may also do so in another's. The poor albumenised paper print decidedly goes to the wall in the discussion; but it still holds its own with the public, and is likely to do, I imagine, at least in the case of small work, for none of its rivals can there surpass it, and as to permanency, the permanency of a properly executed print on silvered albumenised paper is simply a question of keeping. Any photographer of experience knows where to lay his hand upon dozens of prints, twenty or thirty years old, as good as in the day they were produced. It is all very well to talk about the sulphuretted hydrogen in the atmosphere—we know it is there in plenty; but I am making a great mistake if it be not sulphuric acid that we are to look to for an explanation of faded albumenised prints.

What negatives one used to produce when dry plates and re-touching were not! Mr. F. M. Edwards strikes a chord which will cause a sympathetic vibration in the bosom of many an old stager, when he says, as he did at the meeting of the London and Provincial Photographic Association, "the negatives turned out nowadays were not worth calling negatives at all." Bravo, Mr. F. M. E., for speaking out your mind! I think a great many more will echo your sentiments in a few years time, when albumenised prints from these negatives, so dim and poor to the eye, shall have run their course, and shown how albumenised prints can be produced so as almost to be warranted to fade.

The meeting for the month, however, which for exciting interest must carry off the palm, was the Parent Society's, on the twenty-fifth ultimo. It was rather hard lines for Mr. Dixon, after having worked up a process for making a successful orthochromatic plate, to feel that his labour was thrown away. His throwing up the sponge as he then did was to my mind absolutely pathetic. But he acted as a wise man. If he were to fight the patent and win it would only be for others as well as himself. After he had borne all the expense others would step in and reap the profit. This, too, assuming he did win. I have in my journeying about the world met confiding individuals who are under the impression that when a man wins a lawsuit the other side pays all the costs. What would I not give for such trusting faith! One of the most costly of modern patent trials connected with chemistry was in connection with the very subject of

the coal-tar dyes, and solely turned on the meaning of the word "dry." By-the-by, let me suggest to Messieurs the Editors that they give a reprint of the celebrated eosine and gelatino-bromide patent; it would at the present time be of great interest. Looking at the various discussions upon this wonderful eosine subject, it seems to me to be generally assumed that the eosines are all fluorescent. Such is not the case, whatever bearing the fact may have on the matter.

I was pleased to see an article from the pen of Mr. Lewis Wright illuminating these pages, for whatever he writes is always to the point, and, what is more, thoroughly practical. Some of his experience in optical and lantern matters, if placed at the disposal of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, will be a valuable addition to the ever increasing usefulness of its pages. It will be long before oxygen is displaced for optical lantern work for large exhibition rooms, though, with Mr. G. Smith, I must confess to a partiality for a good paraffine lamp as an illuminant, and the old two-wick Sciopticon takes a deal of beating. True, the bare white disc will show a faint upright bar, but it is quite invisible when a picture is thrown on the screen.

That was a good idea that was put into execution at the Birkenhead Society's lantern exhibition. The room did not allow the usual sheet being put up, so Mr. Evans provided "a piece of drawing paper about six feet by eight feet square" (whatever that may mean), "such as is used by architects, and can be bought up to any length." I have not ever come across any such paper so wide as six feet, though when mounted on cloth it can of course be made, by joining, of any width, until the limit of the linen is reached. It occurs to me that, as the lantern must have been at the same side of the screen as the audience, it (the latter) must have been an uncommonly small one. There are many varieties of screens, not often mentioned, that can be used for lanterns with great advantage. I have seen tracing cloth used with excellent effect, but the greatest width it is obtainable in is only a few inches over a yard. The other day I saw the wall of a lecture-room itself prepared for the purpose. Instead of whitewash or distemper, the last coating was of Parian cement, which gave a capital surface and could be cleaned whenever required, and thus the mess and nuisance of the painter and his myrmidons avoided.

Speaking of the projection of an image on a screen, calls to my mind an article from an American source which in the first number of this JOURNAL for the year was given a prominent position. The writer, Mr. Walmsley, says: "It is highly desirable that the rays of light, after passing through the objective, should be allowed to diverge as speedily as possible. Where they are confined to the limits of a long tube of small diameter, it will be found that only a small circle of light will be thrown on the ground-glass when the camera is closed up short, and that it must be lengthened to a considerable extent before the entire plate is illuminated." After writing a practical article, one can scarcely understand such meaningless matter as this. An ordinary microscope tube will show on the ground-glass as much as is desirable, on the grounds of definition, and the only way the entire plate is illuminated is by increasing the size of the image. It would have been more to the point if he had pointed out the usual failure of beginners with photo-micrography, and that is the ring of light, something like the old "flare spot," always produced unless the microscope tube be lined with black velvet or something subserving a similar purpose.

FREE LANCE.

NOTE ON CASTING IN PLASTER FROM PHOTOGRAPHIC CLICHÉS.

[A Communication to the Edinburgh Geological Society.]

It is sometimes desirable to convert a photograph (say of certain of the *Microzoa*) into a plaque, which can be mounted on a tablet and exhibited in a case. This can be done by taking plaster casts from reliefs in gelatine. They are producible in two ways. 1. On the commercial dry plate; 2. On *clichés* of bichromated gelatine.

1. On the commercial dry plate. I have experimented with a few makes, but find the gelatine too soft in most cases. One make (possibly containing bichromate) gives tolerably good results, but different batches differ in their power of resisting the rather severe treatment to which they are subjected. The treatment is quite simple, and consists of dipping the plate (it must not be alumed) for a few moments in water, kept at a uniform heat of 90° Fabr. by an automatic gas regulator. I should think that a plate could be put on

the market suited to this particular purpose, and its utility in the various photo-mechanical printing processes would ensure a steady demand for it.

Whilst the relief is still moist and at its best, pour on No. 1 plaster, as in ordinary plaster casting, mixed with a little alum to harden it. When dry the plaster leaves the gelatine without much trouble, no lubricator being needed. The resulting cast may of course be coloured if desired.

2. On bichromated gelatine. This method is well known. It has the great advantage of being capable of giving a higher relief if required according to the thickness of the gelatine. On a moderately hard gelatine hot water may be used, a fact known almost as long as photography. A little caution must be exercised in the choice of a subject. Their microscopied sections are for obvious reasons unsuitable where strict accuracy is required; but when the lights and darks of the *clichés* (upon which intaglio and relief depend) nearly correspond to the real intaglio and relief of the object photographed, the resulting cast will of course be accurate as well as beautiful.

THOMAS STOCK.

PHOTOGRAPHIC LENSES.*

The Optical and Focal Centre.—It is in many instances desirable that one should be able to know where the optical centre of a lens is situated. It is a property of this centre that any ray, refracted by the lens, which passes through it emerges in a direction parallel to its incidence. It is from a point near to, although not quite at, the optical centre of a lens, or combination of lenses, that the focus must be measured. To find this centre, draw two parallel radial lines, one from the centre of each curvature, and both being oblique to the axis; then connect the points at which they touch the curved surface by a line, which, in the case of a meniscus, must be prolonged till it meet the axis. The point at which this junction line touches the axis is the optical centre. In class-books on optics the following rule is given: "Multiply the thickness of the lens by the radius of one surface, and divide the product by the sum of the radii, and the quotient is the distance of the centre from the vertex of that surface."

In a combination of lenses there is no fixed point which can be termed the optical centre. The mistake is frequently made of assigning it to a position near the diaphragm which has not necessarily any relation to that of the centre, which can only have its position determined upon knowing the precise circumstances under which the combination is to be used, for it has strict relation to the conjugate foci. What is commonly termed the optical centre in a combination is in reality the centre of conjugate foci, and this is determined by the conjugates, which may change with nearly every change of picture taken.

The *equivalent focus* of a lens is so termed from an image formed by it equalling in dimensions that made by a single lens. It has no relation to the misleading term "back focus" so frequently employed. It is not difficult to conceive of an objective, the back focus of which—that is, the distance between the posterior surface and the ground-glass of the camera—may be four inches, while the real or equivalent focus is eight inches. As it is of great importance that photographers know precisely the foci of their lenses, I shall describe methods by which this may be ascertained. Let me first of all observe that, although it has been taught by some that the focus must be measured from the optical centre, this is not quite correct. In every lens or combination there are two nodal points, which are centres of admission and emission. They are sometimes designated the Gauss points, from the fact of Gauss having communicated an investigation of their properties to the Royal Society of Göttingen in 1840. In the case of a simple biconvex lens these points are situated between the optical centre and the surface, while in a meniscus lens it is outside of the lens and a little within the optical centre. It is the back nodal point which concerns us at present, as that is the one from which the focus is measured. In a rectilinear combination this posterior focal centre is situated between the diaphragm and the back lens. Opticians interested in this are referred to Secretan's treatise on the true point from which the focus should be measured, or to Gauss's memoir.

It has often been recommended to determine the true focus of a lens of this nature by focussing the camera upon an object, so that the image and the object shall be of precisely the same size, and divide the distance apart of the two by four, the quotient expressing the true equivalent focus of the lens. This is altogether misleading as applied to the combination lens in common use, the focus thus obtained being greater than the true focus by nearly one-fourth of the distance at which the lenses are separated in the mount.

Out of several methods by which the equivalent focus may be

* Continued from page 73.

ascertained, I shall mention only a few. Select a very thin spectacle glass which, after trial, is found to give an image on the focussing screen of the same dimensions as that given by the photographic objective; and the distance of that glass from the focussing screen, less one-fourth its thickness, is the focus. Or, having marked upon the ground-glass the precise spots upon which two well-defined objects depict their images near the margin on opposite sides of the screen, unscrew the lenses from the mount and insert a pinhole diaphragm made in a thin metal plate. Rack the camera in or out until the images made by the pinhole correspond with that of the lens in dimensions. As before, the distance between the ground-glass and diaphragm is the focus.

The way which I prefer is Grubb's, on account of the ease with which it may be carried into operation and the accuracy of the result. On the ground-glass of the camera make two pencil marks at either side, each being a distance of an inch or so from the margin, although this is not material provided both are alike as regards distance. Having brought up a table to the window, spread upon it a sheet of paper, and upon this place the camera. Focus upon a distant scene, and rotate the camera until a well-marked object in the scene—such as a chimney or spire—is superposed on one of the lines drawn on the ground-glass. Now using the side of the camera as a ruler, draw a pencil line upon the sheet of paper upon which the camera is placed, and rotate the camera so as to superpose the same object upon the other mark on the ground-glass, and again draw a line upon the paper. Having removed the camera, for which there is no more use, continue by aid of a flat rule these two angular lines until they meet at a point, then connect them by a line as in the capital letter A, which line must equal in length the distance between the two marks made on the ground-glass, and with a foot-rule measure the junction of the angular lines to the centre of the cross line, and you have the true focus of the lens.

Schroeder's method is also simple and excellent, although it implies the possession of a camera capable of extending to about twice the focus of the lens. Extend the camera until the dimensions of the image on the ground-glass and of the object in front are alike. Having marked the position of the camera back in relation to its baseboard, slide or rack it in until a distant object is in focus, and again mark the position of the back. The distance between the two positions, or that through which the camera back was made to travel from the first focussing to the second, gives the equivalent focus of the lens. In a rectilinear symmetrical doublet of wide-angular aperture which I possess, having an equivalent focus of 13½ inches, a reputed focus of 13 inches, and a back focus of 10¾ inches, I find that the focal or posterior nodal point is situated ¾ inch back of the mechanical centre of the lens. This is a matter that greatly concerns those who have to make copies to scale, and who have the sides of their cameras graduated in order to facilitate accuracy and speed.

(To be continued.) J. TRAILL TAYLOR.

BEAUTY OF POSE, PROPORTION, AND FEATURE IN PORTRAITURE.*

AFTER the curve of the principal line has been determined—by means of the disposition of the arms, hands, &c.—it remains for the artist to decide whether he will keep his composition simple, or enrich it with a secondary line, subordinately repeating the first in some region further removed from the centre. If the design is to be enriched, then, "though to a principal group a second or third be added, and a second and third mass of light, care must be taken that these subordinate actions and lights, neither each in particular, nor all together, come into any degree of competition with the principal; they should merely make a part of that whole which would be imperfect without them." To suit my present purpose, I would read "leading lines" for "groups," and "contrasts" or "lines of position" for "lights." And, where such embellishment is undertaken, the utmost care must be observed that the minor details of the subordinate schemes do not clash with those of the first. The principal line of direction should originate not too far from the centre, sweep in a "fine" curve towards the margin of the enclosing form, and return to itself at some little distance from the point at which it commenced. The chief point of interest, as I have said before, may be situated anywhere in this line, which should never be allowed to get out of the picture, nor even to touch its margin at any point. In a full-length portrait the body and arms will form the thickest part of the line, and no secondary curve of direction must cross the first at right angles, even when comparatively subdued in emphasis of light and shade; and in this case also it must not be allowed to run parallel

* Concluded from page 54.

with the principal line. Minor lines of direction may cross and coquette with the leading line as much as they like, but in no wise must they interfere to prevent its asserting itself as the subject of the picture.

Thus we see how pose is determined by the first requirements of good composition. But, having roughly estimated the relative positions of our principal points of attraction with regard to our boundary lines, and decided as to their relative values of light and shade with regard to each other, there still remains for us finally to determine the position and aspect of the details, regulated so far by what we have already done, but which have to be modified more or less—but generally more—by the incapacities or imperfections of our subjects. This involves a partial rearrangement of almost everything; and depending, as I have said, on the individuality of our models, cannot at any length be touched upon in this paper.

Study the human figure. Avoid overcrowding and false accentuation as much as flat surfaces and empty uninteresting spaces. Mark, above all, the requisite unsymmetrical balance of the human form. See how one line of position alternates with two lines of direction, and *vice versa*. Note the excessive difficulty in ever getting two parts, which in nature are the same, to assert themselves with equal force at once. Look at the utter absence of sharp angles, of right angles, of straight lines, and of perfect circles in nature. Since the forehead surrounds the eyes, the cheeks, the nose, the jaw, the mouth, and so on, I infer that a comparatively clear expanse should be allowed near every point of interest. This expanse may indeed be without limit if the point of interest is to be looked upon as an isolated fact, and, together with the absence of angles between the subject and the bounding lines which such a treatment implies, affords the best explanation of the exceptional beauty of a picture whose subject is entirely within the canvas, and also of a vignette which imperceptibly fades into nothing. On the other hand, this expanse must be carefully limited where the subject is to be considered as a compound one, as in the case of a historical picture containing many figures, or a portrait embracing a head and two hands, where each point of interest forms a line of position having a very intimate relationship to the others, when too much consideration cannot be given to the lines of direction which bind them to each other, and determine the beauty of the curve which I have called the principal or leading line of the entire picture. For this reason it is that we insist that the dress must be intermediate in tint between the brilliance of the high lights of the face and the shadow of the background; or, as in the case of a vignette, be intermediate in contrast as compared to that of the head, for it is by such treatment alone that we can ensure a broad, swinging, leading line to the entire composition. It is for this reason, too, that we do not allow any point or line of importance to impinge upon any bounding line, and thereby to add a false quantity to the concrete design, nor permit of the exit of any leading line of direction at a right angle to any of the lines enclosing our subject, unless we cannot possibly help it, as is the case where we have a three-quarter length figure of a man standing. This it is that determines that a mountain shall not be cut off either at its base or at its summit, and which suggests that a figure is better cut off in the middle of the chest, thigh, or leg, than at the chin, waist, knee, or toe. Lastly, it is this that forbids of an akimbo elbow to just touch a bounding line, thereby to form a K, and will not allow a pronounced line of direction to bolt out of the picture exactly at a corner, and thus to suggest a series of radiating lines, V—, foreign and antagonistic to the design.

The power justly to criticise a work of art, chiefly in its broader aspects, is, I think, as rare as it is important, else the scarcity of truly beautiful compositions would be less. Generally speaking, if a picture be not absolutely faulty, the absence of beauty in the composition is entirely overlooked, and the eye allows itself to be cajoled by mere beauty of detail. A better judgment insists, however, on first of all deriving pleasure from the entire effect, as composed of a mass of flowing curves, composed of masses of light and shade, existing utterly independently of their subject-matter. From this point of view, a very beautiful picture may be formed representing nothing at all, and which one man may imagine to be meant for one thing, and another for some thing entirely different. Everything to which I have referred hitherto can only appear as perfectly beautiful as possible where this is considered.

HUGH BRENNER.

THE PHOTOGRAPHIC CONFERENCE.

As announced on another page, a Photographic Conference, instituted by the Camera Club, although open to the public, was held on Tuesday in the Large Hall of the Society of Arts. We give below

the various papers, with one exception, which were read on the occasion.

MORNING SESSION. STUDIES.

By W. ADCOCK.

By the title I give to this short paper, I mean detached parts of pictures, as distinct from those composites which, when joined up and employed, we, in a certain sense—not its highest—call a picture. If in a landscape we take foreground, middle, and extreme distance, we get the elements necessary to a picture. If of these we take one section only, we should probably call it a view. Now, if out of the foreground we took a large thistle and produced it separately, we might, however pictorially it was treated, very properly consider it a study.

Similar ideas apply to figure. To get a picture we should look beyond a mere bald figure for accessories to give completion to it. In the production of a large and elaborate photograph we can easily see how necessary it would be to study every part separately. The pose of a model, the turn of a head, the exact expression, the disposal of the hands, the folds of drapery, the position of a chair—all would be worked out, not merely by thinking of, but by producing pictorially. In this photographers only follow in the wake of painters, who, fortunately for the world, give it their first and upward thinkings towards perfection, in the form of studies.

We know how a painter, when thinking of a great work, first makes studies of its parts, then of its components as a whole—often more than once—before he decides how he will treat his finished work. It had been so from the earliest days of art, and the studies of the old masters are amongst the treasures of the world. These are the histories of pictures, and show how first conceptions, crude by comparison, developed into those creations of genius which have delighted until now, and, while they last, will delight succeeding ages.

A distinguished living painter, a few years ago, took for the subject of his Academy picture that phase of French life we should call "washing clothes on the banks of a stream." The scene was laid at Etaple, with the village in the distance. He made studies in strong, bold water colour, of each group or single figure for his picture, and then he grouped the whole into a sketch, which could be called a study sketch, or a sketch study, and from this he painted in oils his large work.

By purchase, this larger sketch, which received completion as a finished drawing after the Academy picture was painted, together with the preliminary studies, came into my hands, and are not the less prized by me from the greater fame every succeeding year brings to the artist.

It is, I take it, safe to predict that a great master in photography, before deciding upon such a work as *Dawn and Sunset*, and while the subject is incubating in his mind, would make many studies of its parts.

But I aim to-day at creating an interest in one special class of studies. If we go to the Kensington Museum, we find studies of hands—for instance—that, from the interest attaching to them, are almost priceless. Why is this? It is because of the marvellous beauty of their drawing. It is notorious that, to the incompetent artist, hands are more difficult to draw than faces, and it is common to find, in otherwise fine pictures, a shirking of the hands. They are often an indication of something left to the imagination to say what. In new pictures remonstrance with this defect is met by the remark, "Oh, do not detract from the power of the head by minor details!" This interpreted means, "We don't profess to paint hands." Yet hands give great scope to the master for brush-drawing. Reverting to Kensington Museum, I would ask what sum would purchase the studies of Mulready, mounted on a single revolving screen, to be found there? They are studies of this order—hands, feet, and detached limbs. Many of these probably were drawn on days too dull to paint in, or on winter evenings. Is there a hint here? Can we, by camera and lens, take hands or feet, enlarge them to life-size, and produce *perfect drawing*? Can we not produce every line of graceful beauty found in the hand of girlhood, the muscular vigour of manhood, and the loose, wrinkled skin of age, with a fidelity few capable draughtsmen would spend time in producing? Before we give a negative reply to this, I say, let us try.

Is another hint here? Would hands and feet, and eyes and ears, so produced, have value as copies in our schools, Board and otherwise, where drawing is now so largely taught? This seems to me a question for a professional. I hold up the hint in large letters. If worth anything, use it; if not, let it go.

Perfect drawing, to the trained eye, is ever a thing of beauty. With the lens, perfect drawing can be unquestionably obtained by taking small and enlarging.

What to-day would be the value of a photograph of the hand of Wellington, or, say, the sword-hand of Murat? If these things would be prized by a nation, will an exact portrayal of your hand be without interest to your grandchildren?

The power of enlarging given to amateurs by bromide paper is almost illimitable. I am only just beginning to find it out. For years I have been working directly, figure, unusually large in size. I like it still, but I am a convert to this, that he who will afford a large lens with advantage may; while he who will be content with a small rapid rectilinear (say eight-inch focus) may produce splendid work, both directly and by enlarging. And here, at the risk of telling those who know, I tell all who

do not, a lens that will take a plate sharp to the edges will enlarge *that plate* to any required extent. With the size I have named, I take $7\frac{1}{2} \times 5$, and enlarge up to 23×17 .

But of studies. Oh, amateurs, what a field you have! Of what *cannot* you make studies—I mean art studies, if you so treat them.

Besides the hands and feet I have specially referred to, what have you not in figure! An expressed thought—an idea—a sentiment—a passion—an act being done, all of these are open to you, with your own room, or, if you prefer it, with your back-yard as a studio, and a blanket on a wall for a background. A turkey is a fine study; a brace of hares, a couple of rabbits, and a couple of ducks; a big thistle is splendid, big as a good-sized gooseberry-bush: take two, one growing and vigorous, the other withered and dying, both in bloom—mind that—and when taken and enlarged, look at the drawing of them. The foliage of a growing carrot is beautiful—try it; so is a spray of apple-tree in leaf and bloom.

Then of dogs! Oh, the long-haired little dogs, the Dandy Dinmont, and every variety of long-haired Scotch poodle. What a dog for a study is the colley!

I tell you the facility of enlarging gives you over all these things a power of making of them things of beauty. One advantage is they are at hand, and you have not to go ten or twenty miles to find them.

I forgot a cat. I will show you a cat. "A cat" would be your description of it—mine is "My cat." It is a distinction with a difference, which leads me to say your cat would be of more value to you than an unknown one. Colderoy paints cats; as Mark Twain would say, WELL, Colderoy does, but we cannot all afford to buy the delightful cats he does paint. Will those who cannot be content with one on bromide paper, as I am? It is a study I commend to your notice.

I will not weary you, but before my last word let me say there is nothing in the study which will bear careless manipulation. The diffused bluntness I have held permissible, if not advocated, in large direct work, will not serve in enlargements. A negative must be sharp all over, or those parts out of focus would, by enlargement, be terribly out of drawing; and what I am holding up for is *beauty* of drawing.

To the beginner, and to those who have a bad one, I say, Get a good lens. Do not expect, for thirty shillings, an instrument as good as, at some makers, you would pay five pounds for. Let me not be understood as advocating these studies to the exclusion of other and more extended work—to landscape, to seascape, to figure in every phase. What I say is, that in studies taken small and enlarged you have a class of work second to none in interest; work that, by the very care and thought you give it, will befit you for pursuing, with more intelligence than you would otherwise possess, every phase of picture of which photography is capable. Some of the studies I have suggested may be considered photography made easy. I may be asked what scope does a turkey or a brace of hares give for showing the art side? I reply, the lines, the lights, the shadows, may be harmonious and exhibit good taste from one arrangement, but obtrusive and exhibit bad taste in another. In naming some things here, I am, perhaps, thinking of the amateur newly fledged, and showing him how easily he can find a subject at his own door when he wants one.

I enlarge by daylight, and the cost of adapting a camera to the purpose did not exceed 3s. 6d. Nothing done to this camera prevents me using it for ordinary purposes.

I cannot forbear saying here that, apart from my advocacy of hands and feet as specially worthy every one's attention, it is to the studies attainable from the human figure generally I look for the greatest pleasure, the greatest instruction, and the easiest attainments. In coming into London a month ago, I saw a dozen good studies as I passed in a cab up a single street. If you care for landscape only, devote yourself to it. Ascertain what Millet, Corot, Leader, C. E. Johnson, and Willie Wyllie, have done in painting, and what Emerson, Bankart, Gale, and many others, are doing in photography. If you aim at attaining their height, go ahead, but spare your friends view-taking.

Do not think all required of a photographer is that when he goes for a holiday, he may take views of his playground. He should become an amateur that he may improve his taste, cultivate a love of the beautiful, distinguish it from the commonplace, and inoculate his children with the virus.

I think, to the amateur, there are some ruts in the photographic road. Keep in them if you like; I only point to them. A certain make of plate may be a rut; Beach's developer is a rut; photographic time-tables are an awfully deep rut; landscape only is a rut; and—yes, decidedly!—everlasting figure must be another.

My last words are, whatever you do—however much, however little—aim with all your energy at raising photography to an art by putting art into your own work. Without it the best *technique* is valueless.

TESTING THE SENSITIVENESS OF PLATES.

By W. K. BURTON.

THE term "testing the sensitiveness of plates" is one which should scarcely be used at all, for it involves the supposition that we have some standard or unit of sensitiveness wherewith we may measure, or in terms of which we may state, the sensitiveness of plates. Now we have no such standard, and, so far as I can see, are not likely to have one. For this reason the only thing that we can do is to *compare* the

sensitiveness of plates, and I shall presently show that even this is impossible with anything like accuracy. I shall, however, say a few words on the practical methods, whereby we may compare approximately.

First, we have sensitometers. The principle of these instruments is well enough known. They are—or would be, were they accurate—a means for measuring the smallest amount of light that is capable of producing any developable image on a plate, the assumption being that the sensitiveness of the plates is in the inverse ratio of this amount of light. Thus, for example, if it takes only a quarter the amount of light to produce a developable image in the case of plate A than it takes in the case of plate B, plate A is four times as rapid as plate B, and it is assumed that it will give a similar negative in a quarter the time. But for this assumption there are, I believe, really no grounds; at any rate, we certainly have no right to take it for granted. And as it happens, it is not correct, or is, at any rate, only correct to a very limited degree.

The very fact that a supplementary exposure has the effect of greatly decreasing the amount of light necessary to produce a developable image, whilst it scarcely appreciably increases the camera sensitiveness of a plate, shows that the rule does not of necessity hold good.

For example, if we have a plate which would require eight units of light to produce a developable image, and we give it six units by exposing it to diffused light, it will evidently require but two more units of light—received through the sensitometer screen—to produce a developable image; but the plate will certainly not be four times as quick after it has received the supplementary exposure as before.

Now, the question is, do we not have plates differing in their actual construction, somewhat as the plate we have imagined differed before and after it had received this supplementary exposure?—plates, that is to say, whose variation in sensitiveness is not in the inverse ratio of the quantity of light necessary to produce a developable image. I certainly believe that we have, and I think it is very easy to show this.

We take a plate of the very highest sensitiveness, such as shows 25° on Warnerke's sensitometer, and we take another plate, say, about ten times as slow. It may show anything from 8 to 13 or 14. We now expose the second plate for such a length of time that we get an impression of the figure 25 on it, and we compare the two images. We shall see a vast difference. The last row of five figures in the very rapid plate will be a mere shadow, and the second row will be but little better. In the case of the slow plate, which has had the very long exposure, figure 21 will probably show with a fair amount of distinctness, and in the second row from the end—figures 16 to 20—the density will rise very rapidly.

It will probably have taken from twenty to thirty times as long exposure to get out the figure 25 on the slow plate as on the quick plate, but if we give the two plates exposures in the camera, varying as 20 or 30 to 1, is it to be supposed that we shall get two similar negatives? We certainly shall not. If we have been, in both cases, on the under-exposed side, we shall find that we have, perhaps, exactly the same amount of shallow detail in both cases, but that great part of the detail which is thin and ghostly in the rapid plate is strong and vigorous in the others. Nor can we, by varying the exposures in any way we choose, get precisely similar negatives in the two plates. The curves of sensitiveness are not the same, and no possible exposures will give negatives precisely similar. All that we can do is to produce on each plate that somewhat indefinite article, a "properly exposed negative." We may give the slow plates such an exposure that, whilst we have the very deepest shadows rendered on clear glass, we have all the detail strong and vigorous. We shall, however, find this impossible with the rapid plate, for we must expose till the extreme shadows are considerably veiled before we get that vigour of shadow detail which will entitle the negative to be called "well exposed."

It is on account of the differing "curves of sensitiveness" that we cannot really even *compare* with accuracy the sensitiveness of different plates.

There are, however, methods whereby it is possible to perform this comparison with approximate accuracy. Indeed, the very fact that we are able to speak of one plate as four or eight times as rapid as another is proof of this. I believe, however, that the only method of comparison which deserves the name of even moderate accuracy is that of giving, with the two kinds of plates to be compared, such exposures in the camera that each will produce a "properly exposed" negative, and comparing the exposures required to produce this result. The subject should be one having a great range of tint—for example, a white statuette draped in black velvet. It is thus possible to judge of the plate, as regards its capacity for rendering a range of tone as well as its sensitiveness.

Even by the intelligent use of a sensitometer, it is possible to get a comparison of sensitiveness which, if not even as accurate as that got by making two camera exposures, may still be of some practical use.

As to the sensitometer to use, there can be no doubt that those sensitometers in which the light is measured by passing through apertures of varying size, are the most accurate; but Warnerke's sensitometer has come so much more than any other into general use, that when a reference to "the sensitometer" is made, it is understood to refer to Warnerke's instrument. His sensitometer, as every one knows, consists essentially of a screen divided into twenty-five squares, each of which has a transparent film on it, which obstructs more or less of the light. The squares are numbered from 1 to 25, 1 being the most transparent. The instrument, apart from the subject of the light, to be mentioned hereafter, has several drawbacks. Thus, the opacity of squares bearing the

same number is by no means precisely the same in all screens that have been sent out. Again, in any one screen, the difference of opacity, or of transparency, as measured by amount of light allowed to pass, is not proportionately the same between each contiguous two squares throughout the screen. Still, its convenience is so great that it will probably be a long time before Warnerke's sensitometer is superseded by any other.

Now as to the light. That proposed by Warnerke is a luminous tablet, prepared by coating the back of a sheet of glass with sulphide of calcium in solid paraffine. The idea is ingenious, but unfortunately it does not appear to give the very best results in practice. The amount of light emitted not only varies between one screen and another, but it also varies from time to time in the same screen, the tendency being, apparently, for this screen to become less luminous through time—that is to say, capable of absorbing a less quantity of light.

It cannot, however, be contended that a slight variation in the light used for a sensitometer is a matter of great consequence, because, although each step or degree in Warnerke's sensitometer is so great as to be represented by an advance of 33½ per cent., two contiguous squares being intended to allow amounts of light, varying as 4 to 3, to pass, yet these degrees are so fine, or rather the capacity for observation is so poor, that it is all but impossible to read to a single degree, the last two or three figures being so faint that it is almost impossible to tell just which is the last. For example, we sometimes come to the conclusion that 20 is the last figure visible, and then, turning the plate to a certain angle, we see one or two figures more. This being so a variation of, say, 5 to 10 per cent. in the light used cannot be considered to be of much moment, and, in fact, a gas burner with any good regulator does not vary so much as to render it unsuitable for use with a sensitometer, it being understood that no attempt is to be made absolutely to measure the sensitiveness of plates, but merely to compare the sensitiveness of one with another.

The method of procedure which I recommend is as follows:—One of the two plates to be compared is exposed to the burner at a fixed distance for any length of time that will give less than 25° on development. The plate is developed and fixed. A certain square is now selected, which shows a density about equal to the density of a piece of shadow density in a negative. The next operation is to give—by several trials—such an exposure to one of the other batch of plates that the same square will show the same density. The sensitiveness of the plates is then, approximately, inversely as exposure required.

I do not wish to condemn altogether the method of exposing two plates, under the sensitometer, for the same length of time, and of comparing the results after development. On the contrary, this is my own continual practice; but then I do not pretend to be able to tell with any degree of accuracy what are the relative sensitivenesses of the two plates exposed, and even the kind of idea that I am able to form is got by judging, not of the last figure, or of any one particular figure, but by taking into consideration the whole range from beginning to end, and it is the result of long practice that any useful information can thus be obtained.

When I advise that gaslight be used, I am leaving out of consideration isochromatic plates. These may, of course, not be compared by gaslight with ordinary plates, for sensitiveness to daylight. The slight difference that there is between one ordinary plate and another with regard to its sensitiveness to yellow light does not appear to vitiate the tests performed by gaslight. The plate which is most sensitive to gaslight is most sensitive to daylight (amongst ordinary plates), and to practically the same degree.

A word as to the developer to be used. There is a cry amongst some that it is necessary, before we can get a standard of sensitiveness, to have a standard developer, to use—that is to say, the same developer for all kinds of plates. Now this appears to be the most idiotic and meaningless proposal that ever was made. It seems to me to stand to reason that every plate should be developed with whatever developer suits it best—gives, that is, the best results with it.

We do not want to know the sensitiveness of a plate used with a developer which is, perhaps, particularly badly suited to it. What we want is to know the sensitiveness of a plate, as that plate is used in practice—which is, or ought to be, with the developer which best suits it. To require that the same developer be used for all kinds of dry plates, when it is a case of testing sensitiveness, appears to me to be about as sensible as it would be, with the same object in view, in regard to a wet collodion plate and a dry gelatine plate, to insist that both be developed with the same developer—with alkaline pyro, for example!

AMATEUR ENLARGING ON A SMALL SCALE.

By J. TRAILL TAYLOR.

THE problem of a simple and easy mode of enlarging for amateurs, as regards the lighting department of the operation, is still open to receive more attention.

I am the fortunate possessor of several oil lamps, whose fine Greek names do not sufficiently counterbalance the trouble in trimming the wicks (which in some instances are many), the great heat, and the unpleasant smell. Could an enlarging lantern be lighted with common gas, then, indeed, would all troubles cease, but carburetted hydrogen gas as supplied from the Company's mains is frequently deficient in illuminating qualities in a lamentable degree.

It is, however, well known to all of us that house gas may have its luminousness greatly intensified by mixing with it the vapour of some one or other of the numerous hydrocarbons. This subject has been brought before the world at various intervals during thirty years or more, and a greater or less degree of success has attended individual instances of the application. It is this system of illumination which I have thought might fittingly be impressed into the service of the photographer who, without having the mess with charred wicks and oil every time he wishes a light, might desire his appliances reduced to a gas burner and the whole preparation reduced to connecting a rubber pipe with the nearest gas bracket.

Of the various systems employed for more thoroughly carburetted gas, that which I bring before your notice is one of the Albo-carbon genus. I purchased it at one of our London shops for 8s. 6l., and having had it in use for some time can speak of it very favourably. Its principle consists in a piece of metal being placed above the gas flame, and which, thus becoming heated, conducts the heat to a chamber behind, which contains a hydrocarbon that vaporises at a temperature of 150 or more.

The arrangement is such that either the gas in its primitive state or after it has been enriched to saturation may be emitted at the jet, and, without having had recourse to photometry to determine the advantage, it appears to me that the intensity of the light is increased fourfold.

But in order still further to obtain the highest advantages offered by the system, I have had this modified burner constructed in which two flames are employed, one being about an inch behind the other, with an air space between. This is essential to success in obtaining the best effect.

[The speaker then exhibited and explained the construction of the gas burner to which reference had been made. By means of a socket which had a thread similar to any ordinary gas burner, this one could be lifted in or out of the enlarging lantern immediately, and by previously warming the reservoir, so as to initiate the vaporisation of the "Albo-carbon" inside the light, assumed its energy in half a minute after being ignited. He spoke of the disadvantage of dimensions in the flames; magitude, he said, was not compatible with the highest definition. Hence, having first secured the required brilliance, he interposed a screen or diaphragm between the lantern condensers and the flame, and as close as possible to the latter. The aperture in the diaphragm was circular, and it varied from half an inch to an inch in diameter, the smaller one giving greater sharpness to the enlargement than the other. The position of the diaphragm was such as to hide all the light save a very bright portion selected from the most luminous part of the flame. He found it also advantageous to insert immediately in front of the diaphragm a small plano-convex lens, which prevented some loss of light by concentrating it upon the lantern condensers, at the same time that it permitted the light to be brought a little closer to them. Regretting that the bright daylight prevented him from showing in practical operation the application of this light to his enlarging lantern, the condensers of which were six inches in diameter, he showed by drawings on the blackboard by what means this system could be applied to the enlarging of negatives of larger dimensions than it was possible to utilise for this purpose by the condensers of his lantern. With the larger diaphragm, the burner shown was quite applicable for projecting pictures on a screen sufficiently well lighted for a parlour lantern entertainment.]

AFTERNOON SESSION.

THE SULPHURATION OF PLATINOTYPE PRINTS.

By H. H. O'FARRELL.

Most of those whom I have the honour of addressing are aware that a controversy is now in progress in the photographic papers on the permanence of platinum prints. Strong opinions have been formed on both sides, and have been expressed with an emphasis which I am afraid has at times almost overstepped the amenities of debate. In initiating here to-day a discussion on a subject deeply interesting to many who work a process of unquestionable value, I hope to approach the matter—to use a phrase now current—on its "reflective" rather than on its "impassioned" side. I would also at once disclaim any pretensions to any but the most elementary knowledge of chemistry. I am simply here to explain to you certain experiments that I have been making—experiments which any one might have made—and to offer some crude guesses which those of greater ability may accept, or modify, or tear to tatters, as the interests of truth may demand.

I take it that most of you know what a platinum print is, and how it is prepared. For the benefit of those few who do not I will just mention that paper, sized or unsized, is coated with a mixture of a ferric salt and chloro-platinate of potassium, that it is exposed to light in the usual way under a negative, and then developed on a bath of hot oxalate of potassium. Where the ferric salt has, by the action of light, been reduced to the ferrous state, it is dissolved by the oxalate, and at the moment of solution converts the adjacent platinum salt to pure metallic platinum, which forms the image. So much is, I believe, certain, though there are probably other subsidiary reactions which are not quite so plain. The iron salt still remaining in the paper is dissolved out by successive acid baths, and the platinum salt, which is extremely soluble, is washed

out with water. There is then presumed to remain in the paper nothing but pure metallic platinum, which forms the image.

As this is an extremely stable substance, the prints have hitherto been supposed to be absolutely permanent. Monckhoven, almost alone among scientific chemists, has contended that they are capable of sulphuration, and in that opinion he has now found an unexpected ally in Mr. Andrew Pringle.

Mr. Pringle, as you are aware, subjected certain platinotypes to the prolonged action of a solution of sulphuretted hydrogen. He then found a remarkable yellowing of the prints to have taken place on the surface of the paper. I have repeated Mr. Pringle's experiments with considerable care, and can confirm the accuracy of his results as far as they go. The three series of prints which I now hand round I made on paper freshly purchased from the Company. With a view of ascertaining whether carelessness in the use of the acid baths would account for the results obtained, I gave one portion of each print one bath of acid, the second portion two, and the third three baths. The third strip had also a much more prolonged washing than either of the others. One half of each strip I mounted on cardboard for subsequent reference; the other halves were subjected for ninety-six hours to the action of a saturated solution of sulphuretted hydrogen.

They were then mounted in juxtaposition with the halves from which they had been torn. I think, for one thing, these examples clearly show that the more or less complete elimination of the iron salt has nothing to do with the discolouration apparent on the prints. This is clear, inasmuch as the third strips are in each case just as badly discoloured as the first or second. This would also show that the staining is not due to iron. You will notice that the discolouration is entirely on the image side, the back of the paper not being affected. This shows that it is not a deposit of sulphur in the pores of the paper, which would be equally on both sides.

I want you also carefully to notice that the image is in no way affected—a most important point; also that the discolouration is easily removable. The print marked C has been treated with a saturated solution of chloride of lime, which has completely effaced the stain without apparent injury to the image. The stain is not amenable to treatment with dilute nitric or hydrochloric acids, though dilute *aqua regia* seems to have some slight effect upon it.

All these things seem to show that some substance remains in the paper after the various manipulations, which is not wholly washed out and is capable of forming an insoluble compound with sulphuretted hydrogen. This may be either unreduced platinum salt or an organic compound of that salt with the sizing of the paper.

Some further experiments of mine, made with a view of determining whether this is actually the case, have not been successful. I have, however, the permission of Mr. Willis, of the Platinotype Company, to state that some experiments which he made on paper that had been exposed to peculiar conditions in America, point to the same conclusion. He believes it to be possible, by a slight alteration in the method of sensitising the paper, to obviate all danger from this source.

Anyway, it seems to me that the matter is one of scientific rather than practical interest. A discolouration that can be removed by means so simple as those I have indicated, and which, moreover, does not attack the image, still leaves the process as permanent as a steel engraving—and that is surely all that any reasonable person can desire. There is, however, one practical warning suggested by these experiments—if the most permanent results are required, pure, and not commercial, hydrochloric acid should be used in the clearing baths. The quantity of acid used is so small that the difference in cost is inappreciable.

ORTHOCHROMATIC PHOTOGRAPHY.

By W. H. HYSLOP.

BEFORE commencing my paper, I would express my exceeding regret that our worthy President has not taken this subject of "Orthochromatic Photography" out of my hands, for had he taken it up and given us the results of his careful research and immense knowledge of the subject, this would, indeed, have been a red-letter day in the annals of photography. At one time I intended to give you a sketch of the history of orthochromatic photography, but I have come to the conclusion that our time will be better taken up discussing what can be done in the future rather than what has been done in the past, excepting the last three or four years. For those, however, who care to go into the history, I would refer them to the various journals of photography from 1873 onwards. There is one point, however, in the history, which is indeed strange, and that is the great want of general interest in this most important subject. When we have named Waterhouse, Vogel, Carey Lea, Eder, Ives, and Abney, we have named, almost without exception, the only men who have written upon this subject during the last fourteen years. Why is this? Is it because we are too conservative, or is it that we have not believed in the experiments and statements of these workers?

In 1883 a patent was taken out and orthochromatic, or rather isochromatic plates, as the maker prefers to call them, were put on the market. They do not seem to have been generally successful, or brought into common use—and why? Probably because they were found unreliable, and may be further explained by the remark of a gentleman, who ought to know, that the maker was a good chemist, but he didn't know how to make plates. For my own part I think that unbelief in any chemical process of orthochrome has been at the bottom of this want of interest.

In 1885 a great cry arose throughout the length and breadth of the British Islands—and why? Because a German firm of photographers had been given permission to erect a corrugated structure in Trafalgar-square, and were allowed to photograph the national pictures. It is not necessary for me to go into the whys and wherefores of the question, but I would like to refer to a paper on the subject read before the Photographic Society of Great Britain by Mr. Bird, of the Autotype Company, a paper marked by extreme good feeling and a desire to give to an opposition firm the full credit due to them. The paper was illustrated by many examples of Messrs. Braun's pictures, as well as by photographs taken some years earlier by a Berlin firm, and showing the great advance in the rendering of the various colours. In the discussion which followed, it was, I think, the general opinion that the retoucher's pencil and brush had more to do with the change than any chemical means, and I would just quote "Free Lance" in THE BRITISH JOURNAL OF PHOTOGRAPHY of May 29, 1885. He says: "Mr. Bird's remarks, temperate and well thought out, are well worthy of being remembered, and, while leaving to his hearers the task of coming to a conclusion as to Messrs. Braun's mode of producing these excellent copies, he enables one to make a shrewd guess at his own opinions. It is true that the photographic public have for some time had before them details of a method of photography of great novelty; but, as the lecturer said, 'they were not impressed with laboratory experiments—they remember many discoveries that came to nothing and improvements that were delusions; they are not credulous of the practical application of new ideas.'

"These remarks are not more disheartening than true, and the condition described is not to be explained upon any single basis only. Many photographers rarely read a scientific article; others are indifferent, and prefer only to accept acknowledged facts, trusting to their commercial instinct giving them the ultimate advantage over their more scientific brethren; perhaps, most potent of all causes still, others have had such experience of reputed grand discoveries which have eventually proved to be ignominious failures, that they become wearied, and only try fresh plans when they are shown to be commercially successful by the touchstone of experience. It would be impossible for one man to try all the new processes invented and published; and a few years' experience will show that those ushered in with the most blatant assertions of excellence are usually the least meritorious, and those deserving, yet modestly proclaimed discoveries, get shelved. As Mr. Bird plainly puts it, photographers have had before them full accounts of a method of taking photographs in which colours are represented in a true scale of tones, but they have not adopted the process. Messrs. Braun have produced copies of oil paintings far superior to any previous work of a similar character; do they owe their success to clever retouching or to some modification of processes not new? We have, through the writer, Messrs. Braun's word that the latter is practically the case, and we have no right to doubt their word. They lead us to infer that the method is complicated, and this is what might reasonably be expected; further, we are told they will keep their knowledge to themselves as long as they can, and for this also no one can possibly blame them. If the improvement in Messrs. Braun's pictures should be owing to new chemical methods, photographers may rest assured that they will have to bestir themselves and do likewise; they cannot afford to be stationary."

Notwithstanding the talk at the time, the subject seems to have slumbered again, and for eighteen months nothing much was heard of it; but a time of awakening came, and all credit is due to Messrs. Dixon & Son for that awakening. The gentleman who has an interest in the Tailfer patent for this country has at the various societies' meetings done his best to minimise the services of Messrs. Dixon, but I am quite sure that I am not alone in thinking that, had Messrs. Dixon & Son issued their successful plates, we would never have heard so much of the Tailfer patent, nor would the gentleman have bought the English interest in it.

I now come to my own experiments, and I will give you formulae, and show examples from the plates prepared by the various formulae. The plates used in the following experiments are ordinary commercial plates, and the only care taken was that they should all be from the same batch. It has been said by the unbelievers that the orthochromatic effect is a mere matter of exposure; that, supposing you expose an ordinary gelatine plate behind a yellow screen, and long enough, you will get quite as good an effect as by the staining process. I have never yet heard any of them say how long the exposure should be in order to get the desired effect, but on the card marked A, which will be passed round, you will find prints from ordinary plates exposed on this particoloured board, with and without a yellow screen; the first was given ten seconds without the coloured screen, the others thirty and sixty seconds and five minutes with the screen.

If you examine the prints you will find that in the one exposed ten seconds there is no orthochromatic effect whatever; the light red is fairly good, but the other colours are in exact opposition to what they should be. In the thirty seconds one you will find that the violet and dark blue are darker than in the first, but you find also that the orange and yellow are darker, too, and the light red lost entirely; the sixty seconds plate is, I think, no improvement on the thirty seconds. We now come to the one exposed five minutes, or ten times the normal exposure, and here, I think, we get an improvement. We get the light red back again, but otherwise there is very little difference. I think these examples clearly

show that, to use an ordinary plate, exposing it a fair length of time and expecting to get a good orthochromatic effect, is not at all practical.

I will now take the series marked A. You will find at the top of this and all following cards a print from an ordinary plate exposed without screen, so that you may compare the various results with it. The first two you will see are from the Tailfer plates; they give a fair effect, but I may tell you that in order to get the two negatives I exposed two dozen plates. I couldn't keep the films on the glass; every known means was tried to save them before and after development, but all to no purpose. You can easily understand, if this kind of experience befell many who tried them, why their progress in this country has been so slow. The next two are plates prepared by myself, according to the specification of Messrs. Tailfer & Clayton, and exposed with and without screen.

I had tried this specification some time ago without success, and Mr. William Bedford stated at one of the Society's meetings that he had not been successful; but in order to give it a fair trial I tried it again with a like result. The examples give no more trace of orthochromatic effect than do ordinary plates exposed with screen for thirty seconds, and yet these are treated with tetrabromfluorescein, one of the claims of the patent.

The third pair on the card are Edwards's isochromatic plates, which give good rendering of blues and yellows, but at the expense of the reds, and this fault is, I find, in all the commercial orthochromatic plates. And at this point I should like to make an assertion, and for this reason: Mr. Edwards stated, at the last meeting of the Photographic Society of Great Britain, that his plates would give a good orthochromatic effect in daylight, and without coloured glass. Now I most emphatically state that there are no plates in the market which will give such an effect without a screen, and I very much doubt if anything but a collodion-bromide plate, treated, will give a result different in any way from an ordinary gelatine plate. You can judge for yourselves by looking at the examples.

And now let us turn to another card, B, and first of all we have Dr. Vogel's azaline plates. For some time past a great question at photographic meetings has been, What is azaline, and where can you get it? I have tried many places for it, but have never found it; so when the learned professor took out his patent some weeks ago, I thought I would find out now, but no; I am as much in the dark as ever. The doctor does not claim azaline, but simply all colours which readily fade when exposed to light. However, it does not much matter what it is, for, if the plates I had from his agent here are a fair sample, you can easily see their colour-sensitive qualities are very poor indeed.

The next two examples are from plates of my own preparation, and I think, if you look carefully at them and compare them with the examples from Dixon's plates, underneath, you will say they are in no way behind, and that in some things they are well ahead of, the commercial plates. The improvement is in the reds, and they give generally a better gradation. The great trouble with them, however, is that they do not keep, and that you must pour on the bromide and ammonia first before the pyro, or else you will get silver stain; but for any who wish to have a really good plate giving good gradation, and if they can prepare them the night before requiring, the above will give good effects.

The formula stands thus (stock solution):—

Erythrosine	1½ drachm.
Ammonia 88°	1 "
Alcohol	6 ounces.
Nitrate of silver, 1 drachm, converted into chloride with hydrochloric acid, thoroughly washed, and redissolved in ammonia and water, bulk made up to	2 "

To make up the bath take—

Stock solution erythrosine	1 drachm.
Chloride solution	20 minims.
Liquid ammonia 88°	1 drachm.
Water	6 ounces.

Place this solution in any convenient vessel, and bathe your plate for one minute; then wash well under the tap and put it aside to dry, which it will do in a few hours.

I was asked last night by a member of the Club, what light should be used for the preparation and development. As the change in the nature of the plate does not take place until dry after treatment, it is not necessary to use a very weak light. I use orange glass behind ground-glass, and have not found any fog from it. I use the same for development, only taking care that direct light does not fall on the plate until the image begins to appear, after which the plates seem to stand quite as much light as ordinary.

On card C, you will find examples from plates prepared with what is sold as eosine B. I am not chemist enough to know the difference between this and plain eosine, but you will see that plates prepared with the plain solution and others prepared with an addition of silver have no orthochromatic effect.

Series D gives examples of plates bathed in a solution of Magdala red, a dye mentioned by Dr. Vogel, and said to have good effect. I have not found it so.

Series E are examples of chlorophyl plates, the favourite process of Ives. I fancy there was something wrong about my chlorophyl, although

it was from what is known as blue myrtle, but at any rate I got little effect from it.

And now we come to the last card, F, and on it you will find prints from plates prepared with erythrosine plain and with the addition of citrate of silver; this last has no advantage over the formula given. I am very sorry that I have only had photographs from the coloured board to show; had the weather been favourable, I had hoped to have had a few landscapes, taken with and without the screen. At the meeting of the Photographic Society of Great Britain, when this subject was discussed, the question was asked whether negative paper could be treated. I replied to the effect that it could; and I have here to-day a few orthochromatised stripping films, which any who care to see may examine. And now, in conclusion, I trust there will be a good discussion, and that no more will this important matter be allowed to alumber, for why should we be content with error and untruth when we have the means at hand to make it otherwise? We will be well paid for any trouble in the preparation of plates by the enhanced beauty and charm of our productions.

RATIONAL DEVELOPMENT.

By ANDREW PRINOLE.

I HAVE some reason to fear that we are all of us too apt to look upon development as a mere mechanical, or chemical, or at least technical operation, necessary certainly, but objectionable, and unimportant so long as we get a negative that will yield us technically good prints. But I have equal reason to know and to assert that this is a very erroneous and very fatal view to take of one of the most beautiful phenomena to be found in science, of one of the most interesting actions observable in nature. With the beauty of the operation I have nothing to do at present; if any one deny it he must be curiously constructed. My point is to try to show the importance of rational development in the production of artistic photographs, and also to inculcate intelligence in the operation of development.

I wonder how many British amateurs have ever tried the effects of different systems of development upon plates, equally exposed, on the same or similar subjects. I wonder how many amateurs could say, even in a general way, what are the results of slow and rapid development, of abnormal quantities of the reagents and the restrainers, or even of the various kinds of development—pyro, ferrous oxalate, and so on. A great many amateurs, I fear, could not answer in a satisfactory or assured way at all. There is too much of the "15 drops of A and 5 of B" knocking about for satisfactory answers. "A thing that will print" is the definition of a negative for far too many people.

Now the immediate object of my remarks is to draw attention to the effects of modifications in development, and to suggest how we may use these modifications, so as to get not merely what we call "good negatives," but negatives that will give us prints correctly and artistically reproducing our subjects, and, moreover, reproducing them in the aspect we desire. When we buy a dozen plates, we get with them a formula more or less arbitrary and intricate; these formulæ are useful, as suggesting the normal qualities or the weak qualities of the plates. For instance, when, with some trouble, I have analysed a developing formula, and find an unusual quantity of pyro, I at once suspect that batch of plates to be one likely to give me thin, poor negatives, unless I take care. When, on the other hand, I find the formula gives a less than usual quantity of pyro, I expect a plucky, perhaps hard, negative, apt to want half tone. When I find the alkali larger in proportion to the restrainer, I suspect the maker of a wish to get for his plates a reputation for great rapidity; and when I find the restrainer powerful, I expect a plate with just a tendency to fog, or else a plate intended to allow of a long exposure, such as some workers seem to demand. Every time that I get a new make of plates I analyse the developing formula, and carefully note the proportions of the ingredient, but I never attempt to make up a formula precisely in the arbitrary and, as a rule, intricate manner formulated. But surely, no man in his senses can ever dream that any one formula will suit every case; any one who has developed a dozen negatives must surely know better than that. And yet I venture to say that a vast majority of us try to develop all our plates alike, be our subjects what they may. Mountains, waterfalls, glens, churches—outside and inside, clouds, seas, glaciers, coal-mines—all alike, "15 drops of A and 5 of B." That is what the maker's formula says, and who should know, if the maker of the plates does not? After our development has gone a certain length we find the need for modification, but we always begin with the formula. Now I want to chuck formula aside altogether, and use intellect instead. A formula ought to be simply a convenient method of keeping our reagents, and—the important point—of getting precisely the quantities of reagents that we require. A formula cannot be too simple. Plate makers and many other people seem to think a formula cannot be too complicated, for among the many formulæ I have seen I find all sorts of queer odd numbers of grains and drachms, ounces avoirdupois, and ounces chemical, Winchesters, pounds of various kinds—in fact, every kind of figure to confuse and annoy one. There is nothing talismanic in half a grain, nor any virtue in such a number as 7½. What we want is to get, without trouble or loss of time, a certain quantity, not of A or B, but of certain known chemicals. The "A" and "B" business has spoilt, in my humble opinion, a vast number of amateur photographers.

They rack their brains to calculate how much they require of A, even if by chance they know the chemicals which compose A, and they do not think how much pyro, or alkali, or bromide they require. A formula should be of such a nature that you can't measure it without knowing how much of its essence you require. Now, I do not care what strength we make our solutions so long as we know precisely what they are, and how to extract from them precise quantities of our reagents, but for development I find ten per cent. solutions by far the most convenient. Everything that is not used stronger than ten per cent. I keep in ten per cent. solutions—pyro, ammonia, bromides, citrates, potash, soda, gold chloride, soda acetate, &c. Put an ounce into a measure, and make up to ten ounces after solution—that is the whole affair, and ten minims are always equal to one grain; or, put in a drachm, and make up to ten drachms; or, put in fifteen grains, and make up to 150 minims. In all cases ten minims equal one grain. The advantage of this, or a similar method, is that one is bound to know what quantity of reagent is used, and so development becomes an intelligent, not a blind operation.

One formula, in particular, appears to me of the "talismanic" order, which quality accounts, no doubt, for its seeming popularity among amateurs. I hardly ever see an amateur paper without some question or other about the "Beach" Developer—so called, I understand, after the illustrious President of the New York amateur society. I confess I never made up a developer in this precise fashion, so there may be in it some virtue unknown to me; but as it stands in the ALMANAC of this year, it looks to me anything but promising. In the first place, it is a mixture of avoirdupois ounces—not exact—and chemical ounces, which is a bad start. Then it contains a very extraordinary proportion of sodic sulphite when the developer is mixed complete. I cannot see any need for such a quantity, even if sodic sulphite is the best, or a good, preservative, which, lately, I have begun seriously to doubt. The pyro solution looks something like ten per cent. (Mr. Beach states that one drachm contains six grains of pyro, which means ten per cent., but I have not tested this), but the potash is an arbitrary measure, and calculation is required to discover how much potash we have in "twenty minims or a quarter of a drachm." The developer may be a good one, but it is certainly not a simple one, and simplicity is important if we are to work with intelligence. If you want a good and perfectly simple pyro solution, dissolve a chemical ounce of bisulphite of potash in about eight ounces of water, and mix in a chemical ounce of pyro, finally making the bulk to ten ounces. As pyro is sold in ounces of 437½ grains, if you want to be very accurate, make the bulk to 4375 minims=9 ounces 55 minims. This requires no addition, works beautifully, and keeps for a very long time. I ought to say that I get my bisulphite from Messrs. Mawson & Swan, under the name of "meta-bisulphite of potash." I can discover no difference between it and the ordinary bisulphite.

Never, on any consideration, should the chemicals be mixed. For years I kept my bromide and alkali mixed, but I look back upon that time as a sort of nightmare. I cannot understand why for so long I deliberately handicapped myself in the race. It seems monstrous to bind yourself in such a way that you can't get ammonia without bromide, except by having extra separate bottles. Nowadays I would as soon put hypo into my ammonia or pyro as bromide. The great advantage of keeping each chemical separate is patent when we consider my next point, which is that very seldom ought two consecutive negatives to be developed precisely alike, that is if we are to carry out intelligent development. If our two consecutive plates were exposed on the same or similar subjects, then, after our first is developed and examined, we may be able to improve the next by modification of development. If the subjects are different the development ought probably to be different, and this brings me at last to the real gist of my argument.

I say different subjects require not only different exposures but different development, and on the development depends, not only the technical quality of our negative, but also the artistic quality of our prints. If anybody present is inclined to sniff at this statement, let me ask him to use a very convenient line of reasoning, namely, an extreme case. Take an interior, a dark one lighted here and there by windows. Certainly a negative of such a view would not be developed in the same way as an open landscape negative. These are, perhaps, the two extremes, but between these there are an infinite number of gradations, some of which I will touch upon.

When we have a wide open landscape without any marked foreground, we are certain to run a risk of wanting contrast, as well as fog in the distance. I would develop such a negative *slowly*, with plenty of restrainer and pyro, but I would develop it fully. An interior is different; we are certain to have violent contrast, so I should, in that case, keep down or omit bromide, use very little pyro, but a good strong dose of alkali, and I would not develop it nearly so much as I did the open landscape. Take the case of a landscape not stretching to any great distance, but having a dark foreground of foliage. What we have to fear is the distance becoming too dense before the foreground has all its detail out. Here again I would certainly begin with little bromide and pyro, but a good dose of alkali, and as soon as I had the dark details out I would add pyro, and bromide and alkali, if required, and this negative I should develop rather quickly, compared with my open landscape, for long development means contrast, *ceteris paribus*. When I fear under exposure, I keep down pyro and restrainer, and I rather concentrate than dilute my developer. I do not believe at all in the system of watering

the developer in such a case, though I know it is recommended by some. I have made many trials with various developers, and I always succeeded better with a short and sharp developer than by watering and waiting. It seems to me wrong, both in theory and practice, to play the watering trick.

We require not only to consider our *fears*, but our *hopes*, when we make up a developer. When we selected our view and made our exposure, we had, or ought to have had, a specific idea and a specific intention. We meant, or ought to have meant, to give our view some particular rendering to cause it to convey some particular sensation to those who are to see our print. We expose, or ought to have exposed, with this intention in our mind, but our exposure may be multiplied by our development; and our development, if not conducted appropriately, will either spoil our negative in *technique*, or, by a discreditable fluke, will cause us to produce a print different, or possibly contrary, to what we intended. So when we start to compound our developer, we must consider what we require as well as what we fear. I am well aware that some people plume themselves on trusting entirely to their exposures, and do not even take notes of their subjects, but develop all their negatives alike, and blindly; this sort of work may sell, but it is not what amateurs want. We want expression in our work, not topography merely. Now in development we have a mighty instrument for rendering expression. It is, however, impossible to lay down rules hard and fast for the use of the developer under this head, but I shall give a few very general hints on the subject. Lightness, brilliancy, contrast, *allegria*—it is hard to find a name for the quality—may be expressed by slow development, plenty of pyro and bromide, and full development. Gloom, mystery, age, and "all that sort of thing, don't you know?" are more likely to be expressed by a small quantity of pyro, with just enough alkali to give the details required, and in this case the development may be shortened.

In portraiture, development should not be carried nearly so far as in landscape, and just enough density should be acquired to hide facial colour defects. If an outdoor group can be made into a good picture at all, it will probably be done by a good quantity of pyro, and alkali sufficient to bring out all the detail. But I find groups very difficult on account of the diffusion of the light.

In regard to the alkalis used for development, there seems to be a considerable diversity of opinion. I always use ammonia when I can, but I have no particular objection to soda and potash. Using ammonia, you can have no restrainer if you choose, except that "evolved" from the emulsion; with potash and soda, you have a restrainer whether you like it or not. If my plates are not tolerant of ammonia, I put them in the fixing bath unexposed, but I have lost far more plates from using soda and potash than ever I did from red fog, unless I was using very old plates.

What we require in development is to think. We shall never advance a step if we do not know precisely what we are using, and if we develop blindfold our successes are half flukes and our failures serve us right. Away with all unknown and mysterious mixtures, and go for developing formulae to the fountain head, to the chemicals themselves, and not to *empyrean* bottles—that must be a mistake, surely! *Empyrean* bottles, that's it. And don't go mixing bromides and alkalies together, incompatible in development, nor avoirdupois and chemical weights—in fact, never mix your liquors at all till in your (developing) cups.

A VILLAGE PHOTOGRAPHIC EXHIBITION.

THEALE, a Berkshire village of about 800 inhabitants, away "far from the maddening crowd" of any town, has just held its photographic exhibition. Through the exertions of one of its residents—an amateur—it has got together a goodly gathering of photographers, representing the work of some of our leading professionals and amateurs. Six silver and six bronze medals have been awarded.

Framed photographs to the number of 285 find place in the village school, a room about forty-four feet long by twenty feet wide, and if all are not well lighted the architect of the building is not to blame, nor the hanging committee that all are not hung "on the line."

A class room adjoining is temporarily darkened, and occasional shows of lantern slides take place. An oil lantern displays the beauties of the slides on a screen of tracing cloth, which stands between the lantern and the spectators. A goodly lot of slides has been lent for the purpose.

The catalogue leads off with a list of patrons, the committee, and the local train service, followed by an address to the visitors by the Hon. Secretary, Mr. A. A. Harrison, the enthusiastic promoter. The list of exhibitors numbers seventy-eight, of which twenty-seven are marked by an asterisk as amateurs. A space is devoted to advertisements, but prominence is given to the local grocer and baker, the horse-collar manufacturer, the stationer and medicine seller; while later on plates, lenses, apparatus, "cheap," "reliable," "quick," "unsurpassed," "efficient," "unobtrusive," are well mixed up with Brown's cod-liver oil, church services, mineral waters, and home-cured bacon. The rustic anxious inquirer after the cost of apparatus will probably be disappointed to find by the advertisements that a camera costs 20s., a lens 9s., and sliding legs (best make) 12s. 6d.!

There are many fine photographs on the walls by professionals, mostly familiar to visitors at the recent London Exhibition. The prices in many instances are put, ranging from ten guineas to 3s. 6d. Amateurs have responded to the invitation to a somewhat less extent, but there is some very nice work to be found for the looking, one exhibitor estimating the value of his views at £1 a-piece; while another, with an asterisk before his name, which should imply "amateur," informs the public, in large print on his exhibits, of his great merit, and gives a list of medals he has gained. It is gratifying to find that the local photographers, amateur and professional, have come well forward with their contributions. There is a good show of apparatus on the table, and the most recent inventions and appliances. All round, Theale has shown admirably what can be done with pluck and energy. To quote from the address "To the Visitors," "So far as we know this is only the second Photographic Exhibition which has been attempted in a village, but we think we may with pardonable pride ask our visitors if the result of our efforts is not worthy of imitation."—[Yes! most certainly.—Eds.]

Department for Inexperienced Photographers.

THE USE OF A SWING BACK AND THE EFFECTS OF TILTING THE CAMERA.

It is quite pertinent that an inexperienced photographer should inquire—What is the use of a swing back to a camera, seeing that it increases the expense, adds to the bulk, and that good photographs can be taken without it? All this is quite true, and yet it has certain uses which we shall proceed to indicate.

Let us suppose that the subject to be photographed is a rather tall building, the top of which cannot be got quite into the plate. One naturally tilts the camera, or points it a little upwards, until the image of the building has assumed its proper place on the ground-glass, for of course the higher it is pointed upwards the lower is brought the image of the building on the plate. We know very well that the same thing can be achieved, in a modified degree, by sliding the lens as high up on the camera front as it is possible to do, but this implies the employment of a lens embracing such a wide angle of subject as to permit it to cover a field greatly exceeding the dimensions of the plate.

When the top of the building which we have impressed into our service for illustration can be got properly in by raising the front, and at the same time keeping the camera quite level, all is well, and a rigid bedded camera will certainly answer in this case as well as any other. But this will prove exceptional.

By tilting the camera upwards the whole building has now been got nicely on the plate. It may, or may not, all be sharp in focus, but this is of no consequence to us at this stage of the illustration. Observe, however, that by the mere act of tilting, or pointing the camera upwards, the back has been removed from its normal vertical position when standing level. Now as it is a principle in all projection that when photographing a vertical object, like a building, the sensitive plate must also be in a vertical position, the consequences of this non-agreement of building and camera back as regards both being vertical are that the photograph will be distorted. The middle of the image will be all right enough from top to bottom, but the sides will converge and be quite off the perpendicular.

We shall now show wherein a swing back remedies this evil. When a camera possesses this appendage, after the instrument has been tilted and the subject adjusted it is only necessary to loosen the screw by which the back is made to retain its place, and bring the ground-glass to a perfectly vertical position in order to ensure the image being projected on the ground-glass with rectilinearity.

It will be instructive to focus a house or any square object, and then watching the effect upon the sides of the ground-glass while the back is being swung out and in alternately. Convergence and divergence of the perpendiculars will thus be induced in succession.

In ordinary landscape photography, especially when employing a large camera and a lens of long focus, the swing back is frequently of great advantage in getting the delicate shrubs, grasses, or flowers in the immediate foreground quite sharp, which cannot always be done if the camera has a rigid back. After getting the distance quite sharp, swing the top of the camera back so as to be farther from the lens than when in its ordinary square or normal position. By doing so, it will be found that the foreground objects, formerly rather out of focus, will now be rendered exquisitely sharp. If the camera be so constructed that the ground-glass is pivoted at the centre of its sides no refocussing will be necessary, as the distance will suffer no change; but if it swings by a hinge at the bottom it will be necessary to refocus the centre, as by the tilting of the ground-glass the previous focussing of the centre is disturbed.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 1830.—"Improvements in Bearings for Photographic Rolling Presses, Rolling Machines, and the like." W. E. MOSS and JOHN MITTON.—Dated February 5, 1887.

No. 1875.—"A New or Improved Method of Regulating the Duration of the Exposure of Sensitive Plates to Light in Photographic Cameras." J. ADAMS.—Dated February 7, 1887.

No. 1902.—"A Mode of Lighting Pictures, Coloured Prints, or Coloured Objects for the Purpose of Photographic Reproduction." W. DE W. ABNEY.—Dated February 7, 1887.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
February 15.....	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
" 15.....	North London	Myddelton Hall, Upper-st., Islington
" 15.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 16.....	Bristol and W. of Eng. Amateur	Queen's Hotel, Clifton.
" 16.....	Bury	
" 16.....	Edinburgh Photo. Club.....	5, St. Andrew-square.
" 16.....	Hyde	Meehanes' Hall, Hyde.
" 16.....	Manchester Club	
" 16.....	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 17.....	London and Provincial	Mason's Hall, Basinghall-street.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at the ordinary monthly meeting of the above Society, held at 5A, Pall Mall East, London, the President, Mr. James Glaisher, F.R.S., occupied the chair.

Mr. W. F. DONKIN, the Hon. Secretary, read the report of the Council for 1886, which set forth that during the year important advances had been made in orthochromatic photography, and that a period of calm had settled down in relation to researches into the chemistry and philosophy of gelatine processes, in which much success in working had been attained. Valuable germs of theory had been brought forward during 1886, to bear fruit, perhaps, in subsequent sessions. The annual Exhibition had displayed a greater knowledge and advance of art than its predecessors, and numbered among its visitors the Duchess of Teck and her daughter, the Princess Victoria. Mr. T. Sebastian Davis had given valuable aid at various lantern evenings held by the Society. At the Exhibition 1296 separate photographs had been on view, and there had been a larger number of visitors than on previous occasions; the exhibitors had displayed greater skill in introducing figures into landscapes, and a greater tendency to give photography the attributes of a fine art. The pictures on receipt had been divided by the judges into four classes before they knew the names of the exhibitors: the first and second classes were given the best places, the third class then had its turn, and the fourth class was left for final judgment. The report expressed regret at the paucity of scientific objects at the Exhibition, more especially in the matter of solar, stellar, and planetary photographs. Fifty-four new members had been elected during the year, and but few had resigned during the same period.

Mr. W. S. BIRD, the Hon. Treasurer, read the Treasurer's report for 1886, which recorded £22 11s. 11d. in favour of the Society as compared with the previous year, so the funds were in a healthy state; indeed, the subscriptions for 1886 were the highest of any year in his record. It was desirable that the Society should have a permanent home, a library, and a laboratory; practical difficulties stood in the way of obtaining them, which, however, were but difficulties to be overcome. He thought that it would be well to have one or two distinguished artists on the jury of the Exhibition; still, whenever that had been the case there had been more complaints from exhibitors than usual; he should like to hear the opinion of the members upon this point. The Council thought of appointing a committee to consider whether the *Journal* of the Society should be issued less frequently, as such action would much reduce the expenditure thereupon. The Society usually made a clear profit of £40 or £50 by each of its Exhibitions. Among the expenses of the past year was an item of between £3 and £4 for the travelling expenses of the Assistant Secretary whilst making inquiries as to alleged injuries to the frames of pictures sent to the Exhibition; the complaints had been discovered to be well founded, and the injuries consisted chiefly of scratches, apparently due to the friction of the frames against each other; nails and projections in the backs of some of them had much to do with it; so, whilst the Council would devote special care to the matter in the future, it was hoped that exhibitors would aid by putting their pictures in frames with flush backs. The bringing out of the little book on Platinotypy cost £16; each of the members had received a copy, and 300 were left for sale to the public. During the year £50 had been invested in Consols, making £150 there altogether. What with that money, and with the cash in the bank, and the property possessed by the Society, it had in hand the equivalent of £528, and no liabilities: that was its position at that day.

Votes of thanks were then passed to Mr. W. S. Bird, the Treasurer; to Messrs. Ince and Francis Cobb, the Auditors; and to Captain Abney, the Editor of the *Journal*.

The Scrutineers reported that Mr. James Glaisher had been elected President; Mr. H. P. Robinson, Vice-President; and Messrs. C. E. Abney, Francis Cobb, T. Belas, W. K. Burton, W. F. Donkin, J. Traill Taylor, and Colonel H. Stuart Wortley, members of the Council.

Votes of thanks were then awarded to the acting Scrutineers, Messrs. Standell Addenbrooke, and W. M. Ashman.

Mr. T. SEBASTIAN DAVIS proposed a vote of thanks to the President, who

had been in that position, he remarked, for seventeen years; this was seconded by Mr. WILLIAM ENGLAND, and carried with acclamation.

The PRESIDENT, in returning thanks, said that any one who occupied that or any other official position in the Society should do his duty; at the beginning of every year he made a list of the days in the year upon which it would be his duty to be present at the transaction of the work of the Society.

Dr. DONKIN, in response to a vote of thanks to the Hon. Secretary, said that, as he had stated on a previous occasion, all the thanks were due to the Assistant Secretary, Mr. COCKING. All he (Dr. Donkin) did was to read the annual report.

Mr. JAMES B. SPURGE then read a paper upon *A Method of Estimating Photographic Deposits with reference to the Printing of Negatives*, which memoir was illustrated with diagrams and accompanied by tabular statements. The measuring instrument used was a Spurge's sensitometer, consisting of a number of different-sized holes in a brass plate, each bored with micrometrical accuracy, and all bearing a definite ratio to each other in aperture; behind each hole is a short rectangular blackened brass tube, open at the end farthest from the brass plate, and against the open ends of all these tubes the plate to be tested is placed; thus the sensitive plate forms the back of a number of little blackened chambers, into each of which light enters through a hole of a particular size at the opposite end. The author said that the object of his paper was to set forth a method of defining the effect produced upon a sensitive film by the combined action of the developer and of the exposure to light which it has received; consequently several parts of the film must receive a series of exposures bearing a definite ratio to each other, and this could be done by the aid of the sensitometer which he and Mr. MUCKLOW introduced to the notice of the Society in 1881. The sensitometer had the advantage of a fixed range, the relative amounts of light being independent of any variation in the intensity of the illumination; the results also show any defect inherent in the film, such for instance as granularity, because no medium intervenes between the light and the film under examination, for such medium is always liable to introduce its structure or other defect into the results, and to mask the effects intended to be observed. The instrument also had the advantage of exhibiting inappreciable deterioration with hard wear. The ratio of the sensitometer is 1 to 1.2599, or four to five; every third chamber receives double the amount of light, and this condition is found to be constant within very narrow limits, whatever be the method adopted to illuminate the pierced plate, provided the light emanates from a sufficiently large surface, such, for instance, as from the surface of a sheet of opal glass. Prints thus obtained upon platinotype and upon albumenised paper give a very near approximation to a constant, but such is not the case with sensitive bromide of silver films. Upon developing a gelatino-bromide film which has been exposed behind a negative a deposit is obtained, which varies inversely to the opacities of the negative; he preferred to view this result as caused by the light being reduced in actinic value after transmission, as compared with its value when incident. The author here described at some length his attempts to prove that the ratio of the transmitted to the incident light is a constant for various degrees of opacity in differently coloured media, when measured with gas and bromide films, or with solar light and albumenised paper; the opacities were found to agree well together, notwithstanding great differences in the exposure and great variations in the intensity of the incident light. One object of the author's paper was to show a means of determining with certainty the range of any photographic plate, and of being able so to specify the range that a plate-maker should know from such specification exactly what description of plate is required, and whether he has met the requirement. In one of Mr. Spurge's diagrams of results, it was shown by plotted-out curves that the density of a negative does not increase proportionately to the exposures, and the advantages for quick printing of negatives of low initial density were graphically indicated. He set forth, also, the values of the influence of the plain glass and the film of plain gelatine upon the printing properties of a negative. Of the influence of a dirty atmosphere, in which, as in towns, notes of solid matter are floating, Mr. Spurge said that such notes reflect light according to their nature and to their number; when they are opaque and in focus, they reflect equal amounts of light upon all parts of the film while they are in transit, and so will lessen the indicated range of the subject which is being photographed. A subject possessing few contrasts can have those contrasts photographically increased by placing an absorbing medium between it and the film; this will have the same effect as staining in the case of negatives, with the exception that the disturbance will be greater in the shadows than in the high lights. He hoped that his remarks would hasten the adoption of means of comparing results in a manner which can be generally recognised, and which results shall be universally comparable one with another; any process, developer, or mode of manipulation will then quickly drop into its proper place in the order of merit in relation to its predecessors.

A vote of thanks was awarded to Mr. Spurge for his paper, and the discussion was adjourned.

Mr. C. Wray Palliser and the Rev. C. H. Sutton were elected members of the Society, and the meeting broke up.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

On Thursday night, February 3, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. A. Cowan presided.

Mr. F. M. EDWARDS gave a demonstration of the development of platinotype prints by gently drawing the exposed proofs through a hot solution of potassic oxalate and then immersing them in successive baths of water acidulated with hydrochloric acid; the resulting pictures were fine ones, with rich and deep blacks.

Mr. W. WILLIS said that the paper was sensitised with a mixture of ferric oxalate and potassic chloroplatinate, and that the light acted almost entirely upon the iron salt, reducing it to ferrous oxalate, which developing substance was therefore formed in close contact with the platinate salt. He first discovered the method by means of a test-tube experiment because he had pre-

viously come to the conclusion that ferrous oxalate ought to reduce a salt of platinum; at that time no solvent was known to him for ferrous oxalate, until he saw in Watts's *Dictionary of Chemistry* that the French chemists, if he remembered rightly, had discovered that it was soluble in neutral potassic oxalate. Such was the early history of the thing.

Mr. A. MACKIE asked if other salts could be used for development. Mr. WILLIS replied that he had indicated a great many. At one time he thought that oxalate of potash was only a solvent in the matter, but now he thought that it added to the reduction, but it did not account for the evolution of CO₂ during the reaction.

Mr. EDWARDS exhibited a print upon paper which had purposely been allowed to get damp before exposure under the negative, to show the general degradation of the picture thereby produced.

Mr. A. L. HENDERSON asked what was the speed of printing. Mr. EDWARDS responded that the time of exposure was about one-third of the time necessary with the ordinary albumenised paper printing. He here exhibited a picture he had just developed of the new marble bust of Mr. Glaisher.

Mr. MACKIE remarked that it was a portrait of "The Grand Old Man." Mr. J. B. B. WELLINGTON had tried to print on platinotype paper by gas-light, by giving an exposure close to the light for half an hour, but could obtain no impression.

Mr. WILLIS stated that he had been able to print upon the paper at a distance of eighteen inches from a powerful electric light, but, practically speaking, daylight was necessary for everyday work. He thought that he should be able to bring out a platinum negative process, not of commercial value, but proving that the smallest action of light had a little effect.

Mr. EDWARDS here developed a picture much larger than the bath, by drawing it through the solution one part after another; he said that in so doing it was necessary to take care that the paper did not touch the hot sides of the bath outside the solution, for that would stain the print.

Mr. HENDERSON asked what was the effect of leaving the prints longer upon the developing solution.

Mr. WILLIS replied that the lights developed almost instantaneously, but that a little more could be obtained in the shadows by longer development.

Mr. MACKIE asked if the temperature of the bath were a matter of importance.

Mr. WILLIS answered that it determined to a certain extent the character of the image; by development at a low temperature a more granular deposit resulted, and a transparency more like the transparency of an engraving; also, with a cooler bath errors in exposure could be counterbalanced to a certain extent; by its means, also, too much strength of image, due to over exposure, could be avoided. It was possible to develop upon an absolutely cold solution. The paper could be prepared, if desired, so that it could be used with thin negatives.

Mr. J. W. COX asked why he obtained different colours from different negatives.

Mr. WILLIS was unable to give an accurate answer to that, he was sorry to say; the fact was that in those cases in which a brown was produced the image undoubtedly was not all in metallic platinum; either one of the oxides was present or platinum chloride, and giving a warmer tone. To produce sepia-looking pictures, he used a different developer; he regarded the brown proofs as permanent; they were acted upon by strong hydrochloric acid before they were dry, but he had never been able to act upon them with it afterwards; even those brown images were very largely composed of metallic platinum.

Mr. HENDERSON asked how long the paper would keep in good condition if kept perfectly dry all the time.

Mr. WILLIS replied that that was an unknown quantity, but he could say with almost absolute certainty that it would keep good for two months. Sometimes paper a year old proved to be as good as new, but, as a general rule, he gave two months as the life of the paper, even when kept all the time in a tube with chloride of calcium.

Mr. J. HUBERT asked what negatives were best for the process.

Mr. BRIDGE said that very often the getting of the best negatives for the purpose was only a matter of proper exposure.

Mr. WILLIS remarked that Mr. Edwards could best speak on the point, since his experience was so great.

Mr. EDWARDS stated that good vigorous negatives with proper gradation were the best.

Mr. J. TRAILL TAYLOR said that Mr. O'Farrell had told him that a negative had been sent to a certain society as one which was very unsuitable for platinotype printing, yet he (Mr. O'Farrell) obtained excellent platinum prints from it.

Mr. EDWARDS remarked that he would now lay before the meeting some pieces of the actual platinotype prints which had been yellowed with a sulphide by Mr. Pringle, and which they would see had Mr. Pringle's handwriting on the back; he had put fragments of them into a little weak chlorine water, which had removed all the yellowness, and they could piece the portions so restored with adjacent pieces which he had not submitted to chlorine water, so that they might see that the treated parts of the print had been restored. Some pieces of developed bromide of silver prints submitted to the same treatment with chlorine had none of the image left.

Mr. HENDERSON stated that Mr. Edwards had restored to whiteness some pieces of platinum prints which he (Mr. Henderson) had discoloured with Schlippe's salt.

Mr. A. HADDON had put two pieces of a platinum print which Mr. Edwards thought could not be discoloured into sulphuretted hydrogen water to which a little ammonia had been added, and they changed colour; he restored the whites of one of them by dipping it into weak chlorine water. He then exhibited a platinum print which had been discoloured by the age of the paper; the discolouration might be due to the presence of iron yellowing under the influence of the sulphuretted hydrogen present in small proportion in the atmosphere. Or might it be due to some combination between the iron and the gelatine used as a substratum in the preparation of the paper? In the latter case a powerful solvent like chlorine water might be necessary to remove it, but if the yellowing were due only to the iron in the paper, hydrochloric acid would effect its removal.

Mr. EDWARDS thought that there was no gelatine in the paper he was using. Mr. HADDON responded that there was always gelatine in the size with which the paper was treated in the manufacture.

Mr. W. E. DEBENHAM concluded from what Mr. Haddon had said that platinum prints to be permanent should be finished in chlorine water.

Mr. WILLIS was unused to speaking in public, but would remark that undoubtedly many of the specimens then on the table had been so acted upon by sulphuretted hydrogen as to present stained whites, but that was not a necessary consequence, for he had applied that test to hundreds of platinum prints without producing any discolouration. His own impression was that iron was not the cause of the discolouration, partly from the colour of the image produced, and partly because the iron salt used in the process was very soluble and was mixed with a much stronger salt, which was dissolved out towards the close of the manipulations; he thought that the stain was produced by a combination of the platinum salt with the size used in the manufacture of the paper. He had tried to secure paper free from gelatine, but his impression was that the yellowed samples of paper before them contained gelatine, which was decomposed under the treatment with chlorine water. Doubtless any increasing discolouration of certain platinum prints with age was due to the presence of iron salts. He had only read one letter in the recent public discussion on the subject of permanency, because he thought that he was better employed in attending to other matters, but he had heard that throughout the discussion there was a most remarkable misuse of terms; it seemed that the whites had discoloured under sulphuretted hydrogen, and this was so stated as to be liable to convey the impression to the minds of most persons that the prints had discoloured. In the dictionary the definition of "printing" was "to imprint," that is to say, to make an impression on paper with something like printing ink; he presumed that the writer of the letter was an old photographer who thought that if the whites went the image would go also, hence his indefinite use of words which he applied to all photographs alike; but if he laid a discoloured silver print alongside a discoloured platinum print he (Mr. Willis) would say, "The former is not in printing ink, but mine is in metallic platinum." He thought that he had heard it stated that he used other salts than those of iron and platinum in the preparation of the paper, but he did not do so, and it was open to any one to test the matter; he distinctly stated that there was no other salt in the paper. Once he used silver and a sulphocyanide toning bath, and four or five years later he found out that he could use lead, with which he knew that oxalate of lead would be formed, and he thought that it might be altered by sulphuretted hydrogen. Lead, in the proportion in which he used it, was positively a benefit rather than otherwise, and some of the prints produced with it were now as pure in the whites as when they were first finished; in fact, Eder says that lead in contact with air is bleached in sunshine. However, he gave up the use of lead in the preparation of platinotype paper. He remembered a little thing which occurred in New York relating to the misuse of terms: an artist there, fond of a beautiful young lady, wished to have her likeness ever with him, so went to a platinotype photographer there to have a picture of her printed upon his shirt cuffs. A friend of the artist, who did not believe in the permanency of platinum, betted with him on the question of the durability of the portraits. A few days afterwards he again met the artist. Now the Americans are very particular about the purity of their linen, in spite of which the artist had kept on those cuffs for three days, when they looked faded all over, as the friend remarked the minute he cast his eyes thereupon; the reply was, "Well, they do look bad, and they must be taken to Wah Sing to be washed." This was done, and they came back as white as ever. Although Wah Sing was a terrible man, especially on buttons, he had not succeeded in washing out the platinum prints.

Messrs. C. H. Watkins and T. Watson were elected members of the Association, after which the meeting terminated.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Committee of this Association met at 181, Aldersgate-street, on the 2nd instant. The minutes of the previous meeting were confirmed.

Messrs. L. Blake, A. C. Edwards, B. J. Edwards, Friese Greene, T. J. Dixon, G. A. Garrett, W. England, J. D. England, William Bedford, H. Bedford, Lemere, G. P. Cartland, F. Wilson, T. Edwards, L. Bourquin, W. J. Basket, J. Rice, G. Carroll, W. Jones, W. A. Welford, R. J. Dubbin, W. Young, and Dutton, were enrolled as members of the Association.

The Secretary submitted the cash statement for the past year.

It was decided that the annual general meeting should be held on Monday, the 21st instant, at the above address, at eight o'clock, when it is hoped the members will endeavour to attend and introduce, if possible, new members to the Association.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting of the above was held at the Technical Schools, Broad-street, on the 27th ultimo.—Mr. S. Delicate in the chair.

The minutes of the last meeting having been read and confirmed, the following lady and gentlemen were elected members:—Mrs. Welford, Messrs. J. Chatwin, C. Chinnery, J. R. Curtis, C. Greenwood, W. S. Harding, J. P., R. W. Pumphrey, and J. S. Smithson. Mr. Frank Edwards was nominated for election.

THE HON. SECRETARY (Mr. J. H. Pickard) announced that he had received a communication from an anonymous member offering a prize of a standard work on photography for the best lantern slide exhibited at the next meeting, February 10 (lantern exhibition), to be the work of amateurs only; judging to be made by the Lantern Section Committee.

Sundry exhibits were shown, notably panel photographs by J. W. Welford, Gray's direct positive plates by A. Pumphrey, lantern slides and transparencies on Pumphrey's plates from Eastman paper negatives, and silver prints of snow scenes from Morgan & Kidd's paper negatives.

Mr. GODFREY asked: How is it I cannot get detail and density in my snow pictures, either with long or short exposures?

Mr. WELFORD: The negative shown is under developed, and must have been exposed in a strong light. It is always advisable in taking snow scenes to get in as much shadow as possible.

Messrs. B. KARLEEN, E. MIDDLETON, and J. NOCK gave their experiences with snow pictures, and mentioned the fact of the faces of figures taken in the snow coming out black on the prints, which arises from intense light diffusing itself on the plate, causing a kind of halation.

THE VICE-PRESIDENT (J. W. Harrison, F.G.S.) then gave his paper on *The Sensitometer*, prefacing his remarks by saying, although it was a good thing for the amateur to thoroughly understand the plates he used, by conquering all knowledge of them by the experience of exposure and developer, which rendered him nearly certain of obtaining good pictures at all times, still it was very useful to the amateur as well as the professional to be able to ascertain with accuracy the rapidity of any fresh make or batch of plates he may happen to come across, and have no previous knowledge of the working of same. The first sensitometer was made by Dean in 1856, and there are several recent ones—including those by Spurge and the celebrated Russian gentleman, L. Warnerke. The latter is the sensitometer by which the bulk of the plate-makers advertise the standard rapidity of their plates. Mr. Harrison then explained most fully this sensitometer (which shows great accuracy and has been the work of Mr. Warnerke for some years of close testing), and afterwards exposed several plates by magnesium light and developed with different developers, showing the certainty of the tell-tale of the instrument.

In the discussion which followed, Mr. PUMPHREY preferred keeping a standard lot of plates which he knew, and then, before using a fresh batch of plates, tested one of the standard and the new ones at the same time, and developing in the same dish.

Mr. MIDDLETON remarked that, of course, Mr. Pumphrey, making his own emulsions, would know whether they were iodide or bromide, because both these, although equal in the camera, would show unequal rapidity under the sensitometer.

The discussion ended in it being resolved that the meeting of February 24 should be set apart for the testing of different makes of plates brought by the members themselves, and developed at that meeting with—pyro and ammonia, by S. Delicate; ferro-oxalate, by J. Nock; washing soda, by J. W. Welford; potash and soda, by J. Iliffe; Beach developer, by J. H. Pickard.

MANCHESTER PHOTOGRAPHIC SOCIETY.

LANTERN SECTION.

THE second popular meeting of the session was held in the large Lecture Hall of the Athenæum on Thursday evening, January 27.—Mr. W. I. Chadwick in the chair.

Views were contributed by the following gentlemen:—Messrs. Gale, Brooks, Wilson, Flncham, Valentine, York; also by the following members of the Society:—Messrs. Greatorex, Coot, Burt, Muth, and Whittaker; in all, three hundred and fifty slides. The views were briefly described by the Hon. Secretary, Mr. Chadwick. A large number of the views were of a very choice description both in composition and manipulation, and well deserved the hearty applause they received from a large audience numbering about seven hundred.

A vote of thanks was accorded to the lanternist, Mr. J. G. Jones, for his services, and the meeting terminated.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE monthly meeting of this Society was held on Tuesday, the 1st instant,—The President in the chair.

After the routine business had been disposed of a report from the Council was read, recommending that a *conversazione* be held during next month, and suggesting March 9 as the date. A resolution was adopted confirming this, the place to be the large room at the Masonic Hall, the members present being earnestly requested to introduce suitable objects, photographic or otherwise.

Mr. A. S. PLATTS rose to remind the members that there was a question box which deserved to be more patronised than hitherto, as, according to his ideas, good, useful discussions often arose by means of its agency.

The Society's lantern being now ready, the PRESIDENT called upon Mr. Atkins to exhibit the competition slides. There were eight competitors—six slides each, which were of excellent quality, and were afterwards arranged in the inclined frame, so as to be judged, against a white paper backing, when the award fell to Mr. T. G. Hibbert for the first place, and Mr. Shields for the second, the voting being by non-competitors present.

Respecting the shape of the masks of these slides, it was noticeable in how many cases the usual cushion and circle had given place to an oblong form (especially when reduced in the camera), by which the whole or most of the original composition had been retained.

The meeting then adjourned.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting of this Society was held at the Greyhound Hotel, Dulwich, on Wednesday evening, February 2,—Mr. Larcombe in the chair.

Mr. W. W. WALKER introduced for discussion *The Properties of Chloride of Silver and its Adaptability for Photographic Printing*. After describing the various chloride of silver papers at present in use, and their method of manufacture, Mr. Walker referred to the recent introduction of collodio-chloride papers, and pointed out the advantage of finding some suitable substitute for albumen as a coating for silver paper. The introduction of the subject was followed by an animated discussion, in which most of the members joined.

It was decided that the next meeting, of February 16, should be devoted to an exhibition of lantern slides made by the members, and a discussion on the methods of producing lantern transparencies.

PACIFIC COAST AMATEUR PHOTOGRAPHIC ASSOCIATION.

To the lives of most persons come seasons of peculiar satisfaction and days of success, and the same thing occurs in the existence of societies; such was the experience of the above Association on Thursday evening, the 6th ultimo, the date of its regular monthly meeting, when the large attendance at its pleasant rooms showed the general interest felt in its affairs, and put the Directors to thinking how much of an appropriation would have to be made to the Furniture Fund for purchases of additional chairs. The evening was one of the most pleasant of many happy hours spent in the rooms, yet with all the good feeling there was a shadow of sadness, for one chair that was wont to be occupied by one of our most loved members, Mr. Virgil Williams, was vacant. Taken from our midst since our last meeting by a sudden and unexpected death, our Association has been deprived of a genial friend whose kindly counsels and artistic promptings have been most invaluable. Mr. Williams was the Director and moving spirit of our School of Design, and was well known both here and in the city of Boston, where for a while he had his studio, and we doubt that among our artists there was one who was more thoroughly acquainted with the history and technique of art in all schools of its existence. Eloquent and feeling tributes to his memory were paid by Mr. Treat, ably supplemented by Mr. Le Breton.

The feature of the evening was a lecture by Mr. H. S. Bellsmith (who is visiting this Coast in the interests of the Eastman Company) on *The Use of Bromide Paper in Contact Printing and in Enlargements*; and his concise and intelligent remarks, illustrated by numerous specimens of enlargements, in size up to 24x30, were listened to with marked interest, and called forth many inquiries and much admiration.

Mr. BELLSMITH said that he had nowhere in any of the societies he had visited seen such good specimens of bromide work as in the rooms of this Association.

After the active work of the evening, Mr. Le Breton invited those present to visit his luxuriously-furnished rooms in the same building, to test the effect of a new developer (of good feeling); it was of a light straw colour, pleasant to the eye, and was contained in a Japanese bowl on a table, and had to be kept cool with ice, and was measured out with a ladle; a little more or less seemed to make no difference, though more intense feelings were produced by a second application of the same strength. It was voted to be more of a success than the new restrainer (Beer) that the English journals are recommending.

This to show you we are not asleep on the Pacific Coast.

Correspondence.

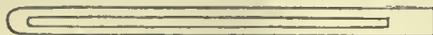
FEBRUARY MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE.—PRESENTATION OF BURNT-IN PROOFS ON CHINAWARE.—A CLEARING SOLUTION COMPOSED BY M. BESCH.—AN EXCELLENT ADDITION TO THE CAMERA LEGS OR STAND BY M. BRETON.—HOW TO CURE BLISTERS IN ALBUMENISED PAPER BY A MEMBER.—A DARK-ROOM LANTERN WITH HOT-WATER POT BY M. TONDEUR.—A CAMERA SLIDE BY M. SAURET.—PHOTOGRAPHING A RIFLE BALL MOVING AT A RATE OF 440 METRES PER SECOND.—ON COLOUR ADDED TO GELATINO-BROMIDE OF SILVER EMULSIONS, ISOCHROMATIC, ORTHOCHROMATIC, OR OTHERS.—M. VIDAL ON EASTMAN'S PAPER.

THE Photographic Society of France held their February meeting on Friday evening last, the 4th instant, M. Davanne in the chair.

M. Pinel Peschardiere presented some very fine specimens of burnt-in proofs on china ware. This gentleman has been experimenting a number of years to obtain a sure and certain means of decorating china, earthenware, &c., and at a cheap rate, by means of photo-lithography.

M. Besch presented a solution composed by himself to prevent fog, or, more correctly speaking, to clear negatives from fog. He was informed by the Secretary that many chemicals had that property, and that it was not likely that a secret process would be chosen when so many were already on hand.

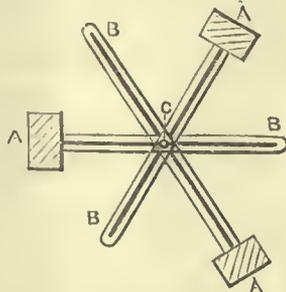
M. Breton, an amateur, said he had very often been in great trouble



Piece of grooved wood.



Camera legs with addition.



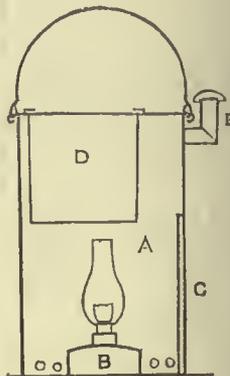
A A A. Camera legs. B B B. Grooved wood. C. Central bolt.

when reproducing pictures in museums to keep his camera stand from slipping on the waxed floors. He had at last completely conquered that

difficulty by a very simple contrivance, "which," said he, "I am very happy to give to the members of the Society, if, peradventure, any of them experience the same difficulty." M. Breton then presented an ordinary three-legged stand. When this was opened a supplementary piece of wood, with a long groove in the middle, was seen attached to each branch by means of a brass hinge; these three pieces of wood were then lowered down and crossed each other exactly in the centre of the leg or stand, that is to say, half-way between the camera and the ground; a bolt was then put into the grooves, and when screwed down held the stand very firmly. By loosening the bolt the three pieces of wood slide one upon the other, so as to give any position whatever to the stand or legs; when the proper position is obtained, the bolt is screwed tight, and the leg or stand cannot slip or move. I try to describe this dodge a little more than necessary, seeing how simple it is, because in my estimation it would be a good addition to every sliding leg in the market, as it doubles its power of resistance.

A member said that he had succeeded admirably in curing blisters on albumenised paper by submerging the prints before toning in the following bath:—

Table with 2 columns: Substance and Quantity. Water: 400 parts. Alum: 40.



A. Body of lantern. B. Lamp. C. Red glass door. D. Hot water pot. E. Chimney. F. Handle.

M. Tondeur presented a lantern for the laboratory, to which he had adapted a hot-water apparatus to keep emulsions liquid during the preparation of gelatino-bromide of silver plates. A carpenter's glue-pot would give a good idea of this lantern. It might render service to amateurs and photographers who still prepare their own plates, so I send on a drawing.

M. Sauret exhibited a camera slide, which he certified would not let any rays of light penetrate and spoil the plates. This he obtained by means of a piece of wood, covered with cloth, pushed forward by means of a spring. Here a very sad discussion took place between the inventor and M. Mackenstein as to priority—patriotic sentiments came uppermost, and hard words were said to M. Mackenstein, he being a foreigner.

An amateur of Pesth has been experimenting on the rapidity of gelatino-bromide of silver preparation, and it is said that he has succeeded in photographing the ball from a rifle during the trajectory which it described on leaving the muzzle of the rifle. The experiment was made with the Werndl rifle. It appears that the plate reproduced the ball when moving at a velocity of 440 metres per second. The ball is represented as surrounded by air taking an hyperbolic form.

A discussion took place upon isochromatic preparations. M. Tailfer claimed the honour for France, his establishment, he said, being the first to prepare them.

This subject, I think, ought to be cleared up at last—so many are in the field at present as the inventors, &c. An international jury might be nominated to study the subject, hear evidence if necessary—either written or verbal—give judgment, and so honour may be given to whom honour is due. My opinion coincides with that of many; that no patent whatever can prevent a colour to be added to an emulsion, as this has been done to my knowledge since 1877. At that period I made a great number of gelatino-bromide of silver plates, the emulsion of which was tinted with cosine or some other colouring matter. These plates were bespoken by M. Ducos du Haurou; he supplied the colouring substance. I am surprised that an English house should cease adding a colour to their emulsion on account of a patent. That Herr Vogel, of Berlin, prosecutes any one taking the name of orthochromatic plates, or M. Tailfer, of Paris, does the same in the defence of his title, well and good, but to go further encroaches upon public liberty, and this must be tolerated no longer.

M. Vidal gave a description to the Society of his experiments on Eastman's paper. He took an over-intense enlargement and plunged it into a solution of bichloride of copper, twelve per cent.; after well washing the paper, from which the image had disappeared, it was laid in a feeble bath of sulphocyanide of potassium, then in the developing bath; the image was renewed, and had obtained its proper degree of intensity.

44, Rue des Moines, Paris.

Prof. E. STEBBING.

A HOME FOR THE PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—During a recent meeting of a scientific society at Burlington House, I was forcibly struck by the advantage in every way it would be to the Photographic Society, and to photography generally, to possess a house of its own, or a set of rooms at least; and now I see, by your paper of last week, that the worthy President of the Photographic Society has broached the subject. I hope the matter will not be allowed to drop. I should say the Society meets as often, and its meetings are as

well attended, as those of the societies which are so handsomely provided for in Burlington House. Photography, it seems to me, has equal claims to such recognition, for is not its use required in almost every pursuit, whether scientific or not? An establishment of its own would give the Society an impetus and enlarge its sphere of usefulness.—I am, yours, &c.,
Beckenham, February 7, 1887. J. C. S.

BURNLEY EXHIBITION.

To the Editors.

GENTLEMEN,—Will you permit me, through your columns, on behalf of the Burnley and District Amateur Photographic Society, to thank most cordially those gentlemen who so kindly and courteously responded to my appeal for exhibits for our Exhibition which has recently closed? It was very gratifying to receive so many contributions from both amateur and professional photographers from all parts of the kingdom, as it exhibited what a great amount of camaraderie exists amongst the brethren of the art, as our Society must have been almost unknown to them. I trust all received their exhibits on return in such a state as will warrant my being able to make a like appeal without fear of refusal.—I am, yours, &c.,
7, Bank Hall-terrace, Burnley. WILLIAM SUTCLIFFE, Hon. Sec.

PHOTOGRAPHY IN INDIA.

To the Editors.

GENTLEMEN,—The old Bengal Photographic Society of former years has probably figured in these pages as the leading Society in the East, but owing to the difficulties of getting apparatus, &c., and the want of energy on the part of the members as a body, it eventually died a natural death.

Thanks, however, to modern facilities and the increased number of amateurs, a proposal was made in March, 1886, to revive the Society under the title of the Photographic Society of India. The difficulties of collecting a working Committee out here are far greater than at home, chiefly owing to the effect of the climate, which, excepting the very short period of three months, is commonly called "purgatory." However, by dint of exertion the list of members has increased, and is not far short of a hundred members just now.

Our general meetings have been well attended, and the latest arrival from home is anxiously looked to for an account of the latest inventions. Shutters of all sorts have had their share of attention, and some of the latest patterns, such as the "Grimston," are considered wonderful for ingenuity, though the ordinary drop shutter can boast of the best results in difficult work as far as the Society is concerned. Though we may be behind the times, we wish to follow on as fast as possible, and to this end we want samples of the rapid printing papers which appear to be so much used in England. Messrs. Eastman's papers have found their way here and are very highly thought of, though a trial of keeping them through last rains proved too severe. Of course the papers I refer to were not sealed up in tin, which would have effectually preserved them. While on this subject, I would suggest that all papers sent to India should be sealed up in small quantities, for dealers here must clear out old stock, and after a few months of damp there is great risk in purchasing on the spot. The platinotype process is worked by many, but for the greater portion of the year it is almost impossible to get satisfactory results, owing to damp. Paper negatives have been carefully tried and are well thought of, but the slight extra trouble necessitated in working goes much against them in a country where one has so little inclination to exert oneself. Roller slides are by no means uncommon here, but we are all troubled with the want of an index on the outside of the case. Generally speaking, the number of amateurs who do their own silver printing is very small, but professional assistance has been most cordially given to members.

An exhibition, open to all, was proposed last year, but the funds of the Society being an important point, it has been decided to postpone it till January, 1888, when we hope to gather together a goodly collection of pictures from all parts of the world. Further information on this point will be sent out in a few months.

As Secretary to the Society, I beg to invite photographic dealers to forward us lists of novelties, and as before stated we are very anxious to get out samples of the new printing processes. Unfortunately, as yet, we have no home agent to refer to, and we scarcely know where to apply for samples. Dealers here will not order them out on chance, and until the Society has given them a trial they will still remain unknown in Calcutta.

Of our prospects we are still uncertain; the Society has lived a year and flourishes, and under the able presidency of Colonel Waterhouse we have every reason to look forward to a long life. Before long we propose to exchange Oriental views with Societies at home, and as soon as we can run to a Society lantern we shall be pleased to participate in the friendly exchange of slides which has been arranged between England and America.

I have only further to say that we shall be very glad to have advice regarding the proposed exhibition, and obliged for any assistance from our distant friends.—I am, yours, &c.,
JOHN S. GLADSTONE,

Hon. Secretary of the Photographic Society of India.

8, Clive-street, Calcutta, January 11, 1887.

HALATION.

To the Editors.

GENTLEMEN,—Some people seem to have very vague notions as to the cause of so-called halation which sometimes appears in paper negatives. The interior of a church, say, is taken on an embossed glass plate, and in the resulting negative it will be found that, though the details of the windows are all sharply and exactly depicted, still the whole of each window is enveloped in a fog caused by the reflection of the light from the back surface of the glass. This defect may be overcome by reducing the fogged portion by any of the usual methods; but I have found that by far the best plan is to give the windows a further printing under a vignette. Now if a sensitive film on a paper support be exposed on the same subject it will be found that the outlines of the leading and other dark portions are quite destroyed, in some cases even the leading being entirely obliterated, the surrounding high lights being merged together into one mass. Now this is caused by the diffusion or spreading of the light through the white substance of the paper, and though more local than halation in a glass negative, is far more destructive in its effects, as nothing short of a pencil can restore the lost details. I have never noticed anything of the sort excepting in the case of very long exposures.—I am, yours, &c.,
H. A. LEWIS.

Binsted, Arundel, February 7, 1887.

YELLOW STAINS ON NEGATIVES.

To the Editors.

GENTLEMEN,—I can hardly agree with your correspondent, "J. G. R.," respecting the advantage of the yellow stain in negatives. It certainly does not much matter where it is but slight, but where it is of a brownish yellow colour, like mine was, the time taken in getting a print may be reckoned by days.

It may be of some service to your readers to know that this stain may, to a considerable extent, be removed by a solution of oxalic acid. Having used a strong solution for removing stains upon my hands caused when developing, it occurred to me that a weak solution might remove the colour from the negatives. I tried it, and found that it discharged the denser part of the colour, leaving the negatives a pale yellow tint. As might be expected, it produces frilling, and must be used with caution.—I am, yours, &c.,
G. SMITH.

Dudley, February 8, 1887.

DEFECTIVE MOUNTS.

To the Editors.

GENTLEMEN,—I take the liberty of sending you a sample of mounting board taken from a stock we have just lately had delivered. I was very much surprised to notice that when damped in the process of mounting photographs on them such a smell of sour paste was evolved as to make it almost unbearable in the workroom. On further examination I found them to be very acid. The boards I usually use have no such smell, and fancying something was wrong I complained to the firm who supplied them. The reply they give still more astonishes me. They say, "The makers state the boards are perfectly good, and have never before had a complaint, though we have made boards of the same quality for over thirty years."

Now, Gentlemen, so much has of late been said and written about the fading of photographs, that I am inclined to think the fading of silver prints may to a great extent be accounted for by boards such as I now complain of finding their way into the market. I cannot understand how silver prints coming into contact with such an acid substance can stand for any time. I should be much indebted to you for your opinion, and if you consider it would be safe to mount silver prints on boards such as I send you the sample of.—I am, yours, &c.,
JOHN STUART.

120, Buchanan-street, Glasgow, February 4, 1887.

[The paste employed in making the board has probably been sour. Such would be fatal for silver prints.—EDS.]

Exchange Column.

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

Will exchange luxograph lamp for whole-plate group lens.—Address, BERLIN STUDIO, 440, Old Kent-road.

I will give a cottage barrel-organ, eight tunes, or a good head-rest, for Lancaster's 12 x 10 view lens.—Address, W. SAUNDERS, Dickleburgh, Soole.

Wanted to exchange, gem camera and six lenses for studio camera, stand, or interior background.—Address, A. J. B., 17, Ifindon-street, Pimlico.

Will exchange pair of buffalo horns, mounted (six feet), for half-plate camera (square), with latest improvement, double slides, and good view or portrait lens. Cash differences.—Address, HUDSON, Godmanchester, Hunts.

will exchange a Ross' No. 3 C.-D.-V. lens for a rapid symmetrical, difference in value adjusted; also a posing chair with four backs for a portable camera and double slides.—Address, W. T. WHETTER, Photographer, Villiers-road, Bristol.

Quarter-plate Starnes's camera, with Newton's 5 × 4 rapid rectilinear lens; will exchange it for pair of Ross' or Dallmeyer's quick-acting stereoscopic lenses or whole-plate rectilinear.—Address, BONA VISTA, care of Myles, Uddingston, Lanarkshire.

Will exchange portable 10 × 8 camera, with double and single slide, by Meagher, for 10 × 8 or whole-plate universal studio camera and slides; also another 10 × 8 camera and slide, two quarter-plate portrait lenses, and tripod stand, for studio accessories or backgrounds.—Address, WALTER DAWSON, Waring Green, Brighouse.

Will exchange Seavey's backgrounds for others by same artist; also garden seat, fireplace, rockwork, cottage, Eclipse shutter, and a Ross' cabinet portrait lens. Wanted, a 12 × 10 camera, three slides; also quarter or half-plate ditto, 12 × 10 wide-angle lens, enlarging lantern, or Haddon Hall steps, &c.—Address, F. WHALEY, Photographer, Lincoln.

Chemical balance by Oertling, modern make, fourteen-inch beam, agate planes and knife edges throughout, with double rider apparatus, specific gravity pan, and all adjustments, in handsome mahogany case with counterpoised sliding front, two drawers, and lock and key; in perfect condition and adjustment; cost £18 18s. Will exchange for tricycle by good maker; central-gear Premier or cripper form preferred.—Address, CHEMIST, 2, York-street, Covent Garden, W.C.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

J. C. S.—The Ross' portable symmetrical of six inches focus will serve the purpose.

J. T.—The incandescent burner referred to is not yet an article of commerce in this country.

W. C. B.—There is no restriction upon the employment of two plates side by side in a dark slide.

COPYIST.—Stop out everything in the group by means of Chinese white, except the one figure, of course.

FOCUS.—We have not yet been able to ascertain the precise cost, but it will probably be from 1s. 6d. to 3s.

F. W.—Before purchasing any other lenses try a component of one of the "rapids" as a single lens, using an aperture of about $\frac{1}{16}$.

W. EMPSALL.—If you state the circumstances under which the dark room has become damp we will then be better able to indicate a remedy.

O. X.—The mottling on the plates arises from the emulsion being imperfectly washed, hence the haloid salts have crystallised out as the plates dried.

A. B.—The electric light is now employed at all demonstrations in the Society of Arts, and it is that belonging to the Society. Your letter will be submitted to the officer in charge.

E. D.—1. Possibly the lack of density is due to the negatives being under exposed. If this be not the cause use more pyro in the developer.—2. If the two lenses be employed with apertures of the same ratios the exposures will be practically the same.

C. J. E.—This matter can only be determined by actual comparative experiment. If the compound lens does not define to the edges without a small stop, it may probably give a flare-spot in the centre. If it does so, this indicates that a preference should be given to the single lens.

CARBON writes: "I have some cabinet negatives I wish to print in carbon (single transfer); is there any method by which I can get reversed negatives without getting a transparency of each?"—Yes, reversed negatives can be made direct from the originals by the powder process; or they may, with some brands of dry plates, be made by taking advantage of the reversing action of light obtained by a long exposure.

W. B. WOOD.—The rays should fall upon the graphoscope lens as nearly in a parallel direction as possible; hence it must be placed a considerable distance from the condensing lenses, or, to speak more correctly, it must be made one of the elements of the condensers, although far apart from them. Possibly it will prove more satisfactory if you try the system in which a ground-glass backing for the negative is recommended.

POISONS writes: "Kindly inform me, through your 'Answers to Correspondents,' if I make myself liable to be proceeded against under the Poisons Act for selling chemicals to amateur photographers?"—If the chemicals be any of the poisons mentioned in the Schedule, such as cyanide of potassium, bichloride of mercury, &c., of course our correspondent renders himself liable to a penalty. If the chemicals supplied are not poisons no harm is done.

A. B. CLARKE writes: "I have been using lately the developing formula described on page 141 of this year's ALMANAC, but I find such a tendency to frilling that I never found with the ammonia developer; am still using the same make of plates. Do you think the soda solution too strong is the cause of the frilling?"—It is quite possible that the frilling proceeds from the cause suggested. See an article on the subject by Mr. H. W. Gridley on page 200 of the ALMANAC.

J. T. ANDERTON says: "I have a quantity of cabinet carbon prints which I wish to mount, but as they are thicker and much more glossy than silver prints, I fear the ordinary starch mountant will not be strong enough unless the prints are damped, in which case the enamel-like surface will be spoiled. Can you tell me how to proceed so that their beauty may remain unimpaired?"—The prints need not be wetted if thick starch paste be used. Or, in place of starch, a thin solution of glue may be employed.

GEORGIUS puts the following questions: "1. My toning bath gets rather black although I filter it. Is there any way of making it clear? Is this discolouration harmful in any way?—2. How long should a toning bath last if strengthened from time to time with gold and acetate of soda?—3. What do you recommend for keeping the smooth bar of a burnisher in order?"—1. The discolouration arises from some of the gold becoming reduced. When out of use the solution should be kept in the dark. The discolouration will do no harm except that so much gold is wasted.—2. For many months.—3. A perfectly flat oilstone.

J. WHYTE puts the following queries: "1. Where can I be supplied with photo-lithographic transfer paper, i.e., paper coated with gelatine but not sensitised with bichromate?—2. Does any firm in London prepare for the trade a heavy tissue suited for Woodbury reliefs that may be moulded from or electro deposited upon for photo-topographic blocks, and please name the firm?"—In reply: 1. Photo-lithographic transfer paper is supplied by Mr. E. Liesegang, Düsseldorf, Germany.—2. Those who work the Woodbury and analogous processes make their own tissue. Perhaps the Autotype Company can supply a suitable article.

A. H. D. writes: "I have some oil paintings to photograph, and large prints are required, would you suggest, 1. That I take them on quarter-plates and enlarge on Eastman's paper, or can you propose a better plan?—2. Is no special treatment of the paintings required in order to secure good results?—3. Do you recommend the use of orthochromatic plates for this purpose?"—In reply: 1. The best plan will be to copy the paintings direct the size required and then to print from the negatives.—2. All will depend upon the paintings themselves; sometimes they require special treatment, but not always. A little glycerine rubbed over the surface will often enable better copies to be obtained.—3. Certainly.—4. We never recommend any particular maker's goods. That is strictly against our rule.

A. B. writes: "Will you kindly say what sizing compound is used in preparing the paper for photo-lithographic transfers, and whether it is applied before coating with gelatine or after development of the inked print? The reason of our question is because of the tendency of our prints to slip on the stone while under pressure, through want of tackiness, the original sizing of the paper being washed out during development. Could you also tell us if a paper prepared for this purpose is to be found in the market?"—Different photo-lithographers have different methods of preparing their transfer paper. Usually it is a fine paper coated with gelatine only; sometimes albumenised paper is used. The slipping, we imagine, is due to want of skill in the operation of transferring. Better get a few lessons from a practical lithographer in transferring. See reply to "J. Whyte."

ORNAMENT writes: "A friend of mine is getting up a little ornamental article for the Jubilee year, and the ornamentation consists of an emblematic portrait of the Queen surrounded by some important events of her reign. The engraver has taken his likeness (only) from a copyright photograph, the other portions are original. Will you tell me if this is an infringement of the Copyright Act? The article would in no way interfere with the sale of the photograph, being altogether a distinct thing."—If the engraving be made from a copyright photograph, of course it is an infringement, and the pirate renders himself liable to the penalties, namely, ten pounds for every copy issued as well as forfeiture of the plate. It matters not whether the pirated copies will interfere with the sale of the originals or not. If the owner of the copyright chooses to take proceedings he can recover the penalties.

The next meeting of the North London Photographic Society will be held in Myddelton Hall, Upper-street, on Tuesday next, the 15th instant. Subject: *The Characteristics of the Photographic Lenses in Daily Use*, by J. Traill Taylor. All are invited.

PHOTOGRAPHIC CLUB, Anderton's Hotel, Fleet-street, E.C.—The subject for discussion at the next meeting of this Club, Wednesday, February 16, 1887, will be adjourned discussion on *The Art Treatment of Photography*, with a demonstration by Mr. Norman Macbeth, R.S.A.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday next a demonstration will be given by Mr. J. Hubert on the toning of collodion-chloride prints and the application of the process to the making of lantern transparencies and the reproduction of negatives.

** We have again unfortunately been compelled to leave over some "Exchanges," Mr. Berkeley's communication, and several other important articles, but hope to have space for their insertion next week.

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DRYING AND MOUNTING GELATINO-CHLORIDE PRINTS.

ATTENTION has been called to the fact that no mention was made in our recent articles on *Gelatino-Chloride Paper*, of the drying and mounting of the finished prints; and as these operations differ sufficiently from the usual practice with albumenised paper to raise rather serious difficulties in the way of beginners, we have pleasure in supplementing our previous remarks by the following hints.

In the course of the articles referred to it was pointed out that, owing to the nature of the sensitive surface of the gelatino-chloride paper, it was impossible to employ warm solutions or to dry the prints by heat; in addition to this, owing to the more or less adhesive character of the surface, the use of blotting pads for hastening the drying is *contra* indicated. These circumstances may at first sight raise a vision of difficulties which do not really exist.

We will suppose the prints have passed through the toning and fixing baths and have been thoroughly washed, the next operation—and it is a most important one—is to immerse them in the “hardening” bath of ordinary or chrome alum. This not only helps to protect the surface of the finished and mounted print from subsequent injury, but it also greatly facilitates the remaining operations of drying, mounting, enamelling, rolling, &c., by rendering the surface less adhesive while wet, and harder and more like albumen when dry. An immersion of five minutes in a saturated solution of common alum, followed by a rinse for a minute or two in clean water, suffices for most purposes; but if an extremely hard and perfectly insoluble surface be required we prefer to employ chrome alum of the strength of five grains to the ounce, followed as before by a final washing. In using chrome alum care should be taken that the solution is not strong enough nor the immersion sufficiently prolonged to stain or degrade the lights of the picture.

Having arrived at this stage, the prints are ready for drying by the method usually recommended, namely, squeegeeing on to glass or ebonite; or they may be dried like ordinary prints by simply hanging, in which case, of course, the surface will not possess so much glaze as in the former. In order to produce the high gloss a sheet of plate glass is most thoroughly cleaned with a paste of tripoli or whiting and ammonia, and then carefully polished with a silk handkerchief. It is then prepared for the “transfer” process by a further polish with a weak solution of wax in perfectly pure benzole, or with powdered talc. If the former be employed, a little of the solution should be poured on to the plate, quickly rubbed over the whole surface, and finally gently but thoroughly polished with a silk handkerchief, until no apparent trace of wax is left. This is

an operation which requires some experience, as if too much wax be left on the plate the print will strip with an uneven surface, while if the polishing be too *violently* performed and the wax completely removed, it will not strip at all, but remain firmly adhesive to the glass.

Most operators now prefer to use powdered talc which is easier of application, and will bear any amount of polishing off. The plates should be allowed to rest for some time after polishing and before use, in order to allow the electrical excitement to subside; they are then carefully dusted with a soft brush or clean silk handkerchief, and are then ready for use.

The only requisites in the next operation are a porcelain dish of suitable size, a squeegee, and some clean water. A sheet of indiarubber cloth a little larger than the prints to be operated upon will be found an additional convenience, and costs but little; the squeegee may be purchased in various sizes at most photographic dealers, and is also inexpensive, or it may be made by screwing a strip of sheet indiarubber, about an eighth of an inch thick, between two pieces of wood to stiffen it, leaving about a quarter of an inch of its width projecting. A smooth edge may be given to it by working or grinding it after mounting upon a flat stone with a little emery or fine sand.

All being ready for mounting, let one of the prepared glasses be laid, polished side uppermost, in the dish of perfectly clean cold water; the print is then plunged face downwards into the water, and one edge being brought into contact with the corresponding edge of the glass plate, and the two clamped together with the thumb and forefinger of each hand, they are slowly drawn from the dish in perfect and intimate adhesion. The plate with its attached print is then laid upon a flat surface, the indiarubber cloth placed over it and held firmly by the edge with the left hand, whilst with the right the squeegee is passed, at first gently, and afterwards more firmly, over the whole surface, so as to press out as much as possible of the water contained in the body of the print, and between it and the glass. Unless the glass be much larger than the print, the rubber cloth should be held firmly against the table and clear of the glass, but in any case the fingers of the left hand must not rest upon the print. The mounted print may now be reared up in a cool place to become dry.

We have hitherto spoken only of glass for the purpose of mounting for drying, but other materials may be used, and are preferred by some; glass, however, gives the finest surface, if that be an object. Where a slightly lower glaze will suffice or is preferred, thin sheet ebonite or ferrotype plates may be substituted, the preliminary treatment being exactly similar to that given to glass. Sheet xylonite or celluloid has been

recommended, but this we have never tried, though we have no doubt as to its efficacy, and it is susceptible of a very high polish. These substances, especially ebonite, permit the stripping of the dried print more easily and with greater safety than glass, for which reason alone they are worth a trial.

IN *La Nature* of the 12th instant will be found an engraving of a remarkable photograph—a view taken from a distance of over one hundred miles from the objects by Messrs. Émile Courvoisier and Charles Humbert. These gentlemen had often, fruitlessly, endeavoured to obtain such a view; but at last success crowned their efforts, and the negative they obtained, if it be anything like the engraving, must be looked upon as a feat of photography. They had often desired to possess a panoramic view of the Alps, which should be more exact than the usual lithographs, and more than once they tried photographing in full daylight, but not a trace of the brilliantly-illuminated mountains could be perceived; sky and mountains were merged into one flat tint. It then occurred to them to take a view a little before sunrise, and, after several trials, they succeeded in obtaining a satisfactory negative, with an exposure of fifty or sixty seconds. The actual distances of the elevations depicted are—Jungfrau one hundred and five, and Weisshorn one hundred and thirty kilometres. We think that their claim to have produced a view such as had never before been done will be allowed by all.

AN electric battery always ready for use, and capable, with a few cells, of giving sufficient current for the illumination of a good glow-lamp, is still a *desideratum*. There are cells, like the Leclanché, always ready for use, but requiring an immense number to produce a small light, and cells like the bichromate, which give an excellent light with a small battery only but which rapidly run out, and there are all kinds between the two. We would draw the attention of our readers who, for photo-micrographic or dark-room purposes require such a lamp, to an article in the *Chemical News* over the signature, H. N. Warren, R.A. He has invented a battery, which he states he has found to be the most powerful yet examined. Taking a cell of the bichromate pattern, he replaces the usual exciting liquid by a slightly acidified strong solution of chloride of iron, with a layer of bromine at the bottom of the cell. Ferric chloride being very soluble, a much stronger solution at the outset may be obtained; and it is kept up to strength, as the zinc is acted upon, by reason of the recuperating action of the bromine, which, as the ferrous chloride forms, reconverts it into the original ferric form. The bromine itself, as it becomes absorbed in this process, may be brought back to its original condition by adding a little bleaching powder solution. Mr. Warren states that the strength of the battery is only slightly reduced after three hours' continuous action, and that after a little rest it recovers its original power. If all that is thus claimed should turn out to be as stated, such a battery ought almost to revolutionise electric lighting by battery on a small scale.

We are again promised cheap sodium, which, as our readers are aware, means cheap magnesium, aluminium, &c., and this time with a show of certainty. It is announced that Mr. Castner, of Belvedere-road, Lambeth, will give a full account of the process before the Society of Chemical Industry on the fifth of next month. He uses a compound of iron and pitch coked together as the reducing agent, the operation being performed in large steel crucibles. It is stated that a quantity of caustic soda costing about fourpence is capable of giving, with the expenditure of a shilling, one pound of metallic sodium, now worth about eight or nine shillings. If this news prove to be true, magnesium should be producible at such a price as to render its use in the studio a matter of the most trivial expense, while the introduction of cheap aluminium would revolutionise the mounting of lenses and many other photographic requirements. We have already described on previous occasions the Cowles method of producing the last-named metal and its alloys by means of the electrical furnace, which is now in full work in America, and we learn that a still larger machine of a similar character is being made for use in this country, the combined engines for which will represent a total of about three thousand horse-power.

A *SUITABLE finale* to the transport and safe receipt of the great lenses for the Lick telescope is found in a description which we read of the last resting-place of the munificent founder of the telescope and observatory. His body was formally transferred to the custody of the trustees on a recent Saturday evening, the coffin remaining in a room in the observatory during the night. On Sunday an address was read by the President of the observatory, and the coffin was lowered into a cavity in the foundation pier of the great telescope and permanently built in.

WITH regard to Schott's optical glass, which is now attracting so much attention, we note that our contemporary, the *English Mechanic*, is giving a complete list of the various kinds made, with a translation of the descriptions, in German, which head each column. The list will, no doubt, be extremely useful to those amateurs who attempt lens grinding; but this is an operation attempted by few photographic workers, though for microscopic and telescopic objective construction there are many amateurs of first-class ability in this country. As bearing upon our previous remarks on the subject, we may observe that some of the glass tabulated is described as suitable to be used only where there is no dampness nor contact with water. Some of it, further, is "not very hard," other termed "soft," while other, still, cannot be made free from bubbles.

IN *Nature* last week will be found an elaborate article on "Instantaneous Shutters" for photographic use. The whole subject is well thought out, and the possible practicable efficiency of shutters constructed upon different principles is mathematically calculated. Circular and rectilinear apertures are both treated of, and the general conclusions arrived at are summarised at the end of the article. They are as follows:—(1), That there is room for great improvement in the photographic efficiency of shutters; (2), that all the ordinary kinds shake the camera when the exposure is rapid; but that (3), for comparatively long exposure, say more than one-tenth of a second, almost any kind of shutter will do when the camera is mounted on a stand; and (4), that for cameras which are to be held in the hand, in order to secure fine definition, the shutters must be dynamically balanced or exceedingly light."

ACCESSORIES OF THE LANTERN.

CHAPTER III.—SCREENS.

SCREENS may be divided into two classes, translucent and reflecting. Translucent screens were formerly in general use, the sheet being placed between the lantern and the audience, whereas now, in nineteen cases out of twenty, the lantern is situated on the same side of the screen as the audience, so that the image is seen by reflected light only.

Translucent screens usually consist of linen, rendered semi-transparent by a temporary wetting. In screens of this class above ten feet square there is usually a dark line across the pictures during an exhibition, which is caused by the necessary joining of the fabric, as it is not manufactured wider than ten feet without seam. This objectionable line may be reduced to a minimum by joining with "carpet stitch," by which any overlapping of the edges is avoided. Another defect of the wetted screens is the brilliant spot of light which is caused by the rays from the lantern passing straight through the screen without diffusion, owing to the minute interstices in the linen; a third fault is a great loss of light; a fourth, the limited space usually available behind the screen renders the use of very short focus lenses imperative, thus producing inferior definition. These matters have caused the plan of showing through the screen to go quite out of fashion, especially as there is now nothing to be gained by the concealment of the lantern, which was necessary for the phantasmagoria illusions. A translucent screen for small discs is easily made by pasting a large sheet of tissue or tracing paper over a child's hoop or other framework. This screen will not require wetting, as the material is already sufficiently transparent.

Reflecting screens may be made quite opaque; a smooth-plastered wall which has been newly whitewashed makes a first-class reflecting surface, and one that is difficult to surpass. It is obviously not a

convenient screen to travel about with, but where lantern exhibitions are constantly being given in one place, and the hall is suitable, it is perhaps the best plan that can be devised. Such a screen will reflect about thirty per cent. more light than an ordinary linen sheet, and will show the colours of slides in their full beauty. The difference of quality between pictures shown on a perfect surface and those exhibited on an ordinary screen, especially if the latter is slightly yellow in tint, is greater than might be supposed; there is a beauty and freshness about the former which is not observed in the latter.

Paper screens are excellent when new. A cotton sheet may be pasted over with white paper, and fitted with a roller and strong lath, like a school map. It will hang at first very flat, though if any sharp creases are produced they are troublesome to remove, hence such a screen requires careful usage, and should not exceed ten feet square in size. When soiled they are rendered as good as new by repapering. If a screen of this class is made over ten feet in length, it is not handy to travel about with, as the luggage vans on the passenger trains do not always admit a greater length than this. Where a large screen is wanted for one particular hall, a paper-covered one answers admirably. There is such a screen, about twenty feet square, arranged to roll up like a theatrical drop-scene in the main hall of a school at Burley-in-Wharfedale. This, by-the-way, is the model school of the late Right Hon. W. E. Forster, in whose presence about four years ago I had the pleasure of exhibiting and describing lantern views at two of the annual "breaks-up." Mr. Forster seemed then in excellent health and spirits, and determined that he and others should enjoy themselves; he was hearty in his manner, and very popular in the school and district. The large screen referred to was let down in a few seconds, and saved a good deal of time that might otherwise have been expended in stretching a linen sheet in the usual way.

A screen about six feet square may be made without any pasting by a sheet of stout white drawing paper, which is sold of a considerable width at the artists' material dealers; it should be fitted with roller and lath so that it may be rolled up without creases.

The size of a screen is an important consideration, and depends more upon the dimensions of the hall than on the intensity of the light. If a screen is too large for the hall, the audience will be unable to appreciate the beauty of a picture shown thereon as a whole—their attention will be directed to the details only, and in such a case the defects of the picture—dust, spots, and brush marks—will be painfully apparent. If the screen is too small, the picture, being viewed by the bulk of the audience at too great a distance, appears insignificant. I have, in my own practice, found it a good rule to have the diameter of the disc equal to one-fourth of the length of the hall, thus: a fifteen-foot disc for a hall sixty feet long, a twenty-foot disc for a hall eighty feet long, and so on. The screen being at one end of the hall, the bulk of the audience will then view the pictures at a distance about equal to twice their diameter; they are then near enough to see every detail of the pictures if they are properly illuminated, while they are not close enough to discern clearly the microscopic defects which are present in nearly every slide.

It is instructive to note the different impressions produced on two persons by a lantern exhibition on a large scale, the one sitting near the screen and the other at a fair distance from it. I have known the former to be completely disgusted, while the latter was filled with admiration. A similar instance seems to have occurred lately at the Society of Arts Hall on January 6, where slides were shown by the electric light on a large screen. Mr. George Smith, seeing the pictures from too near a standpoint, becomes painfully conscious of the imperfections of the pictures, and straightway puts the blame on the light, and goes on to assert that the oil light is superior to the electric and even the limelight for projection! No doubt an arc light of over 1000 candles is more powerful than is necessary for an eighteen-foot disc, as a limelight of 600 candles would be amply sufficient; but if Mr. Smith had been a little further away from the screen I think he would not have expressed himself in such a manner. I am afraid if his customers were only allowed to use the oil light when displaying the excellent slides he manufactures that his business would suffer.

There are many halls in which the ceilings are whitewashed and the side walls very light coloured. In such a case the light proceeding from the image on the screen is reflected back, so as to render the room very light, and hence the picture may look misty. If there is

no ready means for partially protecting the screen from the light thus thrown back on it, it is advisable to adopt a small sized disc. The diffused light in the room will be the same in amount as before, but the superior brilliancy of the image on the smaller scale will to a large extent overpower the fogging action.

The position of a screen being usually at the extreme end of a hall, it should be raised sufficiently high to enable those who are at the opposite end of the room to see the lower part of the pictures; hence the lower edge of the sheet should be about four feet above the floor line. In the case of large halls, the height may be six feet, but it is not desirable to dislocate the necks of half the audience by making the pictures too high. The screen should, if possible, lean slightly forward at the top, so as to be "square" with a line extending from the lantern to the centre of the disc. By this means distortion of the pictures will be avoided, and the audience will see the pictures to the best advantage.

ALBERT WM. SCOTT.

ECHOES FROM THE SOCIETIES.

THAT was a rather curious experience of Mr. F. York's reported at a meeting of the London and Provincial Photographic Association, but it is scarcely susceptible of any useful explanation until the experiment has been repeated under clearly established conditions. Two negatives exposed at the same time were kept, before development, one in the dark slide, the other in paper, and the latter was stated to have been "accelerated" by contact with the paper. Two points, however, strike me. Nothing is said about the two plates having been accurately timed as to exposure, and it is possible that a slight difference in that respect, unnoticed perhaps at the time, may account for the effect; or the plates themselves, though from the same batch of emulsion, might, from a variety of causes, have differed slightly in sensitiveness. On the other hand, setting this view on one side, and granting the exposure and sensitiveness to have been identical in each case, the plate exposed more freely to the atmosphere in the dark slide than its companion wrapped in paper may have been "slowed." The final result would be the same, but with the same difference experienced by the Irishman who, having ordered a pair of boots, one of which was to be slightly larger than the other, complained subsequently that the shoemaker had misconstrued his instructions and made one *smaller* than the other. If Mr. York will repeat the experiment with the same kind of paper, making *one* exposure in the camera, and cutting the plate in halves, then covering a portion of one half with paper, and enclosing it between clean glass plates before wrapping it up, the result upon development will give us a definite point from which to start.

A few weeks ago I had to make allusion to orthochromatic photography, which still appears to absorb a great deal of interest, scarcely a meeting of importance being reported without some reference to the new development in our negative processes. But decidedly the simplest and most novel process is that of M. Theophil D'Haoûw, of Gand, described by Mr. W. H. Harrison at the London and Provincial Photographic Association. The process exhibits undoubted ingenuity, but in obtaining the results claimed I fancy M. D'Haoûw must draw largely on an imagination which in the first inception of the method has given evidence of a vast capacity for stretching.

We are told that M. D'Haoûw employs neither eosine nor yellow glass, but merely waits until twilight or until "the blue colours in the object found little blue incident light to throw off," hence a good orthochromatic effect is obtained. It is of course well known that at the close of the day the blue rays exist in comparatively small proportion to the yellow; it is also true that even the yellow or luminous rays are present in much smaller quantity than at midday. Any beginner in photography will be able to tell M. D'Haoûw that it is easy with a long exposure to photograph a blue object late in the evening when it is impossible to do anything with yellow, because the photographic action fades out of the yellow end of the spectrum far more rapidly as the light wanes than out of the blue. In true orthochromatic processes the sensitiveness of the plate to the yellow rays is increased while the blue sensitiveness is little, if at all, lowered. In M. D'Haoûw's method the blue rays are cut off or got rid of until they have little power to act, and without attempting in any way to

increase the sensitiveness of the plate to the already feeble yellow rays these are still more reduced in power, with the result, I should guess, that a diametrically opposite result to that euphemistically described as "a good orthochromatic scale" would be obtained. Certainly *quod non erat faciendum*.

When the general tendency in all quarters is to do away with the use of yellow screens in consequence of the lengthened exposures they necessitate, I can scarcely imagine that any one would seriously look at such a method even supposing it to be theoretically accurate. With all our great increase of sensitiveness in the past few years for many purposes, we are open yet to a still further and vast increase, notably in printing processes. A few days ago I particularly wanted a print from a certain negative for a special purpose. The negative was not a dense one by any means, though slightly yellow in the shadows; but after an exposure in the open air for the whole day the darkest shadows were sufficiently "out" to render visible a large insensitive patch hitherto unnoticed, which rendered it necessary to start afresh. If our experimentalists in orthochromatic photography would turn their attention to printing processes I venture to predict that the blessings showered on their heads (when successful) would, during the months from October to February, far outnumber all that go to negative processes during the whole year.

Before leaving "orthochromography," let me suggest a subject for dabblers in the new art to try their hands or lenses or plates upon. Let us see what effect they can produce in copying a print on ferro-prussiate paper. If such a print be viewed through yellow glass or, better still, with the sun shining on it, through ruby, the blue colour is transformed to black, and the picture has the effect of a platinotype, with this difference, that the colour is of a velvety richness only seen in platinotypes from the very best and most suitable negatives. A similar result should be rendered with an orthochromatic plate.

The Glossop Dale Photographic Society has set a good example to others, and done itself honour at the same time that it has performed an act of kindness to a class of poor creatures whose lines are cast in the roughest of places. At last month's meeting it was resolved "That the Society give a lantern entertainment to the inmates of the Glossop Workhouse, subject to the approval of the Board of Guardians," which approval would scarcely be withheld, I imagine, unless the Glossop Guardians are made of harder stuff than even guardians are usually supposed to consist of. Bravo, Glossop Dale! Yours is a far better way of amusing yourselves than half a dozen "smoking concerts" or entertainments to your "swell" friends, who don't thank you for being "bored," and can afford to pay for being amused if they want it. Your audience can't afford to pay, and will not be bored.

I notice a revival of the movement in favour of new sizes for lantern slides, this time at Dundee. Mr. Geddes proposes to make a sort of panoramic slide on a plate of the old stereoscopic size, which is to be passed slowly through the lantern after the style of the old travelling "panorama." Whether the plan will find favour remains to be seen, but I expect there will be some difficulty experienced in securing subjects entirely suited to the style.

MONITOR.

PHOSPHORESCENT TABLETS.

USERS of the "Standard" sensitometer would do well to take note of Captain Abney's remarks on the reliability, or rather *non-reliability*, of the phosphorescent tablet as a guide. It has been long well known that for purposes of comparison between sensitive films of varying composition the adopted sensitometer is valueless, and it has further been doubted whether any two samples of the phosphorescent material possess identical qualities; but it would scarcely have been suspected that so old a hand as Captain Abney could have been led astray to the extent that seems apparent from his statement that a tablet in his possession five years old gives a much stronger light than another only two years old.

This difference might arise from two causes: from greater luminosity of the sample of sulphide of calcium originally used for the older tablet, or from the more rapid deterioration of the newer one either before or after spreading the phosphorescent material on glass. As regards the first-named cause, there is of course no doubt as to its

existence, though it may be presumed in the case in question that Captain Abney tested the raw material before using it. The vagaries of sulphide of calcium are well known, not only in the matter of intensity of luminosity, but also in colour, the latter varying from violet through nearly all the shades of the spectrum to red. It is therefore possible that a brilliantly luminous sample may from its colour be of less photographic value than another whose apparent brightness is less. Here lies the great difficulty in establishing a phosphorescent standard, and if the truth be told it seems possible only to employ for purposes of comparison those tablets which have been made from one particular sample of the sulphide and under identical conditions.

Not only do different samples vary in their initial luminosity, but the diversity in their powers of retaining that brightness unimpaired is equally great. Further than this, the conditions under which they exist in tablet form, that is, after admixture with paraffine wax, affect the quality and uniformity of the surface to almost as great an extent. Thus a small quantity of the sulphide I purchased some years ago entirely lost its phosphorescent properties in the course of a few months, though preserved in a stoppered bottle and tied over with a double thickness of thin guttapercha tissue such as is used for surgical purposes. A tablet of it spread, *à la Warncke*, upon glass retained its pristine brightness for a very considerable time until accidentally broken. On the other hand, a larger quantity which has been kept in a jar simply tied over with sheet indiarubber does not appear to have varied appreciably during the four or five years it has been in my possession, though tablets made from it at various times have varied to such an extent in their powers of retaining luminosity that two, which I tried side by side under sensitometer conditions upon pieces cut from the same sensitive plate, gave respectively the numbers 22 and 31.

The temperature employed in making the melted mixture of paraffine and sulphide no doubt exerts some influence upon not only the immediate luminosity of the tablet but also upon its stability, while the thickness of the layer spread upon the glass has an even greater influence in enabling the plate to retain its brightness. I find the best plan to be to apply a very thick coating, using equal weights of wax and sulphide, and the lowest temperature possible to keep the mixture liquid. Such a mixture made in quantity is poured on to a warmed plate of larger size than the tablet required, to the depth of three-sixteenths of an inch, and the whole placed for a few minutes upon a levelled and warmed surface of metal or plate glass. This keeps the mixture liquid, and permits the sulphide to sink to the surface of the glass plate, leaving the upper portion consisting of nearly pure paraffine as a protection against atmospheric influences. When quite cold and hard the back of the tablet may be scraped level, the plate cut to the required size and backed with a second piece of glass, the whole being bound together after the style of a lantern slide, when the result will be as permanent as anything of the sort can well be. The melting point of paraffine varies in good samples from 130° to 136° Fahr., and this will do little harm to the sulphide.

ERNEST GRAHAM.

OXYGEN AND LIMELIGHT MATTERS.

You have already noticed the information given by a correspondent in the *English Mechanic*—Mr. E. Holland—as to the advisability of mixing salt with the chlorate and manganese mixture in making oxygen; and as I tried his method the next time I was making gas after his communication, I am very glad to be able to report that it is really a valuable "wrinkle." Lest it be forgotten, let me repeat that you take by weight—

Chlorate potash	8 parts.
Manganese oxide	2 "
Common salt	1½ "

It is to be observed, also, that the chlorate is *powdered* when using this mixture—not used in crystals as usual. I did not find that it answered *quite* so quickly to any variation in the heat as stated—"instantly" Mr. Holland wrote—but as the gas-burner I use was turned up or down, the flow of gas did respond to it very quickly indeed. It was longer than usual in filling my bag the first time, simply because I was all the while trying experiments on this point, and was quite satis-

fied about it; no one need fear a "rush" who adopts this recipe. There is also a slight advantage in the quantity of gas evolved, for I could have burst the bag or blown off a cap with the same weight of chlorate usually taken to fill it. This action is rather peculiar; for although it is often stated that you get more gas by powdering the chlorate, under ordinary treatment the reverse is the case, and you get less. With the salt you do get more, and the comfort in steady production is very great. We all owe a debt to Mr. Holland for his modification.

A word as to wear of bags. I have already shown how damp and impurity in the gas may be absolutely avoided. But in one point my experience, which is, however, far more limited than Mr. Scott's, differs from his, perhaps because it is more limited. Also, I try to do no work at all in the summer with my lantern. But, with this qualification, I myself dread the cold weather far the most, and most of my leakages have occurred after it. It appears to make the indiarubber more brittle, and as the bag is used and then refolded, the rubber seems to crack or give way in the creases or folds. Vulcanised tubing always "perishes" if exposed long to cold, and probably it is the same with bags. At all events, I have always found bags give way first at the folds, and especially the "corner" fold on each side; and a repair at these spots helps it along for a further period. While, however, pretty sure about this for the time during which I do use gas, I have no doubt whatever as to really hot weather being all that Mr. Scott says.

I planned my own boards differently from any which he has described—disliking cords or straps, or anything of the sort. I prefer a board between the two bags, when no cords or straps are needed. As no strain comes upon this middle board, it need not exceed half an inch in thickness; and my top and bottom boards are only a "full" five-eighths, proper cross-pieces giving the strength at the ends. These boards measure 42 x 34, and bear four half-hundredweights easily, but are not heavy. The legs are also different, there being no base-frame at all, but legs hinged to the front end just like those of a housemaid's pair of steps, while to the other end is hinged a wooden "stretcher," such as is also used instead of a cord on some of these steps. This stretcher rests on the cross-piece joining the two legs, which has sticking up from it two iron studs, over which drop holes in the stretcher. This holds all perfectly rigid and safe; and then, when the gas is about half used, the stretcher is lifted off the studs by the toe of one boot, which also (the front end being a little lifted meanwhile) sets back the stretcher and legs flat against the under side, and lets the whole down flat on the ground. A carpenter's price for the whole set was 17s. 6d., and they are nearly as portable as "skeletons" of the same large size. Legs and stretcher, being hinged to the under cross-pieces, are really attached about five inches from the ends.

A correspondent not long ago gave an altogether wrong impression of the relative cost of bags and bottles in use. To begin with, it will be seen that I should knock off a lot from the cost of pressure boards; and on the other hand, the valves of bottles need pretty constant care to keep from leakage. We may, however, take the cost of the plant at, roughly, the same in both cases, and limes will of course be the same. But it is in the working cost the difference comes, and I agree with a more recent correspondent, that it is this which is prohibitory where cost is any object. Suppose we want 10 feet of each gas, the cost of making which was over-estimated. Really, it amounts to rather over 2 pounds chlorate at 8d., and $\frac{1}{2}$ pound manganese at 2d.—say 1s. 6d. If I use bottles, I must pay for 10 feet at 8d., 6s. 8d.; and 10 feet of house gas at 6d., 5s.—in all 11s. 8d., just 10s. 2d. more. Well, I cannot afford it. Like your second correspondent on this point, once let us have the oxygen at 4d., and house gas at 3d. (the latter practically costs the pumping and wear and tear alone), and I will never make any more. But I much doubt if this will ever be the case, and must not be understood as implying that the present charges are at all excessive. I am told that even they only "pay" during the regular season, and do not pay except when in full swing. The fact is, the plant is very expensive, and rapidly deteriorates when not in use. At present, I am told, the gas is pumped in the first instance into large pressure gasometers or reservoirs of immense strength and very costly, and the small bottles are filled from these, and not direct from the pumps as formerly. When this was done, so much heat was generated (precisely as in a "five-syringe" experiment) as to be dangerous, and the explosion at the Royal Institution was believed to be due to this

cause: hence the new plan, which also keeps the pumps at work for some time continuously, which is necessary to profit. If this is true, I fear any serious reduction in price is hardly possible. This is the real obstacle to the adoption of bottles, where mixed jets are used; and all the argument in the world will not get over it till the solid figures are changed.

By the way, I should like to know one point about the new regulator from any who have used it. Will it keep the pressure down when the jet is turned off, so that it may be turned off when desired and the consumption stopped? That is the real test; if it will do this it must be all that can be desired.

Perhaps I may be allowed to state, in reference to the jet alluded to by Mr. Pringle recently, as made for him by Messrs. Newton, that (except as regards his own additions) it may be regarded as my jet, or what has been arrived at by my own experiments. All that I required for these—each little modification arrived at step by step—was carried out by Messrs. Newton, and subsequently tested with them; and the nipple was bent backwards and forwards many times at various angles, before that he describes was adopted. The nipple, also, is the external shape we found to give the best light, and the large and ample mixing chamber is of special importance, and allows every operator to introduce any kind of packing he desires; though the jet is usually supplied with only one piece of gauze, and I myself generally use none at all. The lime-turning motion is also that described by me last winter. I must say, however, that I find it easy enough to burn big holes or pits in the lime even at this angle, and believe pitting depends more on the power used and the lime than on mere angle. Mr. Pringle's own addition will be very convenient for me. Hitherto I have attained the same object in my own experimental work by using a dissolving tap, and corking up one set of apertures. It will be seen how this operates in the same manner for a single lantern, which is chiefly in use; but Mr. Pringle's addition on the jet itself will save fixing a dissolver, and be more convenient to me in many ways.

LEWIS WRIGHT.

A CRITICISM OF THE PLATINOTYPE DISCUSSION.

Few persons have done more to benefit photography in its historical aspects than Mr. W. Willis, in that he has effected so much in the way of making photographs permanent, instead of but ephemeral phantoms serving a temporary purpose. In society, the encouragement of the almost lost art of miniature painting is now reviving, probably because of the experience imparted by the deplorable appearance of likenesses in old albums, so that the phrase is gradually coming into use, "Only a photograph;" in short, it is high time that professional photographers bestirred themselves to start a new fashion in photographic portraiture, and endeavoured to convince the public that the new pictures are permanent, consequently that the poor man can have his family portrait gallery as well as the rich one.

In view of the importance of this one of the several comparatively permanent processes, perhaps a few critical remarks about the recent meeting of the London and Provincial Photographic Association in relation to platinum printing may not be out of place.

Döbereiner, many years before the announcement of the Talbotype and Daguerreotype processes, discovered that a solution containing an oxalate and bichloride of platinum would throw down metallic platinum when exposed to sunlight. This early discovery of the first principles of one of the platinotype processes, has not, so far as I know, been heretofore emphasised in the photographic literature of this country. I discovered about Döbereiner's achievement in the course of researches in the British Museum Library, but afterwards found out that Dr. Eder was aware of it, for he gives a few lines to the circumstance in his great standard work on photography now in course of publication in parts. In the English translation of the admirable little book on *Platinotype*, by Captain Pizzighelli and Baron A. Hubl, the opening sentence relates to the frequently quoted experiment by Sir John Herschel, announced to the British Association at Oxford in 1832, of treating bichloride of platinum with excess of lime water and exposing it to light, whereby chloroplatinic of lime was thrown down; the authors then give some experiments by Döbereiner, made public in 1834. Apparently they are not aware that Döbereiner was in the field before Sir John Herschel, and that, too, with closer approximation to a working photographic process. On page seven they state that Döbereiner found out that a solution of platinum chloride is decomposed by light in the presence of oxalic

well as of some other organic acids, but they give no date. On page twenty-three they state that Döbereiner was the first to observe the reduction of some of the organic ferric salts by light, and did so in 1831, but here they say nothing about the reduction of platinum. Sir John Herschel has done splendid work for photography, but in this particular instance the book should have opened with the discovery of Döbereiner, and not with the later one of Sir John Herschel. In early times Döbereiner also reduced chloroplatinite of potassium by light in the presence of potassic hydrate and alcohol. Döbereiner's discovery gives the early history of the platinum process a highly respectable and not generally known antiquity.

The question was raised at the recent meeting, whether the presence of gelatine in the paper, and a combination of it with a salt of platinum, would cause the whites of a print to darken under the influence of sulphuretted hydrogen. Mr. Willis says that he avoids gelatine, and as a substratum uses starch. In relation to this matter Captain Pizzighelli and Baron Hubl say that starch as a substratum gives platinum prints of a sepia colour, whilst a gelatine substratum gives pure blacks, bluish in the half tones; with their commercial papers they use a substratum of gelatine. The rest of the process they employ is virtually the same as Willis's, so on the point just mentioned there is a discrepancy between the statements of the highest practical authorities on the platinum process, which discrepancy requires clearing up. In the sizing of the paper itself as turned out by the manufacturers, Captain Pizzighelli and Baron Hubl intentionally or unintentionally avoid gelatine, their paper being "sized" at the mills with "resin," if the expression may be allowed. They say, "The paper we use is half sized (resin-size)." They avoid papers containing ultramarine, because it turns yellow under the influence of hydrochloric acid. That several platinum salts exercise a coagulating power upon certain colloids is known, and Sir Humphry Davy was, so far as my literary researches on the subject go, the first to make known the fact, for in a paper of his read before the Royal Society in days before he had been admitted a fellow thereof, he alleges sulphate of platinum to be the best known test for "jelly." He dried the precipitate so produced at a temperature of 212° Fahr., then analysed the product and found it to consist of 56.11 parts of oxide of platinum, 20.02 of sulphuric acid, and 23.87 of "gelatine" and water. I have found some of the salts of platinum to slowly coagulate collodion in a closed bottle to a tough, springy residue. As regards the other portion of the problem mooted at the meeting, it should be known that paper manufacturers sometimes use at least two kinds of sizing, and that once the *Société d'Encouragement* of Paris gave the following recipe as the best one it knew, and in which it will be noticed there is no gelatine:—100 kilos. dry paper stuff; 12 kilos. starch; 1 kilo. resin, previously dissolved in 500 grammes carbonate of soda. There are several other published formulæ for resinous paper-sizes if any one cares to hunt them up, but the worst of the matter, from a photographic point of view, is that, as a general rule, all kinds of refuse and inferior samples of material are considered good enough for use in the manufacture of the substance known as paper, which substance at the present time is acknowledged everywhere to be a chemical product, rather than an output of guaranteed material consisting chiefly of the cellulose of the cotton plant.

To those who are working the platinum process of commerce, I would recommend a trial of hot instead of cold water, acidulated with hydrochloric acid as in the usual clearing baths, and to take care to give each print its full time in those baths, because I have found attention to these two points to have much influence in clearing the residual iron out of prints in various processes not connected with platinum, in which a salt of iron is used. It would be well to ascertain whether old platinum paper has more tendency to retain iron than paper freshly prepared. Furthermore, it would be well to get on record the influence, if any, of the soaking of the prints in alkaline solutions for two or three days, as such solutions exercise special solvent power upon some of the subsalts of platinum, the object being that an effective platinum printing process shall stand before the world without fear and without reproach.

One thing which has tended for years to keep back the adoption of platinum printing in this country, is the feeble blacks of nearly all the platinum prints exhibited until recently at public exhibitions; the prints usually had a weak, washed-out look. The first platinum pictures with rich deep shadows seen by me, were exhibited at the 1885 Exhibition of the Photographic Society by a Cambridge photographic portraitist, and the prints exhibited quite recently by Mr. F. M. Edwards leave nothing more to be desired in that respect. Yet we have Captain Abney publicly complaining but a few weeks ago that he could not get deep blacks with the paper, and questioning whether his sample of the paper had been too thinly coated. Are these variations in the results of operators due to their own

method of manipulation, or due to variations in the issued samples of the commercial paper, whose proprietors certainly cannot be supposed to wish to do anything which shall raise prejudice in the public mind against platinotype prints as compared with prints of silver upon albumen? M. Léon Vidal does not wish for a strong glaze upon platinum prints, but suggests that they would look richer if treated with a solution of shellac in borax, dried, and rolled: There may be something to be said for this with prints of *carte* size, and the elegance and good taste of the French in artistic matters carry weight, but I think that except with prints of less than half-plate size, if taken upon a *smooth* sample of platinotype paper, there would be a loss of artistic beauty were any more glaze given; Mr. J. B. B. Wellington's platinotype pictures practically illustrate what I mean.

W. H. HARRISON.

PHOTOGRAPHIC LENSES.*

I SHALL now show, projected on the screen, a considerable variety of photographic objectives, and make a few observations on each in turn. First of all I remark there are two ways by which a plano-convex or a meniscus lens can be achromatised. A biconvex crown may be wedded to a plano-concave flint, or a concavo-convex flint to a plano-convex crown. If the meniscus is to be very deep in its external form its components may be a plano-convex crown cemented to a plano-concave flint, although opticians generally prefer that the contact surfaces be curved, on account of the greater command it gives them for the correction.

The earliest form of objective was the plano-convex or slightly curved meniscus. For reasons already given it has a diaphragm, or stop, in front. In order that it should work with a larger aperture the late Grubb reversed the relative positions of flint and crown, by which he was enabled to bring the diaphragm rather closer to the lens. Still later the late Dallmeyer modified it by placing the flint between two crowns, for which further advantages were claimed. By recent improvements in the selection of glass and curvature, this old objective (which in all its various forms is still much employed) is now made with such a large fixed diaphragm as to render it capable of being employed in portraiture. This, of course, is owing to the minimising of the spherical aberration. While admirable in other respects it is unsuitable for copying or for architectural purposes on account of its refracting the lateral rays in a greater proportion than the central ones. This distortion does not show near the middle of a picture, but becomes apparent when the included angle is moderately wide. From the nature of its construction it cannot supply the condition of orthographic projection, namely, that a ray shall emerge in a direction parallel to that at which it enters. To this end the ray would have to pass through the optical centre, which in such a lens cannot be done.

The Petzval portrait lens consists of a nearly plano-convex achromatised lens in front, with a double convex posterior lens at the other end of the tube. This latter is composed of a biconvex crown and a concavo-convex of flint glass, the inner curves not being concentric, and the two are separated to a slight extent. This back combination fulfils a two-fold function; it shortens the focus and thus intensifies the illumination, and as it possesses a large degree of negative spherical aberration it counteracts the positive aberration of the front lens, and thus with a large aperture it brings rays to a sharp focus over a field quite large enough for single portraits. Some years ago Dallmeyer introduced a modification of the back lens, reversing the relative position of its elements, as Grubb had done with the landscape lens, the requisite negative aberration being obtained, as in the Petzval back, by the inner surfaces not being concentric. This form of back lens lends itself to the lowering of definition, when such is desired, as in the case of large faces in which the rugosities of the skin are not always desirable.

An American optician, Morrison, makes some of his portrait lenses (especially those for taking a large standing figure with full aperture) with an uncemented front lens and a Petzval back, the inner curves of the front lens being non-concentric.

The most recently introduced lens of the portrait class owes its inception to Steinheil, and is constructed on lines quite different from all others. The front is a cemented positive combination, and consists of a convex crown and a concave flint. The back combination is composed of a biconcave flint and a biconvex crown, these being separated to some considerable extent. Each combination exhibits chromatic and spherical aberration to a large extent, but in an opposite sense, so that the two combinations correct each other.

He has also imported the same idea in the construction of a land-

* Concluded from page 84.

scape lens possessing greater power, and in which the back crown element is of unusual thickness, and is cemented to the flint. It is claimed for this construction of objective that the marginal definition is of superior class, and that astigmatism has been eliminated. In the landscape form the lenses are set so closely together as barely to permit a diaphragm to be inserted between them. The name "antiplanat" is applied to them.

One or other of the lenses above described is employed in everyday portraiture in the studio. It is that class by which the greatest angular aperture can be secured.

I have said that Petzval made the calculations of two objectives. The second, which lay in abeyance till 1857, was designated the orthoscopic lens, from a property claimed for it of giving rectilinear projection, but which subsequent investigation proved unfounded. Although it has been supplanted by others it is a useful lens, and gives good definition over a moderately large field with a large aperture. The front lens is the usual front achromatic of the portrait combination, with a smaller negative lens or dialytic placed a short distance behind. This dialytic lens is composed of a meniscus flint and a biconvex crown. This lens is useful when one desires to take a larger image than the extension of his camera permits, as its focal centre is anterior to the front combination.

Out of the orthoscopic lens were evolved others of different forms which were free from the imperfection to which I have alluded, the most popular of these being the triple achromatic lens composed of three cemented compounds, the front and back being plano-convex or slightly meniscus in form with an achromatic negative lens between them by which the field was rendered flat.

The triple combination lends itself in an admirable manner to the production of what I may term a universal lens, by which I mean adaptability or adjustability of focus. Some years ago I constructed a lens of this class in which a very wide slit was cut right through the mount in the position occupied by the concave lens. In this was fitted a sliding piece of brass pierced with four holes, in each of which was set an achromatised lens of a negative power. Notches on the slide ensured the lenses being quite central. The combination to which this system is attached is composed of two nearly plano-convex lenses, which when used alone do not give a flat field. By inserting the slide the influence of either of the four concave lenses is to lengthen the focus and flatten the field. The foci I obtain by this slide are respectively seven, nine, twelve, and fifteen inches. When not in use this slide packs away in a neat little pocket case, six inches long by one and a half inches wide, and half an inch deep. Of the advantage of being able to secure more or less subject on a plate, without having to unscrew or change the lenses, I need not speak.

Wide-angle non-distorting objectives are a great power in the hands of a photographer who knows how to use them aright. Among the earliest of these was the American globe lens, so termed from the outer surfaces forming part of a globe or sphere. From the example now shown, it will be observed that each lens (the combination is symmetrical) is formed of a meniscus crown with the shorter radius from the optical centre, cemented to a concavo-convex flint. The construction of this lens favoured the formation of a flare spot or ghost in the centre of the picture, which would have disappeared had the maker departed from his globular idea and brought the lenses a little closer together.

In 1864 Ross took the matter up and brought out a doublet free from the shortcomings of the globe. It was unsymmetrical in internal structure, being composed of a biconvex and a biconcave cemented front, and a concavo-convex and meniscus back combination. The lighter element, as you see, is to the outside of the front and the denser element to the outside of the back. Soon after this Zentmayer introduced a ratio lens, one in which the front and back elements were of dissimilar diameter and focus, the diaphragm being placed in the optical not the mechanical centre. The objective was composed of two single or non-achromatised meniscus lenses of very deep curvature, and included a very wide angle. A feature by which it was distinguished consisted in a series of lenses of different foci all screwing into one mount under such circumstances as to retain the diaphragm in the correct position for all of them. This was improved upon by Dallmeyer, who made a wide-angle rectilinear lens in which the lenses are each achromatised.

A wide-angle lens much used in America, made by Morrison, consists of a very deep achromatic front lens and a single or non-achromatic crown meniscus as a back lens, of rather flatter form than the front. This, presumably owing to slight over correction of the front, aided by the well-known adaptability of the deep meniscus form, defines sharply over an extended field. There are other forms of wide-angle lenses, but I have spoken of most of those of a representative character.

We now come to a class of lenses so similar to each other in construction that one diagram will suffice to illustrate all. They are those to which the prefix "rapid" has been in many cases applied, in addition to a nomenclature so stupendous as would indicate the ransacking of almost every living and dead language to supply.

In 1866 Steinheil introduced a lens formed of two cemented combinations, adapted for covering a moderately large field with an aperture of a seventh of its focus. Instead of forming it of flint and crown glass, which would not admit of such an aperture being employed, he used two kinds of flint glass, one possessing a higher index of refraction and dispersion than the other. From their wide aperture they were designated *aplanats*.

Numerous makers took the matter up, some by servile imitation, others by making departures more or less slight. This objective, which is more or less good according to the skill of the optician by whom it is made, is, for all-round work, one of the greatest possible value, for in a fairly good light it acts as a portrait and group lens; it is sufficiently rapid to enable the photographer to secure horses, even railway trains, in motion; it is orthoscopic, or rectilinear, hence can be employed for copying, and provided care in this respect has been bestowed upon its construction, it serves as a landscape lens, in giving no ghost or flare. But it is unfortunate that some makers, in their efforts to render it otherwise perfect, do not realise the importance of providing against the defect named. The lenses are separated so far as to hit a happy medium between flatness of field and astigmatism, and this is not unfrequently attended with flare. I have invariably found that this defect may be cured by bringing the lenses a little closer together in the mount. Even so little as the width of two threads of the screw has proved to dissipate the flare spot, which in many cases consists of an image of the diaphragm which has a relation of conjugate focus to the back lens when internal reflections form a factor in its production, although it is sometimes occasioned by reflections from the front lens. Some makers of this lens have departed from strict symmetry, and claim that a more satisfactory result is obtained by having the back lens a little shorter in focus than the front.

But to revert to Steinheil: he did not rest satisfied with the introduction of the lens just spoken of, but made another having less angular aperture and greater angular covering power. It is formed of material similar to the other, the lenses are very thick, and are set very close together. Owing to their small diameter, lenses constructed on this principle are singularly portable, considering their great covering power, and one of our leading optical firms in London has made a speciality of extremely portable lenses of construction akin to that projected on the screen, in which the mounts of all are of similar diameter and fit into one flange.

Morrison, of America, makes lenses for which properties analogous to those described are claimed. He employs ordinary optical flint and crown glass, and corrects by making his crown lenses plano-convex, united to biconcave flints, the contact surfaces of which are but very slightly curved. One peculiarity of this form is that definition fulfilling the requirements of artists is obtained by lenses having shallow curves, and being made of ordinary flint and crown, they are less liable to discolouration by light or abrasion by friction than if composed of dense flint. The lens shown on the screen also serves to illustrate the configuration of the American lensoscope objective, which, being made of large dimensions and long focus, is mainly intended for large direct heads.

There are several other topics than those touched on which belong to photographic lenses. Among these are diffusion of focus, so called, or depth of definition as produced by spherical aberration, and by the use of a diaphragm; astigmatism; conjugate foci; lenses for special purposes, such as projection, enlarging, detective and panoramic cameras; the shape and use of the diaphragm and its proper position; the nature and cure of distortion; single or unachromatised lenses; the testing of lenses for the various aberrations, and, lastly, their grinding, mounting, and treatment. But it would be impossible to get all these overtaken in one paper.

J. TRAILL TAYLOR.

DEVELOPMENT OF EASTMAN BROMIDE PRINTS.

[A Communication to the Camera Club.]

CERTAIN remarks that have lately reached me, by channels public and private, caused me to devote some time and a little careful experiment to the use of the bromide paper sold largely, in America and here, by the Eastman Company. I confine my remarks, as I confined my experiments, to that paper, but I would like it to be clearly understood that, for all I know, other bromide papers may come under precisely the same rules, may have the very same defects and the very same excellencies, as the Eastman paper. I have never used any

of the other bromide papers since certain improvements, of which I read and hear, have been made, and I have no right and no intention to say a word, good or bad, about any paper except the Eastman, and so I trust I shall not be taken up wrongly by any one who uses other papers.

A member of this Club made, at a meeting, the remark that "thin, flat" negatives were required, or were the best for printing on bromide paper, by contact, as I understand him to mean. In terms very plain, but I hope, not brusque, I expressed my opposition to his statement; but soon after, remembering that my experience of papers, other than Eastman's, was not of very recent date, I was inclined to repent my haste, more especially when a skilled office-bearer of this Club told me by letter that some of our best workers disagreed with me on the point at issue. I felt confident enough of my rectitude regarding Eastman's paper, "but," thought I, "Eastman's paper is not every paper, and I may be wrong about other papers." Then, in an editorial in THE BRITISH JOURNAL OF PHOTOGRAPHY, I came across the following sentence, plain enough and inclusive enough, to put me on my feet again:—"In development printing on bromide paper, the best results will accrue from the employment of a tolerably vigorous, though harmonious, negative." (THE BRITISH JOURNAL OF PHOTOGRAPHY, December 24, 1886.) Now, we all know that a "tolerably vigorous" negative cannot be synonymous with a "thin," much less a "flat" negative. So that on the whole I gave up my idea of smoothing down my assertion, and my opinion remains as it was, that thin, flat negatives are *not* the best for printing on bromide paper of any kind with which I am, or ever was, acquainted. That a decent print *can* be made on bromide paper from a thin, flat negative I will allow—in fact, I propose to attempt to prove it; but to those intending to print on bromide paper, my advice is to make your negatives anything you like *except* thin and flat.

I send for your inspection a few negatives, picked out of the few not packed away, as being representatives of what I venture to call various-characteristic negatives. I did not choose them as likely to give me good prints; I did not intend to make good prints. I chose them as being of very different kinds. You will find one a mere ghost, another outrageously dense; two others of the same view—one over dense, the other too thin in about the same proportion. Except one, the views are all more or less snow scenes, one being a very awkward subject, a dark foreground *in shadow*, with a background of snowy hills. Two of them are unprintable on albumen without "dodging" or specially prepared paper; the others are all more or less printable, but not one of them makes a really good albumen print, though several print passably.

I send also twelve consecutive prints on bromide paper; these I made straight ahead. I send all I made, good, bad, and indifferent, and in printing them I used no dodges of any kind; I put no paper nor colouring material, nor did I mask any part of any negative. One I held to the gas at a slope; there is a slight appearance of masking, but you will find it due to the negative. Apparently there was a cloud on the hill, though I did not notice it.

The exposures of these prints vary considerably, as you will gather from the appended notes. Mr. Burton will tell you the proportion between ten seconds to gas at sixteen inches, and ten seconds to daylight; it is a pretty large figure. I included in my trials a couple of exposures in the daylight enlarging camera, but it was impossible to gather any lesson from these, as the light was very bad and constantly changing; in fact, a heavy fall of snow came on in the middle of my second exposure. My developer also varied in strength. I began each time by making a solution of six of Eastman's potash-oxalate solution to one of his iron, and I added each time half a grain of ammonium bromide to each ounce of the ferrous-oxalate solution. But, as you will observe, I added water sometimes, and a very great difference it makes in the result. On two occasions I added a drop or two of my hypo bath, and in one, which I have purposely left untrimmed, you will see, on the left top corner, the red fog, due to an over-dose of hypo, or rather to pouring on too frequently at that place a developer containing an over-dose of this very debatable accelerator. While I am on this subject, may I suggest that it would be very instructive to members if failures were more frequently shown? More may be learned from one failure, if the operations have been carefully noted, than from one hundred perfect results. My chief regret is that my negatives are nearly all snow scenes. These are so little familiar to us that it is more difficult to arrive at sure conclusions; but, as I said before, I had only a few negatives at hand, and they were either snow scenes or else too good for my purpose.

But the conclusions I arrived at were perfectly confirmatory of what I had gathered from less accurate observation, and I will venture to state some of them.

First. With bromide paper prints can be produced, without any dodging, from negatives practically unprintable by any other process. I would like to see a decent print by any process whatever, except bromide paper, from the dense negative of Haddon Hall that I exhibit, and yet, instead of over hardness, which is the character of the negative, my print is, if anything, the very opposite. And, except by gelatino-chloride paper, I do not think any decent print could be produced from the negative already referred to (a foreground in shadow, with a background of snowy hills), and yet my print is the very opposite in character to the negative, for while the negative is, for the most part, a spectre, the print is distinctly hard. I do not think any amount of dodging with other processes would make good prints of these two, yet you will see that with slight variation in exposure I might have made these prints *perfect*, while dodging is as easy with bromide-paper printing as any other process. For example, if I had any great object in making a perfect print from the spectral negative, I would mask or colour the weak part. The other, the dense negative, requires nothing at all beyond a very long exposure. Printing this on albumen, to make anything like a decent print, I have had to sun the paper down to an alarming extent, and the negative is altogether too hard, even for platinotype.

Secondly. I concluded that there are certain rules which can be laid down for the guidance of workers with this paper, and some of these rules I may point out.

(A.) Full exposure means softness. (B.) Short exposure means contrast. (C.) Strong development means brilliance. (D.) Weak development means softness. (E.) Bromide means vigour.

Now, if we have a good medium negative to print on bromide paper we can do pretty much as we like with it. We may make a hard contrasted print by a short exposure and a strong development, or we may make a "soft" print by full exposure and weak developer. A very hard negative can be made, in printing, as soft as desired by a long exposure to a bright white light and a weak developer. A very "thin, flat" negative may be made into a print as plucky as we wish by a short exposure and a strong developer. Bromide has a very powerful action in the developer; if the image comes up too quickly, an extra dose of bromide, applied instantly, may make the print brilliant, even to hardness. But, I think, if the image does not begin to appear with full-strength developer in about thirty seconds, or forty at the most, *that* print will not be of much use. When the developer is weakened with water, the image appears more slowly and gains density more slowly; sometimes a minute elapses before any appearance of image. If the development is *too* slow a certain grain appears in the paper; *that* print, as a rule, is not worth much.

It is very important to acidify the paper after development and before washing. I use citric acid; water with much lime is bad. Always alum after fixing. My prints sent are not alumed; I had no time. You can give the prints a glaze by squeegeeing to talcid glass, or to ebonite sheets, or you can leave them with their natural surface, smooth or rough.

And the bromide prints are "Permanent"—as permanent as any purely photographic printing process we have.

ANDREW PRINGLE.

PHOTOGRAPHIC PORTRAITURE.

[A Communication to the Edinburgh Photographic Society.]

As the painter must ever be beholden to his brush and other mechanical aids to the expression of his genius, so must the photographer make intelligent use of his appliances in order to the production of his best efforts. As portraits may be painted or produced by other means than those usually employed, so may photographic portraits be produced without a studio, but to the professional man the studio is as necessary in the one case as in the other. Amid all changes certain requirements remain, and the studio is one of these. Let me say a word about it. All manner of construction and situation is to be found, and probably advocates for every variety we can think of; but while many are compelled to do with less than they could wish, or a different situation than they could desire, a very general inclination will be found in favour of a north light. My own preference is decidedly towards a north or north-east aspect. My studio is seven feet six inches in height at the side, rising from that at an angle of forty-five degrees. This I consider a good serviceable height. It will be found that a high roof lessens the effective control of the light by the operator, without which just so much more difficult and uncertain will it be to obtain the most satisfactory results. The construction of a studio, apart from its relation to the principal light, has not, I think, very much effect one way or other on the work produced in it, unless it is of a most awkward and inconvenient description. It must be a very faulty studio indeed in which good work

cannot be done, provided there be on the part of the operator the necessary knowledge of the requirements of any particular case, and how to meet them by skilful adjustments, and what I might call artistic tact.

In the matter of lighting the subject, one man's work is apt to partake of a certain uniformity of character, arising from his constantly working under the same, or nearly the same, conditions. A very common error many operators fall into is to set every sitter on the same spot and endeavour to direct the light they judge most suitable on that spot, instead of trying the effect of different points, where they may be placed in relation to the main light; in fact, bringing "the mountain" to Mahomet, instead of Mahomet to the mountain. Where the facilities for doing this are very limited, or where it cannot be done at all, there is no more to be said, and the best must be done with what is available.

Where we have to deal with strong contrasts, such as white hair and high complexion, or white and black draperies, the subject will be most effectively treated by being made to face the light; where the conditions are reversed, an opposite treatment, according to the particular demands of the case, must be resorted to. The matter can only be referred to in general terms. A skilful operator will determine what to do when the subject comes into his hands, and especially when he sees the sitter in the light which falls just about where he is to be taken.

If good lighting necessitates considerable study and knowledge of effects, posing demands no less; indeed, the art of lighting a subject may be mastered with tolerable completeness, while posing may never be thoroughly acquired, because it is less of a mechanical accomplishment. It calls for a knowledge of harmony of lines, and the effect of balancing of parts—what, in short, is described as composition, and which every one does not naturally possess. An operator may fail in this, just as painters sometimes do, who, though good colourists, are defective as draughtsmen and in the ability to conceive a good picture. We sometimes feel that photography is too literal to be artistic. From a client's point of view, its tendency is to exaggerate the imperfections rather than the *perfections* of face and figure. Should you have a stout figure to photograph, the neck, as a rule, will appear short. To obviate this appearance in the portrait, it is best to adopt a standing pose, with the camera a little below the level of the head. If a sitting position is chosen, undue height will be given to the shoulders, and the shortness of neck will be emphasised. In treating the opposite extreme—a thin figure with sloping shoulders (not so objectionable in the gentle as in the sterner sex)—I would recommend a sitting pose, and in the case of gentlemen, especially when the head is large, a little drapery, in the form of an overcoat loosely thrown back. The head should be turned in the reverse direction from the angle at which the body is placed, which will help to give the appearance of substance and harmony to the figure, and altogether make the picture more pleasing. A little attention of this sort will improve defects in the sitter just as easily as the want of it may produce them where they ought not to exist. As a rule, twist the figure as little as possible when the person is stout. Some people turn the head more gracefully in one direction than in another; the head seems balanced in the one case, while in the other it may be the line of the neck and shoulder forms too great an angle. Should it be necessary to take that view of the face which gives prominence to this defect, turn the figure away, and the head towards the camera.

WILLIAM CROOKE.

(To be continued.)

CAMERA CLUB CONFERENCE.

DISCUSSION.

THE papers (already published) which were read at the morning sitting were by Messrs. Adcock, Burton, and Traill Taylor. Previous to the reading of his paper *On Studies*, Mr. Adcock remarked that it was not written for those present, but to be read by those who were tyros in photography like himself.

Captain Abney opened the discussion by calling attention to the illustrations of the lecture exhibited on the walls of the Hall by Mr. Adcock—studies of hands, of feet, of figure, and of still life.

Rev. Mr. Lambert felt himself in harmony with Mr. Adcock in his treatment of the subject. His own introduction to photography was through the artistic door. The time required for painting and studying tree anatomy in the open in winter was too long to be endured. In regard to figure work he referred to the exaggeration by the lens of nearer objects, such as the hands. From the study of art collections, he found that at certain periods of art history there was a tendency amongst artists to diminish the size of hands in portraiture. He thought the camera would be a safeguard to keep near to the proper proportions; it was certainly

useful to artists, especially in cloud and wave studies, and still more in tree anatomy.

Mr. Austin wished to know more particularly why Beach's developer was called a "rut." He had succeeded in producing uniformly bad results with every developer, but he had certainly seen the highest quality of work from a use of Beach. It seemed to be regarded as the photographic slough of despond.

Mr. O'Farrell said the hands in most figure work were in a different plane from the principal parts of the subject, and of necessity suffered from exaggeration. In this way photography would rather mislead than assist the artist. It might be interesting and useful to artists to photograph trees bare in winter, and then to make a careful comparative study in connection with photographs of the same trees clothed in summer time.

Captain Abney made reference to Mr. H. P. Robinson as working out every picture on paper in monochrome before arranging the compositions for photographing. For instance, *Bringing Home the May* and *Dawn and Sunset* were examples of this method. From much association with artists he could say that the hands were regarded as expressive of character as much as the face. One of the greatest portrait painters of the day seemed to be in the habit of avoiding the hands. There seemed to be some danger of drawing in the Board schools being suppressed unless influence should be brought to bear to continue it. He then referred to the distortion caused by lenses. If a lens of shorter focus than the natural focus of the eye be employed the perspective is exaggerated, and, in enlarging, the exaggeration is increased. He believed direct large pictures, particularly with near objects, better than enlargements. In a figure subject the sitter was half the artist and the honour greatly due to him. The sitter who claimed part credit for an artistic figure study of himself could by no means have applied to him the ironical story of the organ blower, who said, "How beautifully we played last Sunday." He thought the eye should be constantly educated by a mental study of every scene. As to the use of photography in representing waves and movements of animals he considered these were never seen as rendered by photography. The persistence of vision caused a composite effect, for instance, lines of light on sea in sunlight were seen by the eye and not dots as shown by the instantaneous photograph. The movements of the legs of horses in motion, too, were atrociously inartistic, and, he thought he might add, untruthful.

Mr. Adcock said he regarded Beach's developer as a "rut" from an aptness to be prejudiced against anything new that suddenly displaced long trusted formula. The ten per cent. solutions of pyro, ammoniac, and bromide, he thought, a far less mechanical developer. He could not controvert Captain Abney in regard to his remarks on enlarging. Notwithstanding his recent conversion to enlarging he had to admit that his examples shown were taken direct with a large Dallmeyer's rapid rectilinear lens of more than thirty inches focus. He had been led to his subject by consideration of a picture in one of the illustrated periodicals, the *Century*, of the hand of Abraham Lincoln. He had wondered whether it were really a faithful representation of his hand. The value of a correct record of the characters of great men as shown in their hands would be of great value.

TESTING THE SENSITIVENESS OF PLATES. (By W. K. Burton.)

Mr. Webber said he would like to be informed what effect the depth of film on a plate had in regard to its sensitiveness. Plates of recent make seemed to be decidedly thinner and did not give the range of tones of the early plates. He thought that the makers stinted the amount of emulsion.

Mr. O'Farrell asked whether it was not more a question of the quantity of silver in the plate rather than the thickness of the emulsion.

Captain Abney said he was not one of those who regarded sensitometers as perfect indicators, but they gave a very good idea as to the sensitiveness of plates. Screens as now made were not uniform. He then gave his reasons why he considered Spurge's the best form. In a good plate rapidity was required, and, another point, more particularly gradation. No thin-film plate will give gradation from one to twenty-three, some only as far as eight. Thickness of film was essential to give gradation though the thin plate might be equally sensitive. In regard to phosphorescent screens he had not found those he had kept embedded in paraffine decay. They had retained their luminosity with him for several years. Some were simply painted with Balmain's oil paint, and the oil appeared to cause the tablet to deteriorate. He differed from Mr. Burton as to the effect of the iodide with phosphorescent screen, and illustrated his contention by a diagram to show the dip in the curve of sensitiveness for iodide at the point where the phosphorescent light was emitted.

Mr. Burton would emphasise the remarks made by Captain Abney as to the necessity for thickness of film. In thin films the scale of light recorded was reduced, early reversal was caused, and he fancied sensitiveness also was diminished. Much less light was probably absorbed by thin than by thick films, but he had been unable to observe it. As to the decadence of phosphorescent screens, one he had kept in paraffine was disintegrated, only some spots giving light.

Mr. Sage thought every plate maker ought to put the sensitometer number on their boxes of plates. He then asked leave to refer to the remarks on Beach's developer, and asked what objections could be raised to an ordinary potash developer.

Captain Abney said Beach's developer did not allow such latitude. He thought the pyro potash might be a good developer if used with

brains. He did not believe in the term over exposure; it was the relation of exposure and developer that governed the final result. He had secured good pictures from plates many times over exposed—they were, in fact, properly exposed for the developer he employed.

AMATEUR ENLARGING ON A SMALL SCALE. (By J. Traill Taylor.)

Mr. Webber made inquiry as to the increase of heat in the lantern from using two burners.

In reply to inquiries from Dr. Foulerton, Mr. Taylor remarked that the small plano-convex lens acted somewhat the part of a condenser in addition to the other ordinary condenser.

Mr. Wormald asked for the number of the burner used.

Mr. York said he used an ordinary fish globe as condenser and doubled the light, and suggested the inversion of one of the burners.

Mr. H. Trueman Wood referred to the incandescent gaslight where a cap of muslin dipped in certain metallic salts was placed over the burner. The source of light, however, was rather a large one for lantern purposes. There was a difficulty in lighting up more than a 5×4 plate except by daylight. He had used a large bottle of water successfully as a condenser, but the light was not strong, being lost in passing. No condenser was absolutely required for small work; ground-glass or tissue-paper might be used to diffuse and equalise the light all over the plate.

Mr. Lucas asked how long it was after lighting the lamp before the albo-carbon material was sufficiently melted to come into action.

Captain Abney had tried the incandescent gas or Auer-Welsbach light. There was three times the amount of blue light in it that was found in the ordinary gas flame. The cap of muslin was dipped in salts of zirconium and lanthanum. The light was so intensely white as to be disliked by ladies on account of its being unbecoming for the complexion, a distinct advantage in photography. The heat ray, too, was small compared with what ordinarily obtained. Only one-third the exposure would be required for the same amount of apparent light. Mr. Taylor's plan of using a small second lens as condenser near the flame was one already adopted for military purposes in throwing light over surrounding stretches of country.

In reply to questions from Dr. Foulerton and others,

Mr. Swift said he thought the light was to be obtained, or could be shortly, as he understood the Company interested in it had offices at 4, Jeffrey-square, E. C.

Mr. Taylor, in reply, said that the inverting of one of the burners, as suggested by Mr. York, was not necessary, for, by the suitable placing of the diaphragm, its aperture was opposite a uniformly bright flame. The size of burner used was No. 2. Although his experience with the incandescent gaslight spoken of by Mr. Trueman Wood was only limited owing to its not yet having been introduced commercially, yet had he had considerable experience with that form of incandescent burner in which platinum gauze was employed instead of Dr. Auer's system of muslin. An objection to the former was the great length of the chimney necessary in order to create a draught sufficient to render the platinum incandescent, otherwise it was excellent. In order to melt the albo-carbon material quickly, he lifted the reservoir out of its socket, and by holding it over the gas for a minute it was ready for use at once instead of having to wait till it melted in the ordinary course. Reverting to what he had seen of the two modern incandescent gaslights the Lewis, or platinum, and the Welsbach, he thought that for producing enlargements the former appeared the better of the two, but he could not speak definitely as to this.

Dr. Foulerton said he thought the flame of the gas against wire would cause a very unpleasant smell.

Captain Abney stated that the flame against the wire would set up production of acetylene, a very unpleasant and noxious gas. He then conveyed the hearty thanks of the meeting to Mr. Traill Taylor for his interesting communication.

In the afternoon after members, friends, and visitors had met in the club rooms to see the exhibition of pictures and apparatus there, the Conference was continued at three p.m. by the reading of a paper on

THE SULPHURATION OF PLATINOTYPE PRINTS. (By H. H. O'Farrell.)

Mr. Willis showed that though the paper might be yellowed by sulphuration, a yellowing not difficult to remove, the image in platinotype was not affected. After perfect washing he had never succeeded in yellowing with H₂S.

Mr. Adeock dwelt on the beauty of platinotype and advised those present to "try platinotype and believe in it."

Captain Abney said the permanence of the image was independent of the discolouration by sulphuretted hydrogen. Silver prints could be as permanent as any other, but the organic sulphides formed in the albumen itself were the source of trouble. There were two forms of matter more permanent than any other—carbon and platinum.

The second paper at the afternoon sitting was

ISOCROMATIC PHOTOGRAPHY (by W. H. Hyslop),

and this was taken in immediate conjunction with an address by Captain Abney upon the same subject, in which he sought to demonstrate that orthochromatic plates would not be serviceable to the landscape photographer. He had come to this conclusion from a series of experiments

which he proceeded to explain to the meeting by means of diagram illustrations on the screen. The orthochromatic plates might be useful in taking white clouds on a blue sky, and in photographing sunset scenes, but for ordinary work they would be valueless. The blue must be reduced if orthochromatism is to be made of use. Instead of a yellow screen in copying work he used a hemispherical reflector painted yellow inside.

Some of the pictures taken by the aid of this reflector were thrown on the screen, and compared with others of the same subjects on ordinary plates, and exhibited very striking advantages in favour of those on the treated plates exposed to yellow light from the reflector.

At the conclusion of his paper, Mr. Hyslop made an important communication. He said the question had been asked at a recent meeting of the Photographic Society of Great Britain, whether paper negatives could be successfully treated with orthochromatising substances, as in the case of glass. He was able to answer this question in the affirmative, as he had with him some stripping films which he had successfully subjected to the process. These were handed round.

Mr. Burton regretted to hear the unfavourable conclusions Captain Abney had come to in regard to the use of orthochromatic plates in landscape work. He had been looking to a great improvement in results from their use, and was still unable to understand the marvellous superiority shown in certain landscape pictures from orthochromatic negatives over those of same subject from ordinary plates, except that this result was secured by the orthochromatising.

Mr. Wollaston asked which Mr. Hyslop considered his best result.

Mr. Mackie asked what plates Mr. Hyslop had used, bromide or bromo-iodide, and whether he had tried the effect of orthochromatising the chloride.

After remarks from Mr. Garnett and Rev. Mr. Lambert, Mr. Henderson being called upon by the President, said he had secured orthochromatic effect by use of vegetable dyes. He obtained the effect also without the use of yellow glass. He was not sure that they were not ignoring white light and making yellow light the high lights of the picture. He exhibited some orthochromatic photographs of diagrams containing blue and yellow.

Mr. Wollaston had used Clayton & Tailfer's plates with good results. He considered it was a great deal a matter of exposure.

Mr. Hyslop said that example treated with chloride of silver and erythrosine was the best. He did not think Mr. Henderson's tests were reliable as his diagrams copied contained only blue and yellow.

Captain Abney said he had seen the landscape pictures referred to by Mr. Burton. He could say those plates he had made would only show advantage in taking sunset scenes.

The last paper of the day was one sent by Mr. A. Pringle to be read entitled

RATIONAL DEVELOPMENT.

It was addressed "To my *Camarades* in Camera convened, to be read if convenient."

Captain Abney, in opening the discussion, said this would be the proper opportunity to discuss the Beach developer, as there seemed to be a desire to make an Aunt Sally of it at this meeting.

Mr. Burton approved of ten per cent. solutions, and marvelled at the prevailing habit of mixing the bromide and the ammonia in one solution. If you must mix it should apparently be the pyro and the bromide as these had acted somewhat in the same way.

Mr. Conrad championed ferrous oxalate.

Mr. Wollaston preferred potash to ammonia in developing negatives of dark interiors. With thick films, too, in certain brands he thought it much better, and on paper negatives he found potash greatly superior to ammonia.

Mr. Mackie said there was a tendency to get into a groove and use one developer for every make of plate. He considered this a most important point. Different brands of plates should have different developers. With Beach passable negatives might be produced on almost any plate, but not first-rate negatives.

Mr. Hyslop said, in regard to hydrokinone, that he had found the most wonderful latitude with it, exposures varying from sixteen seconds to more than a minute yielding results almost inappreciably different.

Mr. Burton doubted whether the same gradation of light was obtained with the use of ferrous oxalate.

Captain Abney noted that Mr. Pringle claimed lightness, *allegria*, from slow development; in music it was just the other way. The potash developer might be a good one, but Beach's modification was unscientific in the way it was prepared, in fact he might say it was childish: a chemist's shop which happened to develop. The additions to the pyro and the potash in it were decidedly injurious to the films of the negatives. Hydrokinone was better with potash than with ammonia. He thought there was the same amount of latitude with ferrous oxalate. The great objection to it was that it was expensive.

The Conference proceedings were then closed by a congratulatory address from the President.

In the evening the first annual dinner for members and friends came off at the Holborn Restaurant, Captain Abney presiding. Some excellent songs and speeches were given during the evening, and the company included representatives of the provincial societies, and of the photographic press, the whole numbering about eighty.

Our Editorial Table.

THE PHOTOGRAPHIC TIMES ANNUAL.
New York.

It is creditable to the enterprise of the Scovill Manufacturing Company that they should endeavour to have America adequately represented among the Annuals of the world. That for 1887 recently issued by this well-known firm is under the editorial management of Mr. C. W. Canfield, a former Secretary of the Society of New York Amateurs, who has had the good sense to get up the work on strictly English lines. It is well printed on stout paper and in large bold type, and contains a number of articles which will prove both interesting and useful.

PRACTICAL AMATEUR PHOTOGRAPHY.
By C. C. VEVERS, Leeds.

This little manual has been written as a simple text-book for the beginner. We can cordially recommend it for the purpose intended.

SUPPLEMENT TO CHOICE AND USE OF LENSES.

MR. DALLMEYER, following up his suggestion for the alteration of the Photographic Society's standard, made in our columns on September 24, 1886, has forwarded to us a list of his lenses with their respective diaphragms, all calculated upon the standard then proposed, and now adopted by him. For the guidance of those who possess the lenses with their diaphragms stamped according to the old arrangement, Mr. Dallmeyer has printed in the table the old notation of the stops. The diameter of each diaphragm, its intensity, ratio, relative rapidity, and comparison with the Photographic Society's standard, are all noted. The author, however, draws our attention to the fact that the apertures of the diaphragms of some of the smaller view lenses have been very slightly altered (beginning with lens No. 40,501), but the apertures of the stops of lenses before that number are exactly as given in the present "table of relative rapidities," &c., in the sixth edition of *The Choice and Use of Photographic Lenses*. The value of the table is increased by the fact of its being printed on one large sheet, so that it can be hung in the studio, or any section might conveniently be cut out and placed in a note-book, or even attached to the corresponding lens itself. Mr. Dallmeyer intends this table as a supplement to the pamphlet on lenses referred to, the enlarged edition of which we have already noticed.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 2012.—"Improvements in Printing Artificial Skies by Photography on to Photographs." G. J. SERSHALL.—Dated February 9, 1887.

No. 2024.—"Producing or Manufacturing Metallic Cameo Portraits." M. COBE.—Dated February 9, 1887.

No. 2042.—"Improvement in Photographic Cameras." J. R. GOTZ.—Dated February 9, 1887.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
February 21.....	Notts	Institute, 9, Shakespeare-street.
" 22.....	Great Britain (Technical).....	5A, Pall Mall East.
" 22.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 23.....	Burley and District	
" 23.....	Photographic Club	Anderston's Hotel, Fleet-street, E.C.
" 24.....	Burton-on-Trent	
" 24.....	Liverpool Amateur	Royal Institution, Colquhitt-street.
" 24.....	Oldham	The Lyceum, Oldham.
" 24.....	Hull	
" 24.....	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

At a meeting of the above Association, held on Thursday night, February 10, at the Masons Hall Tavern, City, London, Mr. A. L. Henderson presided.

The CHAIRMAN exhibited some pieces of a bromide print which had been bleached by Mr. F. M. Edwards with chlorine water, and which he (the Chairman) had taken home and put in a dish of water standing near a window; after a long time the chloride of silver blackened again in the daylight and the image had been for the greater part restored. He intended to do more with the pieces, and hoped to effect the complete restoration of the portions of the image.

Mr. URIE, of Glasgow, exhibited some rows of prints taken with his printing machine, to which, he said, a developing machine in its early rough stage had been fitted up as an adjunct, so that the prints were turned out at the rate of one thousand per hour from one negative; some other negatives worked at slower rates. When warm tones were desired seven seconds' exposure per print were given instead of one second. These mechanical inventions were likely to make photographic art of more commercial value and in new grooves.

Mr. B. J. EDWARDS thought that he was the first to point out that tones could be varied by varying the exposures; a long exposure and weak developer gave very red prints. He did not know that it was necessary to tone black prints at all.

The CHAIRMAN here exhibited some of Mr. Urie's rejected prints, which he (the Chairman) had toned after the original fixing and transformed into beautiful prints of great richness; he was doubtful, however, whether this final treatment with gold would not in the long run cause the gelatine of the prints to discolour. He had used about one grain of chloride of gold to twelve or twenty grains of acetate of soda rendered neutral by chalk and afterwards slightly acidified with a very minute trace of acetic acid; eight or ten ounces of water were used in the above toning bath to each grain of gold.

Mr. EDWARDS had brought home from New Zealand some prints most richly toned by a photographer there who used very nearly the foregoing formula, and all the prints toned in that acid bath had since faded, whereas prints toned in an alkaline bath had not done so.

The CHAIRMAN had turned out permanent prints after mixing sulphuric acid with the fixing bath.

Mr. A. HADDON asked if sulphocyanide of potassium, when used in tolerably strong solution, would dissolve gelatine.

Mr. W. M. ASHMAN said that a Belgian photographer had published that such was the case.

Mr. J. B. B. WELLINGTON had been trying more experiments with orthochromatic photography, until his plates had become so sensitive to red that printing went on through the red rim of Warnerke's sensitometer screen. Orthochromatic plates gave no halation, and in that respect were very valuable for interiors.

Mr. EDWARDS had found them to be remarkably good for varieties of foliage.

The CHAIRMAN said that Captain Abney had recently publicly stated that he thought that orthochromatic plates would not prove so advantageous as expected.

Mr. A. MACKIE remarked that Captain Abney based the foregoing statement upon the fact that most of the light reflected from leaves is white.

Mr. W. E. DEBENHAM had found orthochromatic plates to be particularly useful in photographing green colours.

The CHAIRMAN had stained plates with saffron, cochineal, litmus, and anatto, and they had all given orthochromatic effect irrespective of colour, because, as he supposed, they modified the high lights; the things he had named were not in the patent of Mr. Edwards.

Mr. EDWARDS said that the substances named had been used before, and he himself had obtained good results with saffron. The true orthochromatic effects were, however, produced only with a chemical organic compound of silver; the dyes merely helped, as in the use of yellow glass. The chemical method would in ten seconds give that which required one hour and a half by the optical method.

Mr. DEBENHAM stated that two years ago Dr. Eder had published that an emulsion might be made orthochromatic first and washed afterwards.

Mr. WELLINGTON had failed to retain the orthochromatic effect after the washing.

The CHAIRMAN asked what was Mr. Edwards's test for the use of eosine after the orthochromatic emulsion had been washed.

Mr. EDWARDS refused to answer. Some discharged aniline dyes could be restored.

Mr. WELLINGTON thought blue light was the best one in which to develop such orthochromatic plates as he had been preparing; blue gave the best protection for the purpose when testing with the sensitometer.

Mr. DEBENHAM said that blue light was bad to work by, because it had such feeble action upon the nerves of vision.

The CHAIRMAN's very sensitive plates for gaslight exposures were more sensitive to the red than to the yellow rays, and so were all ammonia emulsions; yellow-green screens acted best with them, as tested by experiment.

Mr. EDWARDS had been testing, and did not find orthochromatic plates less sensitive to the reds than were ordinary plates; sometimes they were a little better.

Mr. WELLINGTON's eosine plates gave worse results with the reds than did ordinary plates.

Mr. HADDON thought that the superiority of yellow over ruby light for the particular plates mentioned by the Chairman might perhaps be an error, the real cause of the difference being that with the yellow light a translucent and not transparent screen was employed, and that would greatly lower the general amount of transmitted light of all kinds.

The CHAIRMAN responded that he had always said that spectrum experiments were necessary to settle such questions.

Mr. W. Willis and Mr. C. Irving were elected members of the Association, and the meeting broke up.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

The ordinary meeting of the above was held on Thursday, February 10, at the Free Public Library,—Mr. J. A. Forrest (President) in the chair, with a fair attendance of members.

Messrs. Sylvester Parry (Chester), Alfred Matthews, and Charles B. Reader, were elected members of the Association.

Mr. FORREST wished to draw the attention of members to the weekly reunions held on Wednesdays, at four o'clock, at the Merchants' Café, 25, Lord-street, Liverpool. These meetings have been in existence some time, are quite informal, and have proved themselves a valuable adjunct to the monthly meetings, where, with so many things always on the tapis, a great deal neces-

sarily gets crowded out for want of time. He (Mr. Forrest) would be glad if the members of the Liverpool Association would co-operate with him in these "socials," and by their presence help to make them even more successful than they are; he wished to be permitted to extend the right hand of good fellowship to the Liverpool Association, and, if invitation was considered necessary, he invited them most heartily, as he felt the two Associations should fraternise more than they did, and especially so with regard to the excursions, which he thought might be arranged for the mutual pleasure and convenience of all.

After some discussion, it was resolved that silver and bronze medals shall be awarded at the next competition in lieu of the prizes of prints hitherto offered, as it was felt the medals would act as an incentive, and induce members to take part more largely in the various competitions.

Mr. P. Lange exhibited an excellent 12x10 enlargement from a half-plate negative, printed in platinum, of two beagles (not the biped species), which were greatly admired.

Mr. H. H. Williams exhibited some whole-plate Woodbury tissue negatives and prints therefrom; in the latter there was no perceptible trace of granularity whatever.

The Secretary also showed a large number of prints taken during a ten days' holiday in the Mourne Mountains, North of Ireland, last Christmas, which helped to illustrate some of the beauties of this photographically forsaken part of "that most distressful country," where a camera still excites as much interest as an express train would to an Esquimaux.

Mr. A. W. BEER then read his paper, *A Holiday in the North Riding; or, On the Trail of the Artists*, which was listened to with attention, and, by the frequent bursts of applause bestowed upon it, his audience were evidently alive to the trouble and pains he had taken to make it interesting with camera and pen.

The first scent of the "trail" is found at Whitby, i.e., the east side, or Old Whitby, the western portion being modern and fashionable. Whitby and jet are terms as synonymous as coals and Newcastle, but fashion and lack of supply have sadly interfered with this part of its once staple trade, and it is only at Haggerlyth we are introduced to a few of the houses once occupied by the miners, now sadly out of the perpendicular owing to a late landslide. Whitby Abbey, built A.D. 657, is as full of pictures as it has quaint legends connected with it. The Fish Market affords some interesting figure studies, as Mr. Du Manier has found out and illustrated with his versatile pencil. The curious but ugly old Tanean Town Hall reminds us of the primitive place we are visiting by still nightly ringing the curfew. Whitby's once proud whaling fleet, now reduced to dry-rotting in the sun, afford interest to many of the views to be found on the shore. Along the cliffs now to Sandsend, close to which are the great demans of the Marquis of Northampton, who affords every facility to artists, who find plenty of work on the remains of the once feudal stronghold, Mulgrave Castle. Scrambling along the cliffs, noticing the old jet mines in their face on the way, on past what is left of Kettlewell, wonderful Runswick is reached, where the houses seem to form part of the cliff itself; it is in every sense a place of negatives, as here there is no church, no chapel, no horse, no cart, no policeman, no post office, no graveyard, no public-house, no photographic society, no social board, and, as a natural consequence, no rates. Still along the cliffs to Staithes, which is larger than Runswick or Sandsend. Here Captain Cook was apprenticed to a grocer, but the house has been claimed by the sea some years ago. A mile up the Esk, and Runswarp is reached; then from Eton to Glaisdale, where every possible variety of river scenery may be had, on to the Beggar's Bridge, which is 200 years old, and is said to be a veritable "Lovers' Bridge" owing to a legend, but one is more prepared to see Tam o' Shanter pursued by Chitty Sark than lovers on it, so closely does it resemble the Brig o' Doon. Six miles south of Whitby, St. Robin Hood's bay and town are reached, and afford many capital "bits," but its quaint beauty is doomed, a grand hotel being about to be built on the cliffs. The train now whisks us away through the Vale of Pickering, and we notice en route Pickering's ruined castle, Kirkham's famous caves and old church, to Helmsley, where, amidst the fine trees of Duncombe Park, towers the venerable Keep of Helmsley Castle, which was destroyed by the Parliamentary Vandals of A.D. 1644. In a corner of the castle yard remains the square mullion-windowed building said to have been the residence of Villiers, Duke of Buckingham, where he retired after disgrace at Court. Close to Helmsley is the Monastery of Rievaulx, which is full of pictures, and the ruins of which are most extensive—indeed, in the parlance of a countryman, "There's acres of 'em." From Rievaulx we reach Scawton and Byland Abbey, on to Coxwold village, owned by Sir George Wombwell, of Balacrafa fame, and visit in the neighbourhood Shandy Hall, where Lawrence Sterne lived for seven years as vicar, and wrote many of his best-known books. Through some lovely country, we reach the end of our journey, namely, Durham [some lovely slides of which "brought down the house," and "our guide" was thanked by acclamation, without even the more formal vote of the President].

Mr. Beer, who took the late prize at the Liverpool Association for lantern slides, illustrated his paper with over a hundred views, reduced from 10x8 negatives, many of them most artistically coloured, which increased their beauty considerably.

Mr. Cornish manipulated his lantern without a hitch, and had a brilliant light. A very hearty vote of thanks to him broke up the meeting at a late hour.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the usual bi-monthly meeting held at Myddelton Hall, Islington, N., on Tuesday, February 15, Mr. J. Traill Taylor, President, in the chair.

The HON. SECRETARY read a communication from Mr. F. B. Taylor referring to the negative shown by Mr. F. W. Cox at the last meeting.

The following gentlemen, who were members of the original North London Society, were nominated by the Council as honorary members:—Messrs. W. Ackland, W. Bedford, E. Dunmore, E. W. Foxlee, D. W. Hill, J. Martin, and G. Shadbolt; and the following as ordinary members:—Messrs. H. Dimmock and H. Inray.

Several presentations were made for the Society's library. Mr. TAYLOR, vacating the chair, which was taken by Mr. A. Mackie, Vice-President, then delivered a lecture on the characteristics of the photographic lenses in everyday use. Commencing with the portrait lens, he explained the great influence of the back combination not alone in conferring intensity of the image by shortening the focus, but especially in flattening the field, showing by what means a round field could, by a slight modification, be rendered flat. Such defects as astigmatism, and not working to focus, were treated of, and remedial measures indicated, together with the best position for placing the diaphragm in order to secure certain ends. The employment of this lens for

lantern projection was dwelt upon at some length, and the conditions for obtaining the best marginal definition on a flat field pointed out. Modern single achromatic landscape lenses next claimed attention, and it was shown that for certain classes of large heads these would prove very useful. The conditions under which such lenses would give a soft definition coupled with rapidity of action were shown, and an explanation given of the means whereby the front lens of a portrait combination could be used alone for portraits of large dimensions as well as for landscapes. The class of doublet lenses known as rapid claimed a large portion of the speaker's attention during his discourse. He explained by what means the flattest possible field could be obtained while using a large aperture, and dwelt at some length on the flare spot in the centre of the field, to which so many of these lenses were liable when employed out of doors with a small stop, explaining cause of this fault and showing the means by which it could be cured without affecting the working of the lens otherwise, and further explaining by what means the rapid doublet could be converted into a wide-angle lens. But, he said, while a good rapid doublet might be made to embrace a wide angle by having a supplementary short mount, an originally wide-angle lens could not be converted into one working with great rapidity. The subject of comparing and testing lenses, the employment of the single parts of compound lenses for landscapes at long ranges, the care of lenses, conjugate foci, and other topics of a practical nature, including that of the best form of mounting lenses, all received their meed of attention during the discourse, which lasted over an hour, and during which several lenses of various forms were exhibited.

The VICE-PRESIDENT said he felt sure he was expressing the feelings of every one present as well as his own in saying that he had been gratified as well as instructed by the President's able and interesting discourse. He hoped to have an animated discussion, and felt sure Mr. Taylor would answer any questions and explain anything that he might not have made clear.

Mr. P. SPENCER said that he should like Mr. Taylor to explain the reason of the existence of both chemical and visual foci in some lenses.

The reason of this Mr. Taylor then demonstrated on the blackboard.

Mr. F. W. Cox believed that many years ago Mr. Taylor showed at the Photographic Society of Scotland a lens he had made to give diffusion of focus at will, and asked whether there was any lens made that would give such diffusion of focus. He thought such an one would give very artistic effects.

Mr. E. DUNMORE had taken pictures with a Dallmeyer's portrait lens in which this quality could be obtained by separating the back combination.

Mr. J. T. CHINN asked whether there was any rule for fixing the distance of the stop from the lens in single lenses.

Mr. TAYLOR said that no rule could be laid down. The best position of the stop could best be fixed by a system of trial and error.

Dr. LINDSAY-JOHNSON asked why some makers made the lenses of their wide-angle rectilinears very small while others made them so much larger.

Mr. TAYLOR explained and demonstrated that in the former case the same results are obtained by using very thick lenses, which in the latter was obtained by using thin ones of larger diameter.

Mr. F. W. HART spoke on the subject of flare spots in single lenses.

After some remarks by Mr. George Smith and others, and owing to the lateness of the hour, the discussion was adjourned until the next meeting on Tuesday, March 1, which will also be a lantern evening.

The proceedings terminated with a hearty vote of thanks to Mr. Taylor.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The usual fortnightly meeting was held at the Technical Schools, Bridge-street, Birmingham, on Thursday, the 10th instant,—Mr. E. H. Jaques in the chair.

The minutes of the last meeting were read and confirmed.

Mr. Frank Edwards was elected a member, and Messrs. Leeson and Hoskins were nominated for election.

The evening was devoted to a lantern exhibition of slides for a prize given by an anonymous member for the best slide shown on the screen, Messrs. Birkett, Button, Collins, Fowler, Dr. Harts, Harrison, Holliday, Jaques, Karleese, Middleton, Pickard, Pumphrey, Riley, Robinson, T. Taylor, R. P. Taylor, and Tylar, competing, the result being that fifteen slides were selected as the best, which are reserved for the final decision of the judging committee.

Some very fine slides, not for competition, were also shown by Messrs. Barwell, Heaton, Pumphrey, and Welford, which were much admired. About two hundred slides were shown.

The meeting was most enjoyable, and it was decided to promote similar exhibitions during the year.

The subject of next meeting will be *Developers and Rapidity*.

YORKSHIRE COLLEGE PHOTOGRAPHIC CLUB.

The ordinary monthly meeting was held in the College on Friday, February 11,—The President (Mr. C. H. Bothamley) in the chair.

The President showed some specimens of orthochromatic photography.

The Rev. R. W. ATKINSON, M.A., gave a lecture entitled *Here and There in Norway*, which was illustrated by a large number of very fine lantern slides.

A vote of thanks to Mr. Atkinson, on the motion of Mr. W. THOMAS, seconded by Dr. E. H. JACOB, concluded the proceedings.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 9th instant,—Mr. George Bankart, President, in the chair.

Mr. B. Smith was elected a member.

Mr. T. S. TAYLOR, assisted by Mr. W. TAYLOR, then proceeded to give a paper on *Lenses*, which was illustrated with several experiments and demonstrations, assisted with diagrams thrown on the screen by the oxyhydrogen light. Mr. Taylor first showed the effect of interposing a prism and prisms in

the path of a ray of light, demonstrating the deflection caused thereby, and with numerous diagrams he showed the various angles and foci determined by lenses of different shapes and densities; explaining the reason, by practical examples, for using a combination of lenses composed of glass of different composition, as flint, crown, &c.; and, after showing practically the formation of portrait, rectilinear, and other combinations, he closed by showing the various stages of manufacture from the rough glass to the finished lens, which, being a new experience to the members, was thoroughly appreciated and enjoyed.

CHELTEMHAM PHOTOGRAPHIC SOCIETY.

MONTHLY meeting held February 10.—Mr. Baynham Jones in the chair.

The SECRETARY exhibited some prints on Liesegang's "Aristo" paper, stating that he found a difficulty in toning it satisfactorily. He had first tried the ordinary borax bath, which produced no effect; the next batch were toned with a bath containing ammonium sulphocyanide and sodic phosphate, and the results were better, but not quite satisfactory.

Mr. Jones showed Vergara's slide for the Woodbury tissue and a transparency printed on a Woodbury film. This was quite free from any appearance of granularity.

The Eastman Company had sent for exhibition some specimens of enlargements on their bromide paper, and also some negatives taken on their new stripping paper. These latter were very much admired, being as clear as glass, and showing a marvellous amount of detail.

A vote of thanks was passed to the Eastman Company and to the Woodbury Tissue Company for their exhibits.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

AN ordinary meeting of the above Association was held on Thursday, February 3, in the South Glasgow Exhibition.

The PRESIDENT, Mr. W. Lang, jun., occupied the chair, and explained to the members that it had been thought advisable to hold the meeting in the Photographic Exhibition, as it would close on the 5th instant, and by doing so they would have an opportunity of again examining this most interesting collection. This was the reason of the change of place of meeting. They were indebted to Mr. Paton for putting a room at their service, and he thought the Association could not do less than accord to Mr. Paton a very hearty vote of thanks for the many facilities he had allowed the members during the time the Exhibition had remained open.

The minutes were thereafter read and confirmed.

A letter was read from the local Secretary of the Photographic Convention Committee, but it was agreed to hold consideration of the same over till next meeting.

A number of Eastman prints by M. Nadar, Paris, and sent to the meeting by Messrs. G. Mason & Co., Glasgow, were passed round and greatly admired, a conversation taking place on the merits of the Eastman and kindred argentic papers.

Mr. URIE said that this process of printing was sure to come to the front. It had three distinct qualifications over albumenised paper, namely, it was cheaper; it was quicker in printing, over two thousand a day being printed easily; and it was permanent. In the pictures before them he thought, however, the deep shadows might have had more of an engraving black about them, and this could have been got by having the shadows in the negative clear glass.

Mr. PATON did not know that it would have improved the pictures to have them blacker in the shadows. He had always found that they had a much softer and pleasanter effect when the shadows were not too dark.

Mr. URIE said he did not mean that the picture should be hard, but what he wished to show was that the blacks in these pictures were dull and flat, and what an artist would do were he working up one of them would be to brush over the shadows with gum or varnish, so as to make them more brilliant. This, however, that an artist would do could all be done by having a proper negative and developing carefully.

Mr. G. BELL said it was wonderful how good an enlargement could be produced on this paper from a very inferior negative. He had occasion to take a group rather late in the afternoon, when most of the light had gone; instead of wasting a large plate, as he knew it would be useless to attempt a large size, he used a quarter-plate; the resulting negative proved almost useless, giving an exceedingly poor print on albumenised paper; yet this same negative, when placed in the lantern, yielded on argentic paper an extremely good 18x14 enlargement.

After some further conversation, a vote of thanks was given Messrs. G. Mason & Co. for allowing the members an opportunity of examining these beautiful pictures.

The CHAIRMAN then asked the Secretary to read his paper, entitled *Some Photographic Illustrations from the Works of O. W. Holmes*.

At the close the Secretary was awarded a vote of thanks, and the members then proceeded to go over the Exhibition and examine the different exhibits, and thereafter the meeting separated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The fourth meeting of the current session was held on February 2.—The President occupying the chair.

Five gentlemen were elected ordinary members, and four nominations were made for election in March.

Mr. WILLIAM CROOKE read a paper on *Photographic Portraiture* [see page 101], which elicited considerable discussion amongst the professional members.

Mr. J. M'KEAN said the usual preference was for a north light in the studio, when it could be got, but he was compelled often to make use of a south light, and found it quite suitable except in brilliant sunshine.

Mr. F. MOFFAT thought the suggestion to use tissue-paper as an aid to the proper lighting of deep-set eyes a good idea.

Mr. J. HOWIE thought the idea of several preliminary sittings being given before a large work was undertaken ought to find favour and recommend itself. Photography was distinguished for a realism and truth which were not at all times picturesque, still these qualities were so valuable that they alone were sufficient to make our art ever hold its own.

Mr. H. BIBBS said he used at times as a reflector a screen covered with reddish blotting-paper. It conveyed a soft flesh-coloured light to the face.

Mr. W. T. BASFORD said the hints given were very useful, but like other good rules, had their exceptions. Each sitter requires to be considered on his own merits, and peculiar cases will run counter to all ordinary rules.

Mr. FORGAN referred to Mr. Crooko's remarks upon the eye as conveying mainly the expression of the mind, so that, though the lower part of the face were hid, the eyes alone would tell what passion ruled at the moment. He thought that, expressive as the eyes were, it commonly needed all the features to unmistakably interpret mental emotions.

Mr. WILLIAM HUME showed how a quite efficient enlarging apparatus could be improvised out of an ordinary packing box, by making a few simple adaptations. He also exhibited a number of gelatino-bromide enlargements made by it. The means by which the sensitised sheet was placed in the exact position desired, after focussing, was ingenious. Three drawing studs were placed in a triangular form as guides, and the paper placed quite up to them and fixed there. Mr. Hume used a condenser, but no reflector.

Mr. FORGAN recommended that a large portrait combination should always be preferred to a rapid rectilinear, in enlarging, because of the more general illumination it gave.

Mr. TURNBULL said that when lamp flames were employed they should be set edgewise to the lens; large spread flames did not do so well.

Mr. ANNAN and Mr. CRAIG-CHRISTIE each exhibited one photograph containing phantom images, but which was positively declared by their respective authors to be the production of a single exposure.

A good deal of discussion ensued, and many explanations were offered, but nothing which was satisfactory—at least to the producers.

The meeting was brought to a conclusion by a distribution of over seventy photographs by ballot to the members.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE usual monthly meeting of the above Society was held on Friday last, the 11th instant, in the Royal College of Science, Dublin.—Mr. S. Baker in the chair.

After the reading of the minutes Mr. Greenwood Pim exhibited a novel changing bag, which was nothing more nor less than a light black indiarubber coat. This he buttoned down the front and laid on the table buttons down, then doubled the sleeves and tucked them under, then with two little elastic bands, one round the neck and the other round the tail, both bands could be inserted light-tight as well as the box of plates and dark slide, and the plates changed by feel alone.

Mr. Meldon also showed a bag which he was in the habit of using, and which had a small window of red stuff in one side and a couple of eye-holes fitted in a face-piece, which was held close to the face by an elastic band, so that plates could be changed by sight.

Mr. J. L. ROBINSON then read his paper, entitled *A Week in Kent*, after which a number of photographs which he took on the excursion were passed through the lantern.

The report of the judges of the pictures sent in for the competition in work done last season was received, and the two medals were awarded, the one to George Mansfield, for his picture, *Old Street in Saltes Basses, Pyrenees*, and the other to Dr. Brown, for *A River Scene*. There were a very large number of pictures sent in for the competition.

A vote of thanks to the judges, Dr. Hayes and Mr. Longfield, was proposed by Mr. PIM, and passed unanimously.

Correspondence.

Correspondents should never write on both sides of the paper.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITORS.

GENTLEMEN,—May the Committee again trespass upon your courtesy for space to notify photographers that the Annual General Meeting of members has been fixed for Monday evening next, February 21, at 181A, Aldersgate-street, E.C.? The chair will be taken at eight p.m. by J. Traill Taylor.

It is further desirable to mention that much useful work, within the legitimate scope of such an Association, has hitherto been but partially carried out, owing to the limited number of subscribers, whose position rendered it unlikely for them to tax the Society's resources. Suffering and misfortune has not been absent in circles photographic, but in the majority of cases that have fallen under the notice of the Committee the essential qualification of membership was absent. The feeling has grown that an annual payment of 10s. was beyond the capabilities of many whose earnings are often slender and variable, and that the Society would be of greater general benefit were subscriptions lowered in order to embrace all conditions of workers—namely, 2s. 6d. per annum. This innovation, which the Committee regard as a bold experiment, has now been brought about, with the result of adding at least fifty members within a very short period.

Non-members are invited to be present and take part in the discussion, but members only are entitled to vote.—I am, yours, &c.,
February 14, 1887. H. HARLAND, Secretary.

ORTHOCHROMATIC PLATES IN LANDSCAPE PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—In your editorial note of last week referring to Captain Abney's remark that the real use of isochromatic plates will be in the copying of paintings, you go on to say, "Are not paintings transcripts of nature, not only as regards drawing, but also colour?"

I think you rather misunderstand what Captain Abney *did* say. Will you allow me, as one also present at the meeting, to explain what I understood to be Captain Abney's meaning? He showed that all coloured objects, and even black objects, reflected a certain proportion of white light. It is this white light that in landscape photography impresses the image on the plate. The coloured rays, *within the narrow limits of time in which a landscape picture is taken*, have no sensible effect on the plate. In copying pictures the conditions are different. A protracted exposure is given, and yellow light or a yellow screen is used.

The coming season will doubtless solve the question. Meanwhile, I would like to draw attention to two facts: (1), that a plate treated by Messrs. Dixon's method is two or three times *faster* than the same plate untreated; (2), that in copying pictures *by daylight* the orthochromatic plate, even *without* a yellow screen, gives an indisputably better result. These facts would seem to cast some doubt on Captain Abney's view.—I am, yours, &c.,
H. H. O'FARRELL.

To the Editors.

GENTLEMEN,—Will you kindly allow us space to correct one or two inaccuracies in Mr. W. H. Hyslop's paper which appears in your last number?

Mr. Hyslop assumes that "had Messrs. Dixon not issued their plates the Tsilfer patent would not have been so much heard of," and that we should not have purchased our English interest in it. As a matter of fact, negotiations for the English licence were commenced as soon as we were convinced that the patent was a valid one in this country, now more than a year ago, and the purchase was practically completed long before the plates prepared by Messrs. Dixon were put upon the market. It is to be regretted that Mr. Hyslop did not take the trouble to ascertain the facts before making his statement.

With regard to Mr. Hyslop's assertion "that our isochromatic plates will give no such effect without a screen," we have only to point out that all the examples shown by us at the meeting of the Photographic Society of Great Britain were taken in ordinary daylight without a coloured screen of any kind. This conclusive fact was stated at the time, and can easily be demonstrated by any one who chooses to make a simple experiment.

Mr. Hyslop's paper contains many other statements which, to say the least, are misleading, more especially in the description of his failures, which in every instance he attributes to his chemicals, instead of fairly ascribing some share of his non-success to his own confessed want of chemical knowledge of the subject.—We are, yours, &c.,
The Grove, Hackney, February 14, 1887. B. J. EDWARDS & Co.

AMATEUR PROFESSIONALS.

To the Editors.

GENTLEMEN,—Mr. Adeock in his remarks on my letter seems to put a pointed reference to a *clerk* amateur becoming a professional that I did not quite mean. I have been a clerk, and wish no offence to that useful class; it was just a handy name. I might as well have said baker, brewer, night watchman, barber, signalman, joiner, teacher, or anything else, and I happen to know all these; and what I call them is amateur professionals, because they make profit out of the practice of the art-science. And I do not object to any one becoming full fledged professionals. It would not become me to do so. I had my time of honoured amateurism and of successful professionalism, and should I get into the sere and yellow leaf of an old duffer, I must just take it, but will try to keep that off as far as possible. That does not keep me from thinking that it would be well for those who acknowledge themselves professionals to have a society of their own for trade purposes in the widest sense. Our societies and our journals used to be for the advancement of the photographic art, and all who took an interest in it became members; now fine lines and blurred lines are being drawn to separate the amateur from the professional. Whether my sight is failing in such matters I don't know, but I cannot find much difference yet, and think all might sit on the same benches and read the same journals. But purely business affairs might well be discussed by professionals themselves by themselves. The amateurs are particular to disengage all things affecting them. Then their journal with its pictures, its prizes, &c., carries on the work, all well in its way, and with an editor who is evidently an amateur in many things. He can distinguish what an

amateur and professional might do on Sunday, and can say what is wrong in newspaper and Government interference with an officer using his camera at an execution, and can tell about what the magistrate should do about lent pictures and nude pictures, in fact, he seems lawyer, theologian, legislator, artist, and critic all in one. So, Gentlemen, I say professionals ought to have a trades union of their own; and I again commend your leader to the consideration of those who live by photography.—I am, yours, &c.,
Glasgow, February, 1887. ARCHIBALD ROBERTSON.

"SULPHURATION OF BROMIDE AND PLATINUM PRINTS."— A REPLY.

To the Editors.

GENTLEMEN,—I will now deal with Mr. Andrew Pringle's remarks on platinotype, which appear in an article in your issue of January 7, but before doing so will suggest that it is a pity that he did not deliberate longer and more anxiously, as he puts it, before writing the article.

First let me deal with the title of the article, and then I will go on to answer the salient points in the body of the paper, indicating them by stating paragraph and line.

Why does Mr. Pringle *himself* term prints made by the platinotype process "*platinum*" prints? He says they are but slightly composed of platinum, and it cannot be that he should say that he is using the accepted title, because the accepted title is "*platinotype*."

Third paragraph, fourth line.—I have used the term "*absolute permanency*" because some have affirmed that a print may rightly be called "*permanent*" which will last twenty, thirty, or perhaps fifty years, and no longer. Now, I own that such a process would be a vast gain upon albumenised paper, especially if any of the periods could be *insured* in the case of each print carefully treated in the making. But while such a process would be valuable, if otherwise good, there are other processes which can give an image—a deposit in half tones—"absolutely" as "*permanent*" as the paper itself; and to these I give the term "*absolutely permanent*"—it has been often used and accepted—to differentiate from the "*permanency*" of some writers of the present day.

Carbon and platinum are known to be not only unassailable by sulphuric acid, but to pretty well every chemical and treatment besides. It is, further, of some value that these bodies are more lasting than paper, because we have all the more assurance that they will not from some accident fall us in the most important records which it is intended to preserve.

Then, as to the "*white*" support, which in another sense forms a part of the "*image*," we want proof or evidence that it, too, will not alter sufficiently to spoil the picture during the existence of the paper (at least that the paper support shall be as good as any other paper of same age). Now, did all platinotypes behave as Mr. Pringle's prints have done, it might look bad for the future appearance of the lightest parts of the prints. But it has been proved over and over again that a properly produced platinotype (*the conditions are known*) is not affected by sulphuric acid, or by many other chemicals.

Despite Mr. Pringle's assertion, I will say that a "*permanent image*" on a not "*decayed*" but degraded sheet of paper, *is better* than a "*fading image*" upon a "*permanent*" sheet of paper, and this not only in an artistic sense (it is even *certain* that some prefer the prints which have impure "*whites*"), but in a scientific one also. Who would care much in A.D. 2000 whether certain prints representing, say, London scenes and life as it was in A.D. 1887, were not quite immaculate, or far from it, in the "*whites*?" But if every face showed only what looked like little holes in a mask, what boobies they would think us for not having used the more permanent methods of printing! The inscribed tiles of the ancient Egyptians are not, if we come to word-splitting, "*permanent*;" but as I have stated elsewhere, many terms we use do not bear very rigid dissection, but we all know the significance of them.

Fifth paragraph, ninth line.—My "*trilogy of letters*" (how grand! Mr. Pringle has nearly enough matter in his *one* article for a so grand a thing as a "*trilogy of letters*!") contained some very sound arguments, though Mr. Pringle may think it may prove "*riling*" to state the contrary. A metal in fine division is known to chemists to be more readily attacked by chemicals which can combine with it than is the metal in the "*lump*." Silver and zinc are granulated for dissolving; platinum dissolves with fearful energy in warm *aqua regia* when in fine division, but quite slowly when in "*lump*." And it is always found that the chemical which will affect a metal in the "*lump*" will also affect it in the powder, and generally *vice versa*. Hence I say, if silver in the lump is attacked by substances, so also is silver in fine division; and from what we know, the effect may more rapidly take place in the latter than in the former case, though I do not press that part of the subject.

I intend that there is "*analogy*" between silver in the "*lump*" and precipitated silver, though a hundred Mr. Pringles stated the contrary. "*Analogy*" is defined in my dictionary (edited by a Scotchman) to be "*an agreement or correspondence in certain respects between things otherwise different*." There is some bond stronger, perhaps, than "*analogy*" between the two forms of silver; if so, all the better for my argument. I know that persons have put forward a supposed tarnishing of platinum coins as analogical evidence against platinotype.

And they would have had a pretty strong case against it, but for the unfortunate fact that platinum coins do *not tarnish*, but are often very dirty from lying about. They are not now coined in Russia. So much for argument and "analogy." But stay a moment. What has Mr. Pringle to say to the "analogy" of the surface of my negatives (not printed from) suffering alteration in impure air in a year or two? If the image of a negative alters, why not that of a positive? Perhaps there is no "analogy"—perhaps so—it is *sameness*. I do not give any reasons (like Mr. Pringle) or one reason only, but speak out according to my knowledge, and support my statements by facts which are most suggestive—they are not put forward as proof.

If autotypes were "not uninfluenced" by the treatment accorded them, why does Mr. Pringle dismiss them with so much honour and good report? Have not autotypes, as well as platinotypes, been asserted "long enough" to be "permanent," so that "persons have come to believe and to assume the thing stated?" Mr. Pringle, "saucer for the goose is sauce for the gander." I do not write this wishing to egg Mr. Pringle on to saying anything against the prints of the Autotype Company, but merely to show how biased and one-sided he is. It would be more dangerous, too, to venture against the older autotype process than to attack platinotype—that patented anathema.

Seventh paragraph, third line.—Mr. Pringle really deserves a regular flagellation. He knows as well as I do that the platinotype process is not known as "permanent" just because the Platinotype Company have asserted it to be so. Yet this is what he would have his readers believe. Such men as Captain Abney, Mr. John Spiller, and M. Vidal (see JOURNAL for December 31), believe it to be a thoroughly permanent process—as far as any yet known. Besides, he imputes to the Platinotype Company in their "successful assertion" something like dishonesty; for can he suppose that the Company do not know as much of the behaviour of the prints in sulph. hyd. as he does?

Ninth paragraph, sixth line.—Mr. Pringle states very charitably that I was "assuming everything . . . to suit" my "own argument," and "without the least apparent consideration as to whether" my "foundation is firm or not." Now I don't know that any milder term or expression is applicable to this statement than the one that it is a "thumping lie." I suppose Mr. Pringle tries to make out that I stated that certain chemicals absolutely *do* affect in the ways instanced in respect to "lump" silver, the bromide prints. I wrote nothing of the kind (this kind of disclaimer, as Mr. Pringle would say, for the "twentieth time"), but simply to the effect that our knowledge of these effects on silver in various forms gave pause to the *absolute assertion* of "permanency" of the bromide prints.

Eleventh paragraph.—And now we come to the wonderful experiment, the result of which has made platinum "pop in" and silver "pop out!" By the way, I do hope that his sulph. hyd. was *pure*, and that no trace of sulphuric acid or of iron contaminated it; I suppose there could have been no "copper!"

First of all, Mr. Pringle "catches" his platinotypes, and then proceeds to "cook" them. However, instead of making them himself with his "usual care," he procures two prints from different workers, and presumes that they are creditable examples of the platinotype method, treated in such a manner (according to directions, supplemented, where directions are not applicable, bulk of baths, &c., by common sense) that the sensitising and other salts have been removed during "clearing" from the paper.

Twelfth paragraph.—Two sentences, if they mean anything to speak of, would seem to be another attempt to place me and my statements in an untrue and unfavourable light. Mr. Pringle says "it will take a good deal to make me" (himself) "think otherwise" (alluding to the greater stability of bromide over albumenised prints), and "Mr. Berkeley may wish to continue the test, but I do not." Now Mr. Pringle's belief has been my opinion all through my writings, and is foreshadowed in the sentence Mr. Pringle himself quotes, "Let the statement go forth," &c.

Thirteenth paragraph.—Mr. Pringle made bromide prints with his "usual care." (He says with "probably less than usual care," but then explains that they were "*under exposed*.") He treats them with sulph. hyd., and finds, he says, no visible effect. But will Mr. Pringle aver that the "image" has not been converted, or partially so, into silver sulphide? He treats the platinum prints in a similar manner, but he will not, I presume, tell us that the "image" (commonly called "platinum") underwent any change whatever. Presuming this to be so, the evidence is, from this point of view, more favourable to platinotype than to the bromide prints.

But presuming a silver sulphide image is formed, I am not by any means sure—when this means for forming it has been taken—that the image has lost any of its stability by the change. It is not that sulphide of silver is particularly unstable (the sulphurising method of intensification with "liver of sulphur" (pot. sulphide) has been rather favourably known in that connection for many years past); the danger, I take it, in—what I may call—"natural sulphurisation" is that the image may be affected differently so far as to produce different and uneven tints.

However, I am not now, any more than previously, going to say that such and such effects will take place. I merely point out, in the absence of proof or of evidence of permanency, that the fact of an image being liable to attack from very various chemicals (this, by the way, not being the case with the platinotype "image") forms ground for grave doubts

as to that stability some of us know by the term "permanency." This is nothing more nor less than the line of argument that was—or would have been—taken by disinterested persons in the case of platinotype, had it not stood the tests applied to it by a skilled chemist and others. It is precisely on account of the result of such experiments that the platinotype process was able "from the outset" to be termed "permanent," with only the occasional demurrer of men of peculiar views, like Mr. Pringle. But men can be found to demur to everything, even to stating that the world is not "round" but flat. However, the question at issue is not the characteristics of platinotype but of bromide prints, and Mr. Pringle will not "whitewash" the one by "blacking" the other. The only reason why I have imported platinotype into the question, is that I wished to show that in all fairness the approved method of testing prints for claim of "permanency" at the "outset" of a process should apply to bromide prints equally as to platinotype prints. The origin of the argument is *not mine*, but is due to "disinterested amateurs" and others.

Fifteenth paragraph, third line.—Why does Mr. Pringle assume that had he used the sulphurous acid stronger the platinotype would, he "dare say, have gone wrong?" And this after so much preaching on the subject of alleged assumptions. His object must have been to show his impartiality; but he does not succeed—not quite! Mr. Pringle then (fifth line) passes over a test or two *not* favourable to bromide prints, and proceeds to say that "sulphuration was Mr. Berkeley's cry;" so it was, but it was *not* my only cry, neither do I confine myself to one mode of sulphuration.

Nineteenth line.—If the face of the prints is more discoloured than the backs, one of two things would appear to be indicated: either that the prints were cleared for *too short a time* (overworked baths is the *usual* cause of improper clearing), or that the paper when cleared was old or partially decomposed (ferric chloride). However, I make this statement under a certain reserve, not knowing the facts, nor having seen the prints.

Sixteenth paragraph, fifth line.—"Damp, I am always told." Indeed! O just judge and truthful witness! Do you not call to mind that you have been told that no doubt your *negatives* have had much to do with the dull, flat character of your prints? Do you not remember that there was a suggestion that you should send two or three negatives to the Platinotype Company so that they might be tested? And are you not aware that you have not availed yourself of the offer? I allude to this little episode because it shows the spite of the words, "Damp, I am always told." Seeing that others succeed with the paper supplied to them, the inference is that the "usual care" of Mr. Pringle is not sufficient for working so simple a process as the printing and development of platinotype paper. This is the inference derivable from the words; but I think better of Mr. Pringle's ability to do all necessary (except apparently the negatives) than I do of his boasted impartiality.

Seventeenth paragraph, second line.—It is satisfactory to know that Mr. Pringle "maintains" that platinotype prints are "permanent," even though he classes them after bromide prints. But then, what is "permanency?" It appears to be like "truth—hid in a well." After writing what he does in the twelfth paragraph, he proceeds to tell us that "even albumen silver prints may, perhaps, be called 'permanent,' so far as sulphuration is concerned." How funny it all is!

Eighteenth paragraph.—Is not the positive assertion of permanency made by the manufacturers of the bromide paper "supposititious speculation?" I neither have made a positive statement nor condemned any products whatsoever. There is here room for the parable of the "mote" and "beam"—but, no; not in your pages, Messrs. Editors!

Nineteenth paragraph.—I will just hint to Mr. Pringle that chlorine is found in the air; also sulphuric acid; and also ozone.

And now, having stated that any future tests will not affect what he has written, he proceeds, in the postscript, to inform us that the first bromide prints tested (the "under exposed" ones) were less pure in the "whites" than a print subsequently tested; and that "this time the bromide print has suffered more deterioration than the platinum ones" (how fond he now is of calling platinotype "*platinum!*"). It appears, then, that in the case of the "first prints" the discolouration produced may have been *masked* by an original dinginess of the "whites." If so, much of Mr. Pringle's assertion falls, for the present, to the ground—even from his own point of view.—I am, yours, &c.,

HERBERT B. BERKELEY.

San Remo, January 15.

Exchange Column.

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

Wanted, good view lens in exchange for a revolving stereoscope.—Address, W. SAUNDERS, Dickleburgh, Scole.

Will exchange three oil paintings for whole-plate or 10×8 bellows camera.—Address, R. WHITEHEAD, The Studio, Grays, Essex.

Several numbers of JOURNALS and News offered for chair backs (fancy).—Address, WILLIAM THORNTON, Lockwood-road, Iluddersfield.

- Will exchange 100 photographic lantern slides for quarter-plate camera complete.—Address, R. J. SHEERMAN, 147, Clarence-road, Lower Clapton.
- Dissolving view lantern for limelight, complete, in exchange for whole-plate portable camera and rapid rectilinear lens.—Address, EASON & Co., 16, Dalston-lane, N.
- I will exchange concert cocoa-wood flute, with six silver keys, also a camera lucida, for a half-plate bellows camera.—Address, A. B., 3, Chapel-terrace, Malahide, Co. Dublin.
- Offer, Meagher's best whole-plate landscape camera with three double backs, in solid leather case. Want, Dallmeyer's 2B and 3A lenses.—Address, A., 179, Lord-street, Southport.
- Wanted, an old-fashioned view lens (meniscus) of long focus; will give a good changing box for whole-plates and under.—Address, BURGOYNE, 345, Coventry-road, Birmingham.
- Will exchange eight volumes of THE BRITISH JOURNAL OF PHOTOGRAPHY (four bound in cloth) for 10 x 8 or 8½ x 6½ rectilinear or symmetrical lens.—Address, JOSEPH FOWLER, 126, Castle-street, Glasgow.
- A first-rate quarter-plate double combination lens in exchange for a whole-plate camera, square, bellows body, to expand about twenty inches, for copying, &c.—Address, MANAGER, Midland Studio, Harborne, Staffordshire.
- Lantern with three-inch condensers, achromatic front lens, with fifteen coloured Scripture slides in wood frames and six comic slipping slides in frames. Wanted, good whole-plate or cabinet-burnisher.—Address, T. L., 26, Earl-street, Coventry.
- For exchange, last seven years' JOURNAL, 12 x 10 copying camera, half-plate portrait lens, half-plate repeating-back camera, and tripod stand. Wanted, whole-plate portrait lens and camera, and 12 x 10 view lens.—Address, W. B., 32, Stoke-road, Guildford.
- Will exchange, boat, oar, and water-piece complete, for interior background; also 5 x 4 pocket camera, by Shew, with two double and one single dark slides, for quarter-plate camera with or without slides.—Address, GEORGE C. RADFORD, The Studio, Mansfield.
- Will exchange THE BRITISH JOURNAL OF PHOTOGRAPHY and *Photographic News*, without picture supplements and unbound, for the years 1884, 1885, 1886, for a good whole-plate view or instantograph lens.—Address, M. H., 31, Sarab-street, Newcastle-on-Tyne.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

- H. HATTON, 36, Leeds-road, Dewsbury.—Two photographs of R. E. Lockwood in jersey and cap.
- William Usherwood, 32, High-street, Dorking.—"Derby-place," 1886.
- Anderson & Son, Dalry, Ayrshire.—Portrait of J. Ewing in walking suit.
- Thomas H. Radford, Tower-road, Aston.—Photograph of Aston-villa Football Club.
- Thomas Thorburn, Prestwich, Ayr.—Three Portraits of the Champion Mount St. Bernard Dog, "Save."
- A. P.—Send specimen of your work.
- WILLIAM GREY.—The *Bulletin Belge* may be ordered through Triibner, Ludgate-hill, London.
- J. J. BROWN.—We are unable to say to what impurity the opaque spots on the negative are due.
- Ox.—The canvas enclosed is well adapted for breaking up the emulsion. No fault arises on that score.
- LUX (Burnley).—The largest of the portrait lenses named will be the most useful for daylight enlarging.
- CHAS. BOWDEN.—A fairly good six-inch double condenser may be obtained for £3. Either gas or oil lamp will serve for enlarging.
11. E. DAVIS.—When your shutter is complete we will be glad to see it. Any letter sent here for the author of the article will be forwarded.
- TUESDAY.—To remove the stains from the fingers, try a saturated solution of alum to which a liberal allowance of sulphuric acid has been added.
- WM. MCC.—By all means decide upon the lens of the rapid type. The portrait lens, though quicker, will not be nearly so suitable for your purpose.
- R. S.—The print appears to be a colotype of German production. These prints are produced in Germany by machine printing at a very cheap rate.
- Q. H. D. C.—It will cost you but little to send the lens here, when we will be able to examine it and correct the defect; failing which we can show it to the maker.

- GWENT.—For over exposure add to the developer a solution of bromide of potassium. See Article for Inexperienced Photographers in the issue of the 4th instant, page 74.
- L. DIXON.—To develop micro-photographs so as to bear a power of an inch it is necessary that pyrogallic acid be employed. Iron will produce a too-granular deposit.
- G. AYNLEY.—We see no reason why, under the circumstances, you should not use the picture as a specimen. Certainly the sitter cannot prevent you doing so if you choose.
- R. A. JOHNS.—The spots are due to the plates themselves, and not to anything in the manipulation. There is no remedy but to either make fresh or purchase some of the commercial plates.
- S. B.—Innumerable methods for imparting a colour to prints have been employed. We can offer no opinion as to the merits of yours until we know something concerning it, or, at any rate, see a specimen.

- J. CHESTER JARVIS.—Willesden paper will afford the protection required for the damp wall. The firm from whom you may purchase it will afford every information as to the best means of causing it to adhere.
- VACUUS CANTANS VIATOR.—The propensity of a lens to give a flare spot can be removed. See report of meeting of North London Society on another page. The address in question will eventually be published *in extenso*.
- ELEN HILL.—The reason of the failures is that the prints are very much over-toned. Fifteen grains of chloride of gold in forty-five ounces of water is far too much. One grain of gold to eight or ten ounces of water is a far better proportion, as then the action is much more regular and better under control, particularly in the hands of a novice.
- TYRO asks: "Can you tell me what fixative is used for charcoal or carbon drawings? How is it made and how applied? I have been doing some drawings and find the charcoal rubs off."—If the drawings be floated upon or immersed in skim milk the pigment will become fixed. Detailed information on the subject will be found in any of the manuals on crayon drawing.
- AMATEUR asks: "Would you kindly answer in your 'Answers to Correspondents' what is the best preparation for mounting the rim photographs on the glass? and what is the best preparation for the black used as a mask?"—There is nothing better than a dilute solution of gelatine applied in the way we have so often described. For the black portion of the mounts Bates's black varnish or Brunswick black will answer; the former dries the quicker.
- OBSERVER writes: "As I intend to erect a studio with a north-east light, and am at a loss for the proper proportions, I will feel obliged by replies in your paper to the following questions:—1. Is thirty-six by fourteen feet sufficient floor space for all purposes of family groups and general photography?—2. Is eight feet sufficient height from floor to eaves?—3. The proper pitch for roof, so as to reduce the trouble from the sun to a minimum."—1. The proportions proposed will answer quite well, though for groups, particularly if many figures have to be included, a greater width would be desirable. If the groups are only composed of three or four figures, fourteen feet will be sufficient.—2. The height will be sufficient.—3. The pitch of the roof should not be less than forty-five degrees. Galvanised iron or zinc.—The address is Willesden Paper Works, Willesden, N.W.

NOVICE sends some of his attempts at carbon printing, and asks the reason of the small spots with which the prints are studded. He says the spots are more prevalent after the tissue has been kept a few days than when it is used the day after sensitising.—The spots may arise from several causes. They may be due to insoluble particles in the tissue itself, though this is scarcely likely to be the case. We suspect that particles of some substance gets in contact with the tissue whilst in a moist condition, and so sets up an insolubility. Particles of pyrogallic acid, if floating about in the room in which the tissue was dried, would fully account for the evil; so would particles of alum, sulphate of iron, and many other substances used in the dark room. Dry particles of bichromate of potash will also cause specks of insolubility if they come in contact with the moist tissue. The remedy is obvious supposing the trouble arises from the suggested source.

REV. HENRY B. HARE.—1. "ColloTYPE" is a term created for the purpose of signifying a print obtained by a process analogous to lithography. A stout plate of glass is coated with gelatine and bichromate of potash; when dry it is printed under a negative; afterwards sponged with water, which is absorbed by the parts protected from the light, whereas those portions on which the light acts fully are hardened and resist the penetration of the water. Ink is then applied by the lithographic ink roller, and impressions obtained in the usual way. The picture of the Derby Convention in our volume for last year was printed in this manner. We shall bear in mind your suggestion concerning a detailed account of the process.—2. With regard to what you designate the "stupid and unprovoked attack" in the pages of the fatuous contemporary name], and concerning which the Council of the Camera Club speak in even stronger terms of denunciation and repudiation than those employed by you, it was looked upon by the person attacked with amusement, knowing as he does that "*Quem Jupiter vult perdere &c.*"

PHOTOGRAPHIC CLUB.—At the next meeting of this Club the discussion will be on lantern matters. This is a lantern night. Visitors are invited.

PHOTOGRAPHING A BULLET.—Dr. Riegler, of Pesth, is said to have just made a very curious experiment in photography, and one that to many people will appear almost incredible. He has photographed a bullet after it had been fired from a rifle, and while it was proceeding with a velocity of 440 metres—rather more than a quarter of a mile—a second. A Wernld infantry rifle was the weapon selected for the purpose of conducting the experiment, which was in every way successful, a perfect reproduction of the bullet being the result. A horse at full gallop, a swallow in its flight, and even a flash of lightning, have succumbed to the photographer's art; but this last triumph is still more marvellous.

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HOW TO AVOID NEGATIVE BREAKAGE.

THERE have lately been brought under our notice several cases of negatives broken from one particular cause, which, as it is of such a nature as might possibly escape observation if attention were not drawn to it, we have thought a description might be of sufficient interest to bring before our readers, as our words may serve as a warning to provide against mishaps, through similar existing but unobserved causes, with other photographers. At the same time we may take note of additional untoward circumstances of a kindred nature. Doubtless the one we refer to is no novelty to some of our readers who have the handling of large numbers of negatives, and the suggestions we have to make are probably such as have been acted upon by them.

The line of breakage in the untoward experiences we describe have all commenced at the corner of the negatives, and after one or two instances had been shown to us we suggested that the stock of unexposed dry plates should be examined to ascertain whether they were not, when received, already injured. Our suggestion led to the discovery of several plates at one or other corner of which rudimentary danger in the form of an exceedingly minute crack could be discerned upon close examination, such examination as would rarely be given under ordinary circumstances. Now it is morally certain that a negative with a minute crack at one corner is bound to give way eventually. It may survive, under favourable circumstances, the printing of many copies, or it may "go" the first time it is put into printing. We would therefore suggest that, as, in the handling of plates before packing, and of the packages themselves when being stored, occasional injury to a corner is not an exceedingly improbable occurrence, every negative taken should be most closely scrutinised before being printed from, as at that stage of the crack all evil may be prevented by the simple method of cutting off with a diamond the whole corner of the glass containing the crack. This, however, must be done most cautiously, or the crack will spread instantly, perhaps from corner to corner. After examining the injured corner by turning it in all directions, so as to discover the furthest point to which the injury extends—and we may note that it is remarkable to how great a distance it may extend without being noticed—the negative, entirely freed from any foreign matter which may adhere to it, should be placed upon a perfectly flat surface—a piece of plate glass is the best—and a diamond cut made with a firm hand across the corner. If the cut do not go across the crack itself the negative will then be perfectly safe; but in printing it will be advisable, as a precautionary measure, to use a frame with a plate glass front, so as to distribute the pressure.

But instances will occur when the split extends so far that to remove a piece of glass containing it would be detrimental to the picture required. In this case we still say it would be tempting fate to print from it, and the plan, then, is to lead the crack in the least hurtful direction. Suppose, for example, in a 12 × 10 negative the crack extended for an inch or so, and rather more towards one side of the plate than the other. A piece of iron slightly pointed (we have seen a thin poker used) should be made red hot and applied to the back of the negative, about a quarter of an inch in front of the crack, which will, in a moment or two, be seen to advance towards the heated iron. Then the iron should be removed—raised from the glass, and not drawn along—and again placed in advance of the crack, which, once more, will follow the iron. This process—one well known to the practical chemist—may be repeated until the crack is led close to the edge of the glass, and then the piece may be separated by a slight pull. At this stage the negative, though rather unsightly, is rendered free from future danger, and should be printed with glass protection as above. If the piece removed contains some portion of the subject that cannot well be spared, it should be cemented with Canada balsam to the other part and always protected by a piece of glass; the crack will then not print, but the operation calls for skilful handling.

Another fruitful source of breakage lies in the thinness of the glass which some makers use for the larger sized plates, with the object, we presume, of avoiding excessive weight. We have seen the danger of this in two different directions. When removing a large plate from the developing tray during the progress of development, a certain amount of "pull" is usually needed either through so-called suction, or adhesion from the gelatine at the back, that so largely distinguishes some brands of plates; but in some makes of trays the sides are irregular enough to slightly imprison the plate, and the "pull," instead of being from the accustomed cause, may arise from the plate being so caught. Hence, with a thin plate a crack is almost inevitable, and is so easily brought about that the actual cause escapes attention, and it is assumed that the crack was there at first, and had spread during the handling. We may say we have been a victim ourselves to this form of accident, though it is quite possible that one of the unnoticed fine cracks above alluded to may have existed, so as to give a start to the breakage.

We have also seen thin negatives broken while being removed from grooved zinc washing troughs, through placing a little transverse pressure upon the glasses, instead of carefully removing them in a perfectly upright direction.

One of the commonest causes of breakages is inequality of pressure in the printing frame, and this may arise in many

ways, the commonest being unevenness of the bed upon which the negative lies. This unevenness may arise through the frame not being true, or through small particles—a minute particle of glass or a splinter of wood from the frame itself—resting on the *rabête*. Such particle of foreign matter may often be present without injury, but if an unusual pressure or a sudden jar be given, the glass is not sufficiently elastic to withstand it, and then, when the print is removed, the negative is found to be broken. An examination will generally reveal the presence of some minute elevation at one end of the line of severance, and it is remarkable how very slight an elevation suffices to produce a rupture of continuity in the substance of the glass. We have seen a circular piece of glass cut out of one plate in a packet, from the uneven pressure of a fine curled-up blade of hay grass accidentally included between two of the plates.

When negatives are wrapped together the emulsion so often found at the backs of plates is a dangerous provocative of breakage. The elasticity of glass is very slight at the best; when it is diminished by cold, or other causes, it may be unable to respond to the slightest irregularity of stress, and it gives way at the point of greatest tension, especially when the irregularity is suddenly produced as by jarring or slight concussion.

In general terms, therefore, we would say that to reduce breakages of negatives to a minimum, let the corners of negatives be uniformly closely scrutinised before placing them in the printing frame, and in handling and storing let the utmost care be observed to avoid the slightest irregularity of pressure.

ORTHOCHROMATIC PHOTOGRAPHY.

It will be remembered that during the past few years we have on many occasions directed attention to the excellence of the reproductions of works of art by Continental photographers, and have urged English artists to give attention to orthochromatic photography, to which the superiority of the foreign work was said to be due. However, since the last Exhibition of the Photographic Society, when Messrs. Dixon & Son showed the results they had achieved in this direction, there has been no lack of interest in the matter. As our readers are aware, it has formed an important topic for discussion at nearly all the metropolitan societies.

At one of the recent meetings of the London and Provincial Photographic Association, Mr. J. B. B. Wellington read a very valuable paper on the subject, and at the Conference of the Camera Club a fortnight ago two important papers were also contributed, the first by Mr. W. H. Hyslop and the second by Captain Abney (not published), both of whom have given considerable attention to the matter. The former gentleman's paper was of a thoroughly practical character, while that by the latter was more particularly devoted to the theoretical part of the question.

Mr. Hyslop, like Messrs. Wellington, Bedford, and many others who have tried it, find that eosine, whatever may be its properties when used with collodion, quite fails to produce the desired effect when used with gelatine. The same may be said with reference to chlorophyl and several other substances which have from time to time been mentioned in connection with collodion. Mr. Hyslop's best effects were obtained by the employment of erythrosine in conjunction with ammoniochloride of silver, or with citrate of silver, and between the

two there appears to be but little to choose. Mr. Wellington secured his best results with erythrosine and carbonate of silver. The difference between eosine and erythrosine, it may once more be explained, is that the one is a tetrabromfluorescein and the other a tetraiodfluorescein. Some of the results shown at the Conference were quite equal to, and in some respects it was claimed for them that they were better than, those on the commercial plates, the superiority being in the rendering of the reds.

In every case where the best orthochromatic effect was obtained, whatever the chemical agents employed, it was in conjunction with the yellow screen on the lens. Captain Abney, in his experiments, instead of the yellow glass, used a yellow reflector, which he exhibited at the meeting. This is a concave reflector, similar to those used when the electric light is utilised for portraiture, except that it is coloured yellow instead of white on the inside, so that the object to be copied can be illuminated by a yellow light. By this means the same end is attained as by using a yellow glass on the lens. One very important point, alluded to by Mr. Hyslop, in connection with orthochromatic photography should not be overlooked by experimentalists, namely, the value of the reds.

In many of the examples shown at the Conference, the reds, particularly on the commercial plates, were not nearly so well rendered as they were on the ordinary plates. In some instances they came out almost if not quite black, and this appears to be a very general experience with commercial orthochromatic plates. The reds in a painting are of quite as much importance as the yellows or the blues. If they be ignored or come out black in the photograph, it is manifest that whatever advantage is gained in the blues and yellows is at the expense of the reds, as these, it appears, at present are more correctly rendered by ordinary than by orthochromatic plates. Here is a field for further experiment.

In investigating this part of the subject, experimentalists should deal with all colours, and not confine themselves, as some appear to have done of late, simply to blues and yellows. A colour chart, similar to that shown at the Conference by Mr. Hyslop, which we have since had in our possession, appears to be well suited for experimental purposes, and is a most crucial test for any plates, and excellent for comparison. It is constructed as follows:—Strips of coloured paper—two or three shades of each, as well as white and black—about three inches or so wide, are pasted on a large sheet of cardboard; then some narrow strips of the same paper are mounted at right angles across them. By this means a chart is obtained in which each colour or shade is brought into juxtaposition with every other colour or shade. Hence the orthochromatic effect on the negative can be judged of with the greatest nicety, and this cannot be correctly done unless the different test colours are actually brought into contact.

In connection with the subject of orthochromatic photography is an important point for the consideration of photographers namely, how the different colours really should be translated into monochrome. For example, how should the blues, greens, reds, yellows, &c., of a painting be rendered in a photograph so as to convey a correct impression of the original? To make a medium red or blue nearly or quite black, or an orange almost white, is clearly incorrect. It is generally considered that the various colours should be translated according to their luminosity. But this is not always done by engravers, as a comparison of some engravings with the original paintings will prove. Evidently engravers and artists themselves are not all in accord

on this point, as will often be seen where two plates from the same original have been engraved by different men.

Although photographic plates may now be prepared so that they render colours widely different from what the ordinary ones do, still it is important to bear in mind that they should do it with some approximation to correctness if possible, and not one colour at the expense of another.

Since writing the foregoing, and *apropos* of the subject of orthochromatic photography generally, we have just received the specification of Dr. Vogel's new orthochromatic patent, which will be found on another page. Time at present only permits of our thus briefly referring to it.

DRYING AND MOUNTING GELATINO-CHLORIDE PRINTS.

WHILE writing further upon this subject, it may be remarked here that a great deal of the comfort of stripping depends upon the proper hardening of the surface of the print in the alum bath. If this is not properly done there is frequently great trouble, especially when glass is used, from portions of the surface sticking firmly to the glass. With a properly hardened film, however, there is rarely any trouble of this sort, but if it be desired to make assurance doubly sure, the print may be allowed to dry after hardening, and be again wetted previous to its attachment to glass or other support.

After squeegeeing on to the support, the print must be allowed to dry spontaneously. On no account must heat be resorted to, or portions of the picture will come away from the support whilst the remainder will be permanently fixed. Nor is it advisable to hasten the drying by other means, such as placing the print in a current of air, as this creates a tendency on the part of the portions first dry to leave the support, and so give the print an uneven and "crinkled" character. When perfectly dry, if all has gone on well, the print will leave its support with the greatest ease if a corner be raised with the point of a penknife, and will be perfectly flat and possess a surface glaze dependent upon the material upon which it has been dried.

The surface thus produced will be lowered to a considerable extent in the operation of mounting, though not to the same degree as in the case of a silver or carbon print stripped from collodionised glass. The surface remaining after mounting a gelatino-chloride print much resembles that of an unrolled albumen print, and may be treated in the same manner as the latter if proper precautions be adopted to ensure that the surface is *perfectly dry*, as well as properly lubricated before either rolling or burnishing. The one great point is perfect dryness, and this condition does away with the possibility of employing any liquid lubricant such as alcoholic solution of soap; for the small proportion of water contained in the liquid, as well as some of the alcohol itself, cling so tenaciously to the gelatine surface, that it is next to impossible to drive them off, and the consequence is, on passing the print through the burnisher, that the film sticks, and is abraded or otherwise injured. Powdered talc rubbed well over the dried surface acts as a good lubricant, or, better still, a mixture of talc and finely powdered and perfectly dry Castile soap applied in the same manner. A little of the powder is dusted on to the print and rubbed *gently* until well distributed, after which greater pressure is applied until the soap imparts a slight gloss to the surface. It should then be passed through the

burnisher with as little delay as possible, otherwise the thin film of soap will absorb moisture from the atmosphere, and render the attempt abortive.

In those cases where it is desired to retain the full "enamel" gloss, it will be necessary to proceed in the same manner as in mounting enamelled silver prints, or double transfer carbon prints from glass, namely, the mount must be attached to the print before the latter leaves its temporary support, and mount and print be dried and stripped at the same time. This, of course, is a more troublesome operation, and one that requires some skill in its performance.

A more simple plan, which we have worked experimentally, seems well suited to amateur work, though even in this it must not be expected that success will result unless the utmost care be observed throughout. The method is as follows:—Procure some of the thinnest sheet ebonite obtainable. The Silvertown Indiarubber Company, of Cannon-street, supply a suitable article, which is what we have used; it is about the thickness of a stout visiting card, perfectly flexible, and thin enough to transmit a moderately strong light. Cut this into pieces the exact size of the prints to be mounted, that is to say, the size they are to be when attached to the card. Prepare these sheets in the ordinary manner with powdered talc, and squeegee on to them the *untrimmed* prints in the ordinary manner. When half dry, or when they have been some time in contact with the support, let the prints be carefully trimmed with the scissors to the size of the support, taking care that the edges are cut clean. If allowed to become dry, the projecting margins of the print will by their curling detach the print from its support; but as there is no necessity for drying before mounting, the edges may be removed as soon as the print has become well attached to its support.

Having trimmed the print as it lies on its support and before it has become dry, apply to its back any good mountant. The best for the purpose is a warm solution of gelatine with a considerable quantity of alcohol added. Apply this evenly to the print, and then place it, support and all, in position on the card mount, rub down in the ordinary manner, place under pressure or pass through a rolling press. Or Mr. Alexander Cowan's method of mounting is well adapted to this process, in which arrowroot or other mountant is applied to the mount and allowed to dry, when the damp print being placed in position, the whole is passed through a rolling press, the moisture of the print sufficing to ensure instant attachment.

Whichever method is adopted, print and mount must be allowed to become perfectly dry. This may occupy some time, since the moisture must be absorbed into and escape by the mount. For this reason Cowan's method is preferable in consequence of the small quantity of moisture it involves. When perfectly dry, the ebonite support is easily removed by carefully raising one corner, and steadily but firmly peeling it away from the picture. In order to facilitate matters, and to prevent the mountant getting in between the print and its support, it is well to give the latter an edging of vaseline or paraffine to the depth of an eighth of an inch in addition to and after its preparation with talc.

If the high gloss be objectionable, there is no necessity for any of the trouble of drying upon glass or other support. The print after hardening and washing is squeegeed upon glass, as previously described, merely to expel superfluous water and hasten its drying. It is, however, immediately stripped from the glass and hung up to dry in the ordinary way. The curling in drying will be much less than in the

case of albumen paper, and it will when dry be found easier to manipulate than the latter. From this point the treatment of the gelatine paper is identical with that of albumen, only observing the precautions already mentioned with regard to lubricating and burnishing.

FROM the report of the Annual Meeting of the Photographers' Benevolent Association, which will be found in another page, it will be seen that the door of this Association has been thrown wider open. One of the laws which confined its operations to professional photographers has been altered to embrace all who are *connected* with photography. This is a judicious alteration. It is also noteworthy that the Rev. Mr. Tooth, a philanthropist who holds the keys of a Home for Boys in London, where they are educated and lodged, has most kindly offered to receive one such boy recommended by the Association. We are glad to find that the "Benevolents" have received a large accession to their list of members, and that they are financially in a flourishing condition, although, with a still further increase of funds, their powers for good will be largely augmented.

Most photographers are familiar with the admirable series of portraits by M. Nadar, of Paris, which have been lately shown at the meetings of most of the leading photographic societies of England. They are prints from ordinary negatives on gelatino-bromide paper with a coarse surface, such as that of drawing-paper, and of a fine black tone. The special feature about them to which we wish to direct attention, is the style and treatment in the finishing, which no doubt will become popular. The prints are produced with a pure white margin by masking the negative, so that mounting on cardboard is rendered unnecessary. The prints themselves being merely plate marked are then ready for framing in the same style as an engraving. When so finished they somewhat closely resemble good mezzotint prints. Photographs of a rich black tone—whether they be gelatino-bromide, carbon, or platinotype—finished off in this way have a much more refined appearance, and are far more in accordance with the present improved artistic taste of the public, than when they are mounted in the orthodox cut-out mount with its tawdry gilt level.

MASKING negatives at the edges, so that they can be printed with a clean margin, is a very easy matter. One method is to paint neatly round the edge of the negative with black varnish, and then on the reverse side to gum strips of black or non-actinic paper somewhat wider than the margin required. Another plan is to cement broad strips of paper direct upon the face of the negative. The latter is the simpler method, but it has the disadvantage that, unless the paper be very thin, a sharp and well-defined outline, which enhances the beauty of the picture, is not always obtained. Also the occasional expansion and contraction of the paper itself, or its becoming accidentally detached from the glass, is liable to give rise to inconvenience.

THE plate marking of prints, whether mounted or unmounted, which adds so much to their artistic effect, is by no means a difficult operation to any one possessing a rolling press. The best plan, undoubtedly, is to roll the print on a plain polished steel plate with bevelled edges, such as those prepared for engravers. The rolling and plate marking is then accomplished at a single operation. This, however, is seldom done in practice, as a set of steel plates for all the different sizes required would be somewhat costly, besides requiring considerable care to maintain their pristine polish. The plan usually followed is to roll the prints first on the usual bed of the press, and then roll them again with a lighter pressure in contact with a sheet of zinc about the thickness of a stout card, the edges of which have been slightly bevelled. In order to give the plate mark, two or three thicknesses of blanketing, or soft felt, must be interposed between the roller and the print. In place of the zinc, cardboard is often utilised. When this is done it is obvious that the pressure applied must be light, otherwise the surface obtained by the first rolling will be destroyed and that of the cardboard substituted.

It does sound somewhat strange, now that photographers are supplied with their plates ready for exposure and development, to hear that first-class operators are difficult to obtain. Such, however, we are assured by several leading photographers is the fact, and that good operators are as scarce as formerly. In the old collodion days, when a certain, though very limited, chemical knowledge was essential in order to prepare and maintain the different materials in the best working condition, such a difficulty could readily be understood, but now the thing seems incomprehensible.

THE detective department of the police has been the subject of much comment of late with reference to the non-arrest of Currell, of London, although he was never half a dozen miles away from the place where the murder of which he is accused was committed. The defence of the police is that the portrait issued for their guidance was so bad that it was perfectly unrecognisable. There is, no doubt, good ground for this assertion, as every one must admit who saw the wretched prints which were exhibited in every direction. Bad as the block must have been in the first instance, the impressions were rendered much worse than they need have been in the printing, and by the exceedingly common paper employed. It is rumoured that the trouble this matter has caused will bring about an entire rearrangement of the police portraiture. Phototypic blocks of excellent quality can now be obtained at a short notice, and at a moderate price, but they must be somewhat carefully printed and also on a moderately good paper.

SEEING that it occupies some time to prepare a surface block for effecting due publication by the police or others for persons wanted, it is well to realise the fact that faithful silver prints may now be taken from a single negative at the rate of a thousand per day, the quality being all that the most fastidious can desire. We refer, of course, to that system of printing on Alpha paper by Urie's Automatic Printing Machine, and by which our ALMANAC is this year so admirably illustrated. But the doctrine of evolution appears to be active even as regards this machine, for when we received a visit from Mr. Urie, a few days ago, he informed us that, in consequence of still further improvements he had made, he was able to announce that the large number just mentioned might now be increased to twelve thousand prints per day. But in the case of the larger output the tones will be somewhat darker than in that of the lesser number, for in order to obtain warm, light tones, a longer exposure is necessary.

INQUIRY is frequently made as to the best proportions of gelatine, water, and alcohol, to form a medium for mounting photographs without their cockling. It is advisable to use as much spirit as possible, but the proportion that can be introduced, without causing a permanent precipitate, depends upon the strength of the solution and the character of the gelatine itself. The weaker the solution, whatever be its character, the greater the proportion of alcohol that may be employed. If the gelatine be of a strong and tough kind, such as that used for emulsions, far less spirit can be added than is the case with one of a friable quality, like those employed for thickening soups, or of the common glue type, that is, supposing the solutions be of equal strength. For mounting purposes the latter variety of gelatine is far preferable to the former, as more alcohol can be used; added to this the solution does not curdle or gelatinise so quickly, consequently it is more convenient to use. When a solution of gelatine begins to gelatinise before the two surfaces to be attached are brought together, much of its adhesive properties are sacrificed. It is for this reason, when making the strongest glue joints, that the solution is always made thin and is applied as hot as possible. With attenuated solutions alcohol may be added to almost any extent without causing precipitation.

METHODS OF RETOUCHING.

II.

A METHOD which finds considerable favour with many English retouchers of experience, consists of filling in or spotting all the leading imperfections and general defects almost completely; that to say, the pencil is worked carefully over all the transparent spots

specks, lines and other markings, until no trace of them is visible. This done, the inequalities of light and shade, also the modelling of the various features and muscles of the face, are harmonised by a system of straight, or very nearly straight, lines, running in a downward direction. In this treatment the lines must necessarily run across the muscles and lines of the face. Although, as I said, many really good retouchers adopt this method, and some undoubtedly good results are gained by it, I do not at all think it an advisable one to adopt as a model on which to form a special style or method for oneself.

As the reader will observe, there are some points, though few, in this method which may be considered slightly analogous to the method described in the preceding chapter. It will be easy, on examination, to see how very slight, however, is this resemblance when I say it is only to be found in the treatment of the nose and the frontal depression.

In this method, although the lines all take a downward direction, they are very seldom *parallel*, or, to be more correct, perhaps I should say, equidistant. Now, this must necessarily detract from the firmness of touch as well as the general quality of the work when finished. Some retouchers, who are more than ordinarily skilful in this method of working, however, make lines so very fine, that they will, under some circumstances, impart the appearance of having been *dotted*. Indeed, when extremely successful, and on a negative which lends itself to this method of working, a result will be produced which might easily pass as having been accomplished by a system of *stippling*. This occurs but seldom, as few negatives will offer favourable opportunities for success. Besides, the effect will be by no means so good as that produced by the bolder and more artistic treatment of the *lines*, and need not, therefore, demand our further attention.

It will be found advantageous to reflect well on all the various methods of working—good, bad, and indifferent—while endeavouring to form one for one's own special use; but care must be taken not to model it upon any system but the best. The knowledge of an inferior method need not make a student fall into the errors of its ways, but rather serve as a warning to keep away from them. It may seem strange that I should lay down the theory that a really good and well defined method should not be adopted by the student and, in fact, become the general treatment for all retouchers. This, however, will be easily understood when I say that *sentiment* (if I may be allowed the expression) is such a necessity to the producing of successful work. It is this very *feeling* or *sentiment* in the retoucher's art that makes it absolutely necessary for each artist to adopt his own particular method, that *system* which will produce in *his* mind the most harmonious and graceful results. There is, relatively, as much sentiment and appreciation in a retoucher's treatment of a head, on a negative, as there is in an artist's colouring of a picture. All artists will not sketch in and colour a portrait according to hard-and-fast lines, but be guided by their *feelings* as to the treatment of their subject. It is this same *feeling* that must guide the retoucher, although in a lesser degree, and in a much humbler work of art.

It is the possession of these artistic feelings that will show to advantage, as a retoucher perfects his style of work, and according to the degree they are possessed so will the excellence of his works be valued. It is *feeling* alone that will preserve *intellect* in a head, while *taste* may prove sufficient to produce a passable work. It is needless to say which would take the palm in the scale of excellence.

In America all the various methods and styles seem to have their fair share of supporters. As a rule, however, the leading retouchers work rather more in a scumbling style, being bound by no rules as to the making of a stroke. Wherever taste suggests or an imperfection requires it there he places his touch. This is very naturally a very convenient manner of working, and when thoroughly experienced can be carried to a very high degree of perfection. But, mark you, one must be truly proficient to succeed in it. Of course in this treatment no particular attention is paid to the direction of the lines of the skin or muscles; at the same time the work will be found to take a more systematic form than what we may describe as scumbling. The nearest I can get to a description of the touch is by calling it a saw-tooth one. If examined with a powerful magnifying glass the shape or character of the markings will be found to closely resemble the "business side" of a saw. The touches are generally made very fine, and produce a very charming effect of stipple when printed. The student can easily see what I mean by carefully examining a few of the American portraits sent over to this country. Sarony and Mora, of New York, have sent us very many beautiful examples of retouching, and are well worthy of the attention of the intending retoucher.

On the Continent of Europe there are many most excellent systems

of retouching. Indeed, generally speaking, they are nearer the perfection of this art than they are either in this country or in America. Although widely different methods may be used in the same town, or even the same studio, by various operators, all seem to get the desired artistic effect to a uniform degree of perfection. I can only account for this by the fact that almost every retoucher on the Continent has had a more or less sound art education. To this they add their natural artistic *feelings* which instinctively guide them all to that point of excellence that the less cultured or commercial retoucher can never hope to arrive. On the Continent excellence is the object one places before them, reasonable time being allowed for the production of first-class work; here I regret to say such is not the case. Here it is a question as regards the result, "Does it pay?" There the sole trouble is, "Is it good and artistic?" This will easily account for the difference between the work produced here and abroad. There are men here daily producing *ordinary* work that, if placed on the same footing as their Continental *confrères*, would be found capable of producing results second to none. Here we are commercial or nothing. In many cases it is a question more of "How many heads has he done to-day?" than "What splendid work this man is producing!" By this I do not wish to infer that we cannot hold our own, or that all we do is wrong and everything done on the Continent is perfection. On the contrary, for we will find on examination that large numbers of Continental negatives are manifestly much overworked and the likeness almost, if not absolutely altogether, taken away. But even these, as a rule, please the ignorant public (I hope they will forgive me), and so the majority of the photographers continue their production. I most sincerely wish the public would be less easily gulled by injudicious flattery, as much better works would be the result in thousands of cases where really bad ones now pass muster.

It seems a rather disputed point as to whom the honour of introducing the art of retouching into this country should be awarded. I believe Herr Mohr, of Frankfort-on-the-Maine, however, may fairly be allowed to take the credit. He certainly took the monetary blessings attached to it, if that should prove anything. It is undoubted that a few worked it secretly before his advent, and a very good thing they made of it. Those who thus practised it guarded their secret as a miser would his gold. They kept it from the rest of the profession, who, in their blissful ignorance, wondered at the excellent results produced by their more fortunate, I won't say more enlightened, rivals.

If I mistake not, Mr. Williams, of Regent-street, in those days caused not a little sensation by the marvellous results he then produced. For the first time ladies with badly freckled faces got a presentable portrait. The result was all flocked to his studio to be taken. How time changes all things! The best works turned out by Mr. Williams in those days would stand but a poor chance to-day beside the works of any of our leading firms.

In those days the now old-fashioned plates were in general use, and, of course, were not retouched under the same conditions as the negatives of to-day. Then we had to retouch on the collodion film, either before or after varnishing. In the case under notice colour played as active a part as the pencil. The latter being the better agent has naturally completely distanced its rival. I believe Mr. Williams used colour first, and ultimately used the pencil as well in retouching his negatives. However, he began with using a neutral colour and sometimes a blue to make up the necessary density to do away with the defects in his negatives and so produce those results which brought him in vogue. As I am on this subject I may as well say a few words upon the system of retouching upon the old collodion plates which came into general use shortly after Herr Mohr began to teach it publicly.

The film of the old wet plate, unlike that of its tough, dry successor, was delicate, and would not bear the touch of a pencil. I will not dwell upon its treatment with colour. To impart to the film a necessary power of resistance, and also a tooth to take the plumbago of the pencil, a medium had to be employed. The most common method was to dip each plate in a weak solution of gum, which, when dry, would not only impart a firmness to the film but also a tooth which would greatly facilitate our work. Great care had to be taken not to breathe on the film, as so doing would soften it, and the pencil touching it would cut through. Assuming that the plate is all right for working, we had to treat the negative as laid down for the dry plates, but could not work, of course, with the same boldness or firmness of touch. The pencils used were generally soft, and the touch light. Indeed, the tooth on these old-fashioned negatives gave touch as freely as would drawing-paper. Sometimes, if the least moisture happened to have been absorbed by the film, the negative would come to grief in the varnishing. Indeed, this fact gave rise to the

habit in this country of generally working *after* varnishing, instead of before. In Paris I never saw a negative retouched *after* varnishing, but here I have had to retouch more than nine out of ten on the varnished film. We used to get a fine surface for working upon on the varnish by the application of a medium made up of eighty grains of gum, dissolved in one ounce of benzole. When thoroughly dissolved and filtered, this solution had to be applied to the part needing treatment with a piece of cotton-wool. It dried quickly, and by rubbing it gently with the ball of the finger a perfect surface for working on was procured. If the work did not prove satisfactory, it could be removed by the application of a little benzole, and the work begun over again. Another medium, to be used similarly, was spirits of turpentine, three ounces, and cuttle-fish, one ounce. Another—turpentine, one ounce; gum dammar, ten grains; and Canada balsam, five grains. Another was made by dissolving ten grains of clear resin in one ounce of benzole: allow to settle for a day or two before using. I worked without any medium for years, however, on Hubbard's varnish, with the greatest ease and success. It is not necessary, however, to worry much over these matters, as they belong to the long past. Still they all have an interest to an intending retoucher.

REDMOND BARRETT.

PHOTOGRAPHIC PORTRAITURE.*

ALLOW me to say a few words as to the treatment of the different features of the face.

When the forehead is high and broad, no particular attention need be paid to the view taken of it, but should it recede too much, and a side or three-quarter view of the face be wanted, let the outline blend with the background. The same treatment should be resorted to where there is an undue fulness of the upper part—of course in children this is common, and is no defect, but when occurring in the adult is better to be modified.

Very often one brow droops a little, or the eyelid may have the same tendency, in which case I find the best plan to avoid exaggerating this inequality is to turn the figure to that side and the head towards the camera, keeping the droop in the shadow. Variety in noses is endless; make the lens look down at the short, and up at the long, or rather place them in these relations to the lens. If the outline be ungraceful, modify it by more front view. A really good or beautiful nose will be valued by its possessor, and its beauty will be best exhibited by a slight turn of the head; a broad nose is improved by the same treatment and a somewhat sharp light.

The full eye, when light, is difficult to manage, and, if all other conditions are suitable, should be turned away from the light; in fact the greater portion of the face should be in shadow. When the eye, on the contrary, is dark, avoid reflections which show with marked effect on the eyeball. A sunken eye is generally turned towards the light, but I prefer it turned away, and the light diffused with a medium, such as tissue-paper, close to the head.

With reference to the mouth, the chief want felt in photographs is lightness and transparency of shadow, caused by the non-actinic colour of the lips, as where they are brightest, and therefore most beautiful, the photograph gives the reverse effect. A good deal can be done on the negative to rectify this.

No man will succeed to any great extent as a portraitist who does not exercise a constant and intelligent observation on all that affects his sitters. Details that to a careless or unobservant mind might seem too insignificant to pay any attention to, may yet be of the greatest importance. The things which go to make a pleasing portrait in any one instance may be in themselves little matters enough: the turn of the head, one inch this way or that, the raising or lowering of the eyes ever so little, nothing in fact is too small to notice. Let the eye of the operator acquire the habit of taking in his whole sitter. How different is the expression of a lady or gentleman when at their own table, or in the midst of friends on any social occasion. How vastly different from what we see them when about to take the cap off the lens. An active consciousness enters in and deprives the picture of natural grace and beauty, as well as freedom of expression; the hands very often suffer, losing entirely their natural disposition. When you are thoroughly acquainted with your subject you cannot be deceived by this conscious expression, and you can remind your sitters that they are not looking like themselves. Now, how can this be said or done when ten minutes previously you did not know such a face was in existence? This is the only reason I can give for so many random and missing shots in photographic portraiture. Knowledge of the subject I say is more or less a necessity when the highest results are aimed at. But you may say, How is this knowledge to be obtained? Are photographers to spend a week or a fortnight at their

* Concluded from page 105.

clients' houses previous to photographing them? Such is impracticable, and certainly in the case of small-sized photographs, photographer and sitters in the majority of instances must be strangers, but my remarks point more to larger photographs direct from life. I consider it risky, I don't say impossible, because it depends on the subject, to take a large direct picture of a person ushered into your presence and out again in the space of twenty minutes. On a first visit a *carte* might be taken, and on a second visit a cabinet, then the large one when you have gained the necessary acquaintance with your sitter's expression. It is a wonderful art, and because it is so greater wonders are expected to come out of it. The stream of its rapid advance is not confined to one channel, but it continually overflows and seeks with eager haste to fields and pastures new.

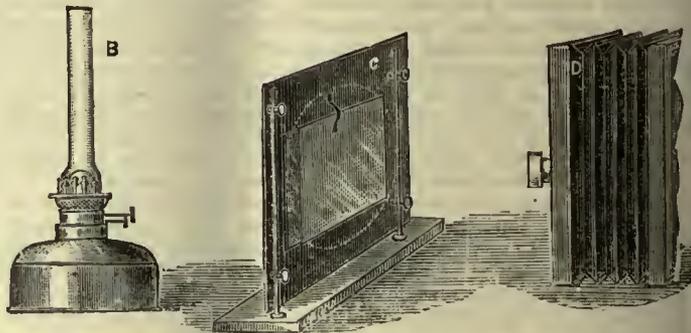
WILLIAM CROOKE.

ON PRINTING LANTERN PICTURES BY ARTIFICIAL LIGHT ON BROMIDE PLATES FROM NEGATIVES OF VARIOUS SIZES.

[A Communication to the Birmingham Photographic Society.]

THERE can be no question that there is no plan that is so simple for producing transparencies as contact printing, but in this, as in other photographic matters, one method of work will not answer all needs. Reproduction in the camera, using daylight to illuminate the negative, enables the operator to reduce or enlarge in every direction; but the lantern is a winter instrument, and comes in for demand and use during the short days, when even the professional photographer has not enough light to get through his orders. How can the amateur get the needed daylight if photography be only the pursuit in spare time? Besides, there are days in our large towns when what daylight there is is so yellow from smoke or fog as to have little actinic power. These considerations and needs have led me to experiment and test what can be done with artificial light, and I think I have made the way clear for actual work without further experiment. I have not been able by any arrangement of reflected light to get power enough to print negatives of the ordinary density, and have only succeeded by causing the light to be equally dispersed over the negative by a lens, as used in the optical lantern, but the arrangements required are somewhat different to that of the enlarging lantern.

The following is the plan by which I have succeeded best in the production of transparencies.



B is a lamp with a circular wick, which burns petroleum and gives a good body of light. C is a frame for holding the negative, on the opposite side of which is a double convex lens facing the light. D is the camera and lens. All these must be placed in a line, so that the best part of the light, the centre of the condenser, and the lens, are of equal height.

The method of working is as follows: The lamp B is placed at such a distance from the condenser that the rays come to a focus and enter the lens, the negative is then placed in the frame, the focus obtained, and the size of reduction adjusted by moving the camera nearer or further from the condenser and negative. In doing this no attention need be paid to the light properly covering the field, as that cannot be adjusted while the negative is in its place. When the size and focus are obtained, remove the negative, and carefully move the lamp till it illuminates the ground-glass equally all over, by a disc of light free from colour. The negative can then be replaced, and no further adjustment will be needed for any further reproduction of the same size. There is one point that requires attention. The lens used in the camera should be a doublet of about six inch focus (in reproducing $8\frac{1}{2} \times 6\frac{1}{2}$ or smaller sizes), and the stop used must not be a very small one, not less than a half-inch diameter; if a smaller stop is used, an even disc of light is not obtained, but ample definition is obtainable with the sized stop mentioned.

In the arrangement described, a single lens is used for the condenser, not because it is better than a double one as is general for such purposes, but because it is quite sufficient for the purpose. Of course a large condenser is both expensive and cumbersome; there is, therefore, no advantage in using a combination if a single lens will answer.

In reproducing lantern pictures from half-plate negatives, the time required on my lantern plates is from two to four minutes, using six inch condenser. For $\frac{1}{4}$ negative, from two to six minutes with a nine inch condenser. In working in this way, it is easy to be developing one picture while exposing another. The condenser must be of such a size that it will cover the plate from corner to corner. The best part of an $8\frac{1}{2} \times 6\frac{1}{2}$ negative will be covered by a nine inch condenser, and a $6\frac{1}{2} \times 4\frac{1}{2}$ by a six inch condenser.

With this arrangement it will be easy to reproduce from half or $\frac{1}{4}$ negatives or any intermediate sizes quite independent of daylight.

A. PUMPHREY.

COLLODIO-CHLORIDE PRINTING.

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

In demonstrating this process to you I claim no special merit, but wish to bear testimony to the simplicity of the operations of coating the paper with the emulsion, toning, fixing, and washing the positives, and the beauty of the results attained, as well as increased permanency over albumen prints, as far as my own small experience and few experiments will permit. I wish to raise an exhaustive discussion on its merits, as I am persuaded that sufficient justice has not been done in the case. I believe, moreover, that the working conditions of the process have been altered of late in such a manner as to fully entitle it to the greatest consideration. I shall endeavour to answer the following questions:—1. Is it a process of greater permanency than that in general use? 2. Will it be possible to achieve artistic and pleasing results without expenditure of exceptional skill and great additional labour? 3. The question that possibly may be raised with regard to outlay. This is not a momentous one if it is found possible to answer the first two satisfactory.

Before I go into the question in detail, I must submit that the process, as brought before our notice some years back, was not such as to recommend itself readily to the practical worker. Troubles arose from the peeling of the delicate collodion film, curling of the prints in their moist state, and various other complications, including uncertainties in the toning operations, which made it justly appear a difficult process; but now, thanks to Dr. Liesegang, none of these troubles and uncertainties remain. That it is a very fine process facts show. I employ the process now in the case of customers who do not mind paying a little extra and can appreciate it.

Now with regard to the first question, permanency, I would suggest that if we subjected prints to such a severe test as they are never likely to receive—namely, exposing them in a show-case facing the sun outside of the house during one summer and a succeeding severe winter, and then nail them to a wall of a room where several gas burners are for a few months, and they stood this test, we may venture to call them very much more permanent than albumen prints. I have done this with the favourable result mentioned. Numerous eminent and respectable German firms will testify the same fact, I believe, and Captain Abney says: "In the year 1869 I printed all my negatives by the process. The prints had a beautiful black-brown tone, and some have been exposed to sun and gaslight ever since that period; others are mounted in a scrap-book; and others are loose in a portfolio. Out of the lot not one has altered in colour or purity of the whites. This is what I should have expected theoretically, for there is nothing to cause fading. The organic salt of silver, which has been altered by the light, is not a complex body, but one of definite composition, since it was the citrate of silver which was employed. On fixing the part not reduced, it dissolved out freely, and there is nothing to hold it back in the film, since it consists of collodion, which is essentially porous." The Court photographer, W. Cronenberg, has used nothing else for one and a half years. He says that he has a large quantity of the best albumenised paper left for which he has no use. Of course there are emulsions sold at such low figures as are inconsistent with the good article. It is owing to this fact that many photographers try the process and reject it as not superior to others. Some fail in consequence of their own wisdom, getting hold of or accepting any published formulae from unknown writers, perhaps not even following the instructions closely.

From these and other instances, as well as my own experiments, I venture to maintain that members subjecting well-manipulated collodio-chloride prints, from Dr. Liesegang's or other good emulsions, to before-mentioned tests, they will not detect the slightest

change. Furthermore, to prove that they are much more permanent than albumen prints, I shall immerse the two simultaneously in a solution of cyanide of potassium, not with a view to demonstrate that this solvent has no action, but solely to show that when the albumen print is entirely destroyed the collodio-chloride print is scarcely attacked. From the foregoing I do not think it unreasonable to conclude that the question has been answered satisfactorily.

We will now practically examine the second question, whether we shall be able to obtain artistic and pleasing results without employment of exceptional skill and additional labour. I here submit a number of prints in order that you may examine the depth to which they must be exposed in the printing frame. The time required scarcely equals and certainly does not exceed that of the albumen process. A not very unimportant advantage over albumen prints is the fact that collodio-chloride-paper prints do not expand, and you will note in the demonstration to follow that the great obstacle, curling of the prints in the water, has been entirely removed. With reference to softness and delicacy of the prints, I may mention that by varying the proportions of the chloride employed it is possible and advisable to modify the character of the print, and I believe that Dr. Liesegang supplies separate solutions for the purpose.

Since writing the above, I am very glad to subjoin that having prevailed upon Dr. Liesegang, that gentleman has been kind enough to give me the formula he employs for making the emulsions. It is as follows:—Dissolve 8 grammes (4 drachms 3 grains) nitrate of silver in 5 c.c. (1 drachm 25 minims) hot distilled water; pour this into 200 c.c. (7 ounces 18 minims) alcohol .805; add 12 grammes (3 drachms 3 grains) pyroxyline. After the lapse of half an hour pour to it 250 c.c. (8 ounces 6 drachms 23 minims) ether; shake well. In another bottle dissolve 1 gramme ($15\frac{1}{16}$ grains) chloride of lithium and 1 gramme ($15\frac{1}{16}$ grains) tartaric acid in 50 c.c. (1 ounce 6 drachms 5 minims) alcohol. This second solution is poured into the first, agitating the combination well. For vigorous negatives take a little more chloride, as a softer print results from it.

I have made an emulsion by this formula last night in the space of ten minutes, not counting a half hour's interval, and coated a sheet of paper, and obtained some very excellent prints to-day without filtering. I have brought some of the baryta-surfaced paper with me, and shall be pleased to give a sample to members who wish to experiment. I should advise to coat half a sheet at a time or less at first. It is best to coat in a cool room, transferring the sensitised paper to a warmer one, but not to dry by heat. [The speaker here coated a sheet of paper with the collodion emulsion.]

To tone the prints I use Obernetter's toning formula, which can also be used with the gelatino-chloride prints. It is composed of the following:—No. 1. In 35 parts of water dissolve 5 drachms of sulphocyanide of ammonium. No. 2. In 15 drachms of water dissolve 15 grains chloride of gold. Into 100 parts of No. 1 pour 10 parts of No. 2, not *vice versa*. In my own practice I dilute this with an equal quantity of water. As you will observe, their appearance in the toning and following solutions are by no means prepossessing, which as you all know is the case with many things that conceal beauty in some shape or another.

J. HUBERT.

ALBUMEN PAPER.

THROUGH twenty years of practical experience with albumen paper have come in contact with nearly all the ailments connected with its working, and most of this time have looked for some new formula to make better tones, more brilliant whites, and half tones. Year by year I am more convinced that gold, silver, and other material, go but little toward making fine work, but we may profit by the old woman's experience, who said of her good cooking that she seasoned everything with a good deal of good judgment.

Many have made inquiries as to the manner of washing, toning, and fixing albumen prints, but it is so very simple that it seems unnecessary to explain the process. It appears to me that one of the great causes of failure is a desire on the part of many beginners to try to work complicated formulæ, thinking the more ingredients they get the better their work will be. In the first place, the tone of a photograph is made in the negative, and whatever the quality of it is so the tone of your print will be. Some say if you use a little of this and more of the other you will get certain tones. I do not believe it. Take a first-class negative and any of the well-known brands of albumen paper, float one minute in a bath containing from forty to sixty grains of nitrate of silver to the ounce of water, according to the temperature. This is the best formula known to me. Then wash your prints in two or three changes of water, just long enough so that the gold will not precipitate the chloride of silver on the print. Then

immerse in water with a small amount of salt, and you are ready for toning. Before commencing to wash your prints make a gold solution as follows:—One grain chloride of gold to eight ounces of water neutralised with any alkali. I use carbonate of soda to make it rather alkali, adding about one teaspoonful of common salt, and you can produce any tone from a rich brown to the finest purple-black.

On the other hand, take a poor negative and use all the means known to the photographer and I have yet to see a first-class tone. All this is supposed to be done when the silver bath is fresh, but after continued use it soon becomes disordered, and this is where the trouble begins. It may become weak, and then the prints come out mealy, and sometimes the paper has a mottled appearance. The way to overcome both these difficulties is to add more silver. After several times strengthening it becomes filled with albumen, and this forms a compound with the nitrate that is apt to soften the albumen, and it slips from the paper when being handled. The only remedy I have found for this is to boil the solution down, fuse, and add new silver, when it will be again ready for use. After fusing a few times, the bath is liable to become alkali and dissolve the albumen from the paper. The addition of enough nitric acid to bring it to a neutral point is all that is needed to make it right for using again.

Care should be taken not to get the bath too strong, as it is liable to give a sunken appearance, showing a mottled look like that produced by a weak one. My experience has taught me to avoid extremes in all things connected with albumen paper—that is, not to have the bath either too weak or too strong, and, by so doing, produce the most brilliant prints. Likewise avoid all kind of dodges recommended for making better prints, as every ingredient added to the mixture soon forms a compound of which you cannot tell the nature.

—*Photographic Times.*

II. McMICHAEL.

SILVER PRINTING ON ALBUMENISED PAPER.

[A Communication to the Photographic Society of Philadelphia.]

I BELIEVE myself justified in making the assertion that photographic printing has not essentially changed during the last twenty years. If this be true, it might seem to be an easy matter to deduce such principles from the practice of the best operators as would lead to the laying down of fixed rules from which no departure could be made, save at the almost certain penalty of failure in one or another of its forms.

Practical experience in photographic printing, however, as well as a knowledge of the practice of others, would rather teach us that success in this direction is hardly to be obtained by reducing, or attempting to reduce, the matter to scientific principles, but that empiricism (if I may use the word) is both easier and safer. I doubt whether there is a single operation in the whole routine of silver printing that has not been fought over by the advocates of different manners of working, the result being finally left undecided.

Remembering that prints are really a secondary product of photographic manipulation, I think that the reason of this clashing of opinion, to which I have just alluded, may be found in the character of the negatives used, in the paper, and in the whole practical routine or handling. As full consideration of these three factors would be impracticable here, let me generalise my remarks rather than attempt to give rules for working.

As far as we can gather from our knowledge of early practice in silver printing, it seems pretty clear that the fine effect in the print was formerly sought for by using a strongly salted paper, flooded on a correspondingly strong silver bath, and used without fuming with ammonia. The negatives were also probably much more intense, or had greater contrast between light and shade. The paper itself was thicker. Inasmuch as it was an expensive matter to work silver baths of from eighty to one hundred grains per ounce, the quantity of soluble chloride in the paper was reduced together with the strength of the silver bath. It had been definitely ascertained that over and above the quantity of nitrate of silver necessary to convert the chloride, a certain excess of silver was indispensably necessary.

As is so often to be remarked when changes take place in scientific practice at large, the pendulum swung so far in the other direction that baths of even twenty to thirty grains per ounce were advised, as well as the addition of other soluble nitrates which were claimed to supply, in part at least, the place of the silver salt. Such ideas are now forgotten, as they well deserve to be. The strength of the bath for ordinary work might be taken at, say, fifty grains per ounce, reducing to forty in hot weather, and perhaps increasing to seventy in cold weather or weak light. I must again beg you to remember that I am here making no attempt at a regular formula.

The failures, arising from disproportionate strength of bath to paper, would be more noticeable in the case of an unduly weak solution. The paper would print slowly, and lose much of its strength and brilliancy in toning and fixing, while the only troubles to be anticipated from too strong a bath would be an increased tendency to discolour (particularly in warm weather), and perhaps to the formation of what are technically known as "tear-drops."

The characteristics of a perfect negative for printing would be difficult

to define closely, even if we had the negatives before us, and, of course, still more so in words. Laying aside all technical imperfections, we can say that the perfect negative is the one that will give a complete scale of tone (or light and shade) in the print, varying from black to white.

Where prints of the finest quality are desired, it is of every importance that they be printed in a light whose actinic power will suit the negative and the paper.

The well-known rule of printing strong negatives in a strong light and weak negatives in a weak one, should always be borne in mind. I have found it better to subdue the great strength of the sun's light by pasting layers of white tissue-paper over the printing frame, in the case of weak negatives, rather than to leave the frame open and print in diffused light. By following this plan, I have often obtained vigorous prints from negatives thin enough to give very effective solar enlargements on albumenised paper. Of course, this is a tedious operation, and I do not by any means advise that negatives should be made so thin as to require this treatment. But, as any landscape photographer who has had experience with the inconstancy of Dame Nature and chemicals will know, the negative does not always turn out just as we might wish. I have also been led to believe that the strength of the light in which the print is made has an influence upon the tone of the print; and let me here remind you of the great law in photography, that a weak light acting for a lengthened time upon photographic tissues gives very different results from a strong one acting for a short time.

The strength of the silver bath I have already spoken of, but let me refer to it again, merely to say that I believe fully in the principle of using weak baths for weak negatives and strong baths for strong ones.

All that can be said about fuming can be summed up when we say that the paper should be *absolutely dry* (heat being used if required) before being subjected to the ammonia, and that the latter should always be as strong as possible. Ten minutes in strong ammonia ought to be enough.

It would perhaps be difficult to answer the question why so much stress has always been laid upon the formula by which the toning bath is made, and it is easy to see how a beginner, taking up the literature of the subject, is involved in great perplexity among the numerous recipes given.

The amount of free silver left in the print after the preliminary wash will have a direct influence upon the whole process of toning. The theory was laid down by Hardwich, that no print containing free silver could be successfully toned in alkaline chloride of gold, but it is doubtful whether this is strictly true. When we consider that nitrate of silver has not only a peculiar affinity for gelatine and albumen, and is removed with difficulty from either of these organic substances, it is questionable whether prints supposed to be washed free from silver are so in reality.

To get rid of the last traces, we should probably have to soak the print for a long time in a solution of some chloride or other haloid, and it would then be found that the pale brick-red colour so obtained would not tone up to the brilliant, vigorous black or purple. The treatment by the lime bath would seem to help us in sustaining this theory, for excellent results are to be had by simply immersing the print in the toning solution without any preliminary washing whatever. The free chlorine in the lime bath immediately acts on the free silver to a greater or less extent, after which the toning proceeds uniformly even, in spite of the heavy deposit of chloride of silver that forms on the face of the print. To the question, "How much shall the print be washed?" I do not believe that a positive answer can be given. Presupposing good water supply, and ample room in the tanks (a most important thing), it might be said that from ten or fifteen to twenty-five minutes would be about right; the print, of course, not being allowed to stick together in masses. I have seen excellent results obtained by merely soaking the prints a few moments in water which was changed once, and followed by a wash of one ounce of No. 8 acetic acid to every gallon of water; after they had slightly reddened the acid was poured off, and the dish filled up again with plain water. The toning bath was gold with acetate of soda, kept for about twenty-four hours before using.

In the ordinary alkaline toning bath, the presence of too much free silver in the prints will manifest itself by unequal action on the print, mealiness, and diagonal red lines. It is a safeguard to have a saturated solution of common salt close at hand, so that a little may be added to the bath if the washing has been insufficient. In such cases, the bath will generally be cloudy from chloride of silver after the prints have been toned. An important practical point is that there should be *white* light enough to enable the change of colour to be distinctly seen. Subdued daylight is best, but gas at night may also be used. I have always judged of the tone by reflected light, that is, by the face of the print; not by looking through the print, as some very successful operators are in the habit of doing. The prints must be well rinsed after toning, and of course it is necessary not to expose them to light more than is absolutely required.

I was much surprised a short time since to learn that it was a common practice not to throw away the hypo fixing bath, but to keep it over from day to day. I mention this only to condemn it; for, although fine results may be made, the tones are probably due to a sulphuretted action fatal to the permanence of the print, as well as the risk of imperfect fixation, owing to the bath becoming weaker by use, and losing its solvent properties. I would urge not only that the solution be strong, but that a liberal quantity be made up fresh for each day's use, and that the prints be kept constantly moving, so as to ensure thorough action. If economy must be rigidly observed, it would be better to let the bath after use simply

stand in the dish until strengthened enough by evaporation to fix negatives. Commercial hyposulphite of soda I have never seen show an acid reaction.

The same general ideas as regards washing of prints before toning might hold good in the washing after fixation. That is to say, I believe that too much stress has been laid upon prolonged washing. Rapid change of water, and constant moving of the prints, with every now and then draining off the water completely, ought to finish the process in from two to five hours, according to circumstances. The best safeguards against blisters are to see that the paper is not too very dry before silvering, and to pass the prints from the hypo into a strong solution of common salt. The dish containing them may be set under the tap, and the solution slowly diluted by allowing a small stream to flow in, the washing being afterwards carried out as usual.

Let me now roughly outline a routine of printing which I have myself followed successfully. The room used for the purpose should have a southern exposure. The paper, of course, may be floated anywhere, and the silver bath may be fifty grains to the ounce. My favourite formula contains half an ounce of aqua ammonia to every quart of solution, the brown oxide of silver being taken up again with a few drops of strong solution of nitrate of ammonia. This leaves the bath strongly alkaline, and enough nitric acid should then be added to nearly, but not quite, neutralise it. If a few drops of saturated solution of alum and about ten per cent. of alcohol be added, they will increase the coagulating power of the bath. The paper may be floated the night before in cool weather; and if anything occurs to prevent it from being used on the following day, it should be laid under pressure between sheets of white blotting-paper, previously soaked in a saturated solution of bicarbonate of soda and dried. The paper thus protected will keep good for many days, and, I believe, would give results superior to the ready sensitised paper now so much in vogue. Fuming should not be done until just before printing. The negatives may be sorted over, placing the strong ones and the weak ones together, and having tissue paper, cut to the proper size, ready to paste on the frames, as before alluded to. The various dodges for double printing need not detain us here; but if it be attempted, skill and care will be required. A sufficient quantity of chloride of gold solution, one grain to the drachm of water (stock solution), is measured out, allowing, say, one grain to the sheet. This is carefully neutralised, either with bicarbonate of soda or borax, and allowed to stand while the prints are passed through several changes of water. I have generally used the toning bath at the strength of one grain to five ounces of water, taking care to have the solution lukewarm in winter weather. The bath when ready should be nearly free from the yellow colour of the gold. If the prints tone unevenly, add a pinch of common salt to every ten ounces of bath. The fixing bath may contain an ounce of hypo to six of water in summer, or four in winter, and should be made up with warm water, to compensate for the refrigeration caused by the dissolving of the hypo. The prints may be left in from ten to fifteen minutes.

I would again insist upon having the dishes and washing tanks large enough to accommodate the prints with ease. The paper should be silvered in whole sheets, and very effective dishes for the purpose may be made of wood, protected by paraffine, a hot iron being used to melt it and drive it well into the pores of the wood. Washing tanks might be made in the same way, but porcelain only should be used for toning and fixing. If the water be full of finely-divided mud, it will be necessary to drain the prints well after removal from the wash water, and dabble them about in a gallon or two of well-filtered water, such, in fact, as is used at table.

ELLERSLIE WALLACE.

LIMELIGHT MATTERS.

MR. LEWIS WRIGHT, in his remarks under the above heading, says he should like to know from some one who has practically tried the patent automatic gas regulator for compressed cylinders, if they answer when the taps of jets are turned off. As I have used these valves on oxyhydrogen, triple, and biunial lanterns, and on single lanterns with the oxyether light, it will be interesting to your readers as well as himself to know that they do act perfectly, in fact, a gas cylinder with an automatic valve attached is practically the same as an average weighted gas bag. The light, however, obtained from the cylinder and a mixed gas jet, is far in advance of that obtained from an eight or ten feet gas bag with three or four fifty-six pound weights on. Mr. Wright questioned my figures as regards price of pressure board, and says he was able to get a large size one made for 18s. 6d. The material of a first-class double pressure board with prop (ironwork and wood) cost about £1, and it takes two days to make it properly, so he must have been exceptionally favoured, or lucky, in finding a carpenter to work so cheaply, or if made at a venture, which probably it was, the carpenter had nothing to be thankful for for the order. If prices are quoted, I think it is only fair that they should be commercial, and not what an odd article can be found for. I think Mr. Wright will call to mind that the price of prisms he mentions in his valuable book on *Light* is certainly not commercial if a fair quality is supplied.

The price of the gas when supplied in cylinders is no doubt somewhat prohibitory, but this I have good reason for believing will soon be remedied; for at my (and probably other exhibitors) suggestion the compressor of oxygen will act on my oft-repeated advice and shortly supply ordinary

customers through any optician at 6d. per cubic foot, in quantities of not less than twenty-five feet. When it is considered that the new steel bottles are of less bulk and much lighter weight to hold this quantity than the iron ones that hold fifteen feet, and that the gas does not deteriorate by keeping, it follows that there is no waste if judiciously used, and so an element of economy over the bags is introduced; for it is seldom that one or two feet of gas is not left in the bag after an entertainment. The automatic valves can be set to any pressure by modifying the spring that presses on the indiarubber bellows, but they are generally set to twelve inches water pressure, and the Archimedean screw and valve work so perfectly that the increase when stopcocks are turned off is not more than three inches at the outside, in fact the tubes cannot swell to blow-off, and the difference in pressure due to friction and everything is imperceptible. As a proof of the satisfactory working of the automatic regulators, it may be stated that a customer of Mr. J. H. Steward's had a pair down on trial, and thoroughly tested them in connection with a biunial lantern, and also in comparison with valves made on the principle of steam-engine valves, with lever and weight, and was so pleased with the simplicity of the action and ease of working that he decided to keep them, and use them in preference to the others or bags.

G. R. BAKER.

ART IN AMERICA.

PROFESSOR HERKOMER, A.R.A., Slade Professor of Fine Art at Oxford, when lecturing at Toynbee Hall recently, gave some account of America as seen by an artist's eyes. America has begun her art career with architecture, and, in Professor Herkomer's opinion, this was quite right, architecture being the beginning of all art. Art, however, in the sense of painting has not yet much hold in America, according to the Professor.

"I don't mean," he said, "the possession of pictures. In America they make plenty of money, and if a man fails he can begin again, and does not lose prestige. Art in America is not strong at present. The best work done lately in all the art schools of Europe has been done by American students. At the same time, no painter in America, or very few of them, are happy in America. It will take a long time for art to become a real thing there. It needs infancy; architecture and even sculpture can be taken there, and will grow; but art, in the sense I am talking of, must grow from the beginning. Painters who go there find that art transplanted dies out, or if any keep it alive, in some sort, they have to come perpetually to Europe to nourish it. One reason for this is the want of sympathy between the American patron and the artist. Before the war had run its course, some American landscape painters, who had studied in Europe, painted huge landscapes of the Rocky Mountains and other picturesque parts of America, and they had to paint with the brush in one hand and a revolver in the other. They worked the oracle, and sold these pictures for large sums—£5000 and even £10,000 each. But when Americans began to travel, and found that only £500 or £1000 was paid for big pictures here, and when the railway enabled them to see the Rocky Mountains comfortably, they felt that they had been cheated by these artists. They did not know; they had not time for knowing; so they said, 'We will wait, and not trust any artist but who has an European diploma.' A feeling of that sort is hereditary; I believe a person is born with the suspicions of his forefathers. Dealers have done a great deal of damage to America; so it comes that nine out of ten painters in America cannot get their living without teaching."

About a year ago Professor Herkomer went over there again, and stayed five months, engaged in portrait painting. He never worked for a more appreciative people. He was struck by their power of reading character. It was not respectable to read character here, but it was all the mode there. He painted a trader, now worth a million sterling, formerly a seller of apples in the street, and this man said to him, "You must get my eyes; I trade on them." He painted Jay Gould, and reading character was one secret of that man's success. Professor Herkomer attributed the enterprise, the activity, the go-a-headedness of the Americans largely to their climate, dry and electric as it was.

Remarking upon the character of American society, he described it as being as refined as in England, without snobbery. America was going to do the greatest in most things, in art amongst the number. "We have," he said, "an American painter who has brought a strange style into our Academy. By a remarkable accident his picture was hung in a conspicuous place. It was like a fresh breeze coming into the Academy. Some were frightened at it, but most of us welcomed it." The lecturer gave some account of his experiences of portrait painting in the United States, and in conclusion spoke of the reverence of Americans for England, and of the desirability of our learning from them how they learned from us.

A CAMBRIDGE ELECTRIC LIGHT STUDIO.

WE have received from Mr. Valentine Blanchard, jun., Cambridge, the following account of the electric light installation in his studio. As the candle power seems so extraordinary for the motive power, may there not be a mistake by a unit?

"The entrance to the establishment is fitted up with an arc lamp, which

gives a light of about 10,000-candle power, and which brilliantly lights the entrance and thoroughfare for a considerable distance. The reception and dressing rooms are lighted with Swan-Edison incandescent lamps, each of thirty-two-candle power, which give a cheerful and pleasing appearance, and show off the numerous specimens of photography to advantage. The studio is also fitted up with four incandescent lamps of the same candle power, which are used for posing, focussing, &c.

"The large arc lamp for the studio, which gives a light equal to from 30,000 to 40,000 candles, is fitted with a reflector about three feet six inches in diameter, and by a simply contrivance a soft light is diffused upon the sitter, the direct rays of light from the arc being shielded. The dark room is fitted with a Swan-Edison incandescent lamp of eighteen-candle power, screened with ruby fabric, giving a uniform and comfortable light for development. The dynamo is worked by one of Crossley's well-known gas engines, fitted with an electric light governor. Mr. Blanchard finds that six-horse power is sufficient to work all the lamps at one time. By the use of opaque blinds to cover glass of studio, the electric light can be used any time during the day."

CONTINENTAL PHOTOGRAPHY.

[Translations and Abridgments.]

GERMAN AMATEUR AND PROFESSIONAL PHOTOGRAPHERS.

DR. VOEL says that a professional photographer has recently written to him about the increasing number of amateurs, and asking if he can do anything to check the augmentation, because it is doing injury to trade; the writer suggested that photographic chemicals and other articles should be sold to amateurs at a higher price. Dr. Vogel replied that he was accustomed to these complaints, and that if they increased, the fact was due to the progress made by amateurs. He spoke of the great advances amateurs had made in photography, and cited by way of example the names of Daguerre, Talbot, Niepce, Archer, Bennett, Wortley, and others. Musical amateurs do no harm to the musical profession, but rather the reverse. Amateurs are not responsible if they exercise an adverse influence upon the business of professional photographers, for that would merely indicate that the latter have not attained the highest photographic skill; the true remedy is to turn out better work. The photographer who is also an artist does not fear the amateur, he knows the limits of the power of most of them; they lack skill and taste in posing models, they commonly make errors in the mode of lighting, and they cannot do skilled retouching. The strength of the amateur, therefore, lies chiefly in dealing with landscape and architectural subjects, consequently here his competition is felt by the professional, and as a matter of fact the person who complained to Dr. Vogel is a landscape photographer.

Some time ago a Munich architect gave an order which included the photographing of several monuments in Berlin; these photographs were executed by a portrait photographer, but gave no satisfaction to the architect. This came to the knowledge of an amateur who could do such work well, and he received an engagement to take all the required photographs. Dr. Vogel recommends professional photographers to study their work to its roots, to read everything published about photography, and to obtain full knowledge of everything relating to the advance of the art. A professional who had not done these things once heard an amateur talking about photography with the salts of platinum, and exclaimed, "What! Print with platinum! That is not possible or I should have known it!"—*Photographische Notizen*.

ORTHOCHROMATIC PLATES FOR LANDSCAPE WORK.

Dr. Vogel has repeated the experiments made by Obernetter in the photographing of landscapes upon orthochromatic plates, and found the advance upon the results given by ordinary plates to be surprising. When the ordinary negative is examined by itself, all appears to be perfect; all is sharp and every leaf can be seen. But when this is compared with the orthochromatic negative the differences are perceptible. In the latter each tree can be distinguished from its neighbour, consequently there is remarkable relief in the image; the green of the acacia can be perfectly distinguished from the green of the willow, and that of the poplar from that of the oak, where upon the ordinary plate all appears uniformly grey. Unhappily, Obernetter's plates prepared with bromide of silver, azaline, and erythrosine will not keep many days, and his efforts to make them keep have not been attended with good results; the exposure is three times and sometimes four times as long as with ordinary plates.—*Photographische Mittheilungen*.

THE PHOTOGRAPHIC-SCIENTIFIC EXHIBITION AT BERLIN.

In the above Exhibition held at the Academy of Arts of Berlin, were magnificent photographs of the sun by Dr. Lohse, of Potsdam, and Dr. Janssen, of Paris; a photograph of the nebula in the Pleiades discovered by photography; photographs of the planets by Henry, of Paris; stellar spectra by Pickering, of Boston; and, above all, the great solar spectrum of Rowlands, having a total length of thirty-six feet, taken by concave diffraction gratings and extending almost to the sodium line D. The landscapes include among others some remarkable views of America, and of the Yellowstone Park on sheets of fifty centimetres, also some photo-

graphs by Obernetter demonstrating completely the superiority of orthochromatic plates. As for instantaneous views, those of Anschütz are the most striking. There are also photographs of flashes of lightning by Kaiser and by Jacobsen, likewise a photograph of the aurora borealis of Tromholt; there are also the balloon photographs of the Chevalier von Seld, and the moonlight and twilight pictures by Dr. Vogel.—*Photographische Mittheilungen*.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 2555.—"Improvements in Photographic Shutters." W. D. RICHMOND.—*Dated February 18, 1887.*

No. 2634.—"An Improved Photographer's Lantern." F. BISHOP.—*Dated February 19, 1887.*

No. 2662.—"Improved Photographic Film Paper." L. WARNERKE and SILVERHOUSE.—*Dated February 21, 1887.*

PATENTS COMPLETED.

IMPROVED FORM OF DEVELOPING BATH, ESPECIALLY FOR LARGE PHOTOGRAPHIC PRINTS.

No. 3061. BENJAMIN HOWARTH THWAITES, F.C.S., 37, Victoria-street, Liverpool.—*March 4, 1886.*

My improvement consists in the method of forming and constructing developing baths, especially for large photographic prints, such as copies from engineering drawings.

I make my developing bath in the form of a rectangular receptacle sufficiently deep to hold prints lowered in vertically and end-ways. To make the bath portable I provide wheels on which it can run, I make the lower end or bottom of the bath rather wider than the top, the width I usually adopt is five inches at the bottom of the bath and four inches at the top; by this arrangement I prevent the prints from becoming attached to the sides.

On each side of the bath, close to the top edges, I provide drying rods, attached to the bath by small brackets; under these drying rods I provide drip troughs into which the moisture runs or drops from the prints when they are hung on the drying rods.

I provide draw-off corks to both the drip troughs and the bath.

For ferro-prussiate prints I construct the bath of a framework of wood, lined internally with sheet zinc.

I strongly brace the woodwork together in any ordinary manner, but I usually use hoop iron straps.

For prints in which there is required an acid developing solution, I line the inside of the bath with any acid-resisting material, such as gutta-percha, vulcanite-enamel, or porcelain; if the bath is formed of sheet iron I may enamel it, or I may form the bath entirely of porcelain or earthenware.

In order to assist or facilitate the lowering of the prints into the developing solution, I provide simple clips such as the ordinary letter clips; these I attach to the lower end of the print before lowering it into the solution. For acid solutions I form the clips of vulcanite.

I provide strips of wood, pieces of glass, vulcanite, or wire on which to hang prints when in developing solution.

I may provide a loose cover for covering the upper end of the bath to protect the developing solution.

The advantages of my invention are, that the bath occupies far less space than the present form, and for ferro-prussiate prints the water can be used for weeks without requiring any renewal; as all the salts fall to the bottom of the bath the supernatant water is kept quite clear.

Two or three or more baths can be placed in close proximity when more than one developing solution is required, the whole group occupying very little floor space.

The developing process is much more rapidly effected than with the ordinary flat-bottomed bath.

The claims are:—1. The arrangement of a developing bath, substantially as herein shown and described, for large photographic prints. 2. The use of one or more developing baths placed side by side, substantially as herein shown and described. 3. The combination of said bath with printing frame, substantially as herein shown and described.

IMPROVEMENTS IN OR RELATING TO PHOTOGRAPHIC CAMERAS AND SLIDES OR APPURTENANCES THEREOF.

No. 4179. JOSEPH DAVID WILLIAMS, Station-road, Greenfield, Holywell, Flint.—*March 25, 1886.*

This invention has for its object an improvement in the cameras and appurtenances at present in use, so as to enable the operator to focus and expose without withdrawing any part of the slide proper from the camera, thus obviating one very fruitful source of fogging.

The frame forming the end of the camera has a curved contour, where it rests on the camera bottom so as the more easily to be adjusted. A slide in this frame is formed in two parts, a ground-glass for focussing, and a recess in which is placed a slide or holder carrying the sensitive plate or paper.

A shutter slides laterally in grooves in the sensitive plate slide or holder. It has an attachment at back, which engages with a cross bar or slide. The sensitive plate slide is preferably formed double with two sliding shutters, one on each side. The slide with its shutter (or shutters if a double plate carrier) is fixed in the recess in the frame, and prevented from falling out by movable catches. A stop is provided to prevent the shutter or any part encroaching on the focussing glass. A spring or other stop locks the slide in position. The slide carries the focussing glass, and the sensitive plate holder is supported in the frame between two feathers, and the entire frame is held in position in the

camera by means of an ordinary sliding bracket. A pin on the frame fits into a slot in the bracket. A door at the back of the camera provides for taking out the sensitive plate slide holder, with its shutter or shutters. This consists of a box with shutter for a lid and an opaque back to hold a single plate, or two compartments with an opaque dividing plate between and two sliding shutters. An opaque dividing-piece is hinged between two frames. Two shutters or their equivalent are required for this, one at each side. These are held to it by spring clips or other mechanism, allowing the shutter to slide. The specification is illustrated.

AN IMPROVED PROCESS OF MANUFACTURING ISOCHROMATIC EMULSION PLATES HIGHLY SENSITIVE TO LIGHT.
No. 15,532. Dr. HERMANN WILHELM VOGEL, 124, Kurfürsten-s-trasse, Berlin.
—November 29, 1886.

My invention relates to an improved process of manufacturing isochromatic gelatine and emulsion and gelatine plates for photographic purposes, and to chemical preparations requisite for such said process.

In the year 1873, I made the discovery that chloride and bromide of silver, which are only sensitive to violet, indigo, and the blue light of the spectrum, can be made sensitive to green, yellow, and red rays by mixing the above-mentioned salts with bodies which absorb the latter rays.

If, for instance, chloride or bromide of silver is mixed with aniline red, which absorbs yellow rays, the chloride or bromide will become sensitive to yellow rays; or if chloride or bromide of silver is mixed with aniline green, which absorbs red rays, the same will be made sensitive to red rays.

I denominated these bodies, which sensitise silver salt in the aforesaid manner, optical sensitisers, and I and others after me have discovered a large number of such optical sensitizers amongst the dyes, and in this manner the so-called isochromatic gelatine plates, coloured with an optical sensitiser such as cyanine, chinoline red, eosine, erythrosine, are now articles of commerce.

All these isochromatic gelatine plates are generally less sensitive than ordinary plates and require a yellow glass plate interposed between the lens and the sensitive plate for diminishing the power of the blue light.

By this interposition of a yellow plate the time of exposure was lengthened, and if the surface of the plate was not quite even, the sharpness of the photograph was lost, so that these isochromatic plates are used on a small scale only for the reproduction of pictures or paintings, but not for portrait or landscape photography.

Now I have succeeded in making isochromatic gelatine plates, the sensitiveness of which is twice as great as that of the ordinary gelatine plates, and which do not require any yellow plate or screen.

This discovery is based—

1. On the application of the eosides of silver, that is, the chemical combinations of eosine dyes with silver. These eosine dyes or derivatives of fluoresceine are all acids, and combine with silver to salts.

2. On the addition of silver salts to other optical sensitizers, for increasing their sensitising power.

As early as 1884, I observed this favourable influence of the presence of silver salts, and proved, for instance, that eoside of silver will give ten times more sensitiveness for yellow light than ordinary eosine, but I have only now succeeded in making plates without fog or film or spots, so that I can introduce the process into practice, and I have proved that it is possible to produce in this manner landscapes and portraits far superior to those taken with ordinary plates.

I have now invented the following methods for making highly sensitive isochromatic plates or sensitising solutions, so that any photographer or amateur can prepare his own isochromatic plates.

In order to attain this object I proceed as follows:—

1. Ordinary gelatine plates are bathed in a solution of a soluble salt of silver (1 : 1000), then in a solution of an eosine dye, or a mixture of eosine dyes, or a mixture of an eosine dye with other optical sensitizers, with or without liquor of ammonia. The solution of the dye can also be used first and the silver solution afterwards, or an emulsion can be mixed with a soluble salt of silver and the dye added to the mixture, or *vice versa*, and with or without ammonia.

2. A silver eoside is formed by mixing a solution of an eosine dye or a mixture of different eosine dyes (for instance, ordinary eosine, blue-tinted eosine, chrysoline, aureosine, phloxine, Bengal rose, or any other derivative of fluoresceine), with a soluble salt of silver, such as sulphate, nitrate, acetate, or fluoride of silver.

This eoside of silver can be collected as a precipitate, washed, and mixed with the emulsion, or dissolved in diluted ammonia or diluted acetic acid, and employed as a bath for soaking dry plates; but I prefer to add liquid ammonia, carbonate of ammonia, or acetic acid, during the process of precipitation, so that the suspended precipitate is dissolved, and to employ the same as sensitising agent for fluid emulsions, or the said solution can be diluted with water and used as a bath for dry plates. The quantity of this solution of eoside of silver to be employed varies according to the quality and kind of emulsion treated with the same, although the following formula will serve as a general guide for those employing my sensitising solution:—

Fifty cubic centimetres of a solution of an eosine dye (one part dye to one thousand parts water or diluted alcohol), one cubic centimetre of a solution of nitrate of silver (one part nitrate of silver to twenty parts of water), one to two cubic centimetres of liquor ammonia.

This solution is either mixed with the emulsion, that is, five to ten per cent. is added to the emulsion, or the same is diluted with two hundred to five hundred cubic centimetres water, and the gelatine plates immersed or soaked in the same for about one minute and then dried.

3. I furthermore use other dyes, known as optical sensitizers, which do not chemically combine with silver, but the sensitiveness of which is much improved by the presence of a soluble salt of silver, such, for instance, as cyanine, chinoline red, coruline, &c., and mix them with any soluble salt of silver. I employ, for instance:—

Fifty cubic centimetres chinoline red, or a mixture of chinoline red and cyanine (solution 1 : 1000), one, five to three cubic centimetres nitrate of silver (solution 1 : 20), fifteen cubic centimetres ammonia liquor.

This solution is employed in the same manner as the eoside of silver solution described under 2.

I furthermore employ the solutions described under 2 and 3 in varying proportion for improving the sensitiveness for any part of the chromatic spectrum.

4. I likewise employ, in like manner as mentioned under 1, 2, 3, the salts of lead which produce, when mixed with an eosine dye, eoside of lead, which said salts can be employed alone or mixed with eoside of silver.

I furthermore employ the insoluble salts of silver, such as the chlorides tartrates, citrates, &c., dissolved in ammonia or acid.

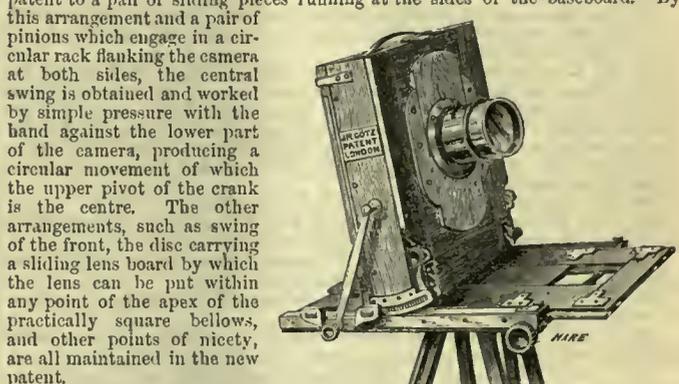
I do not confine myself to any of the proportions of the mixtures as given in the foregoing specification, as the same can be varied according to requirement, without in any way departing from the nature of my invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—1. The application and employment of the chemical combinations of silver or lead, with an eosine dye or eosine dyes, for producing highly-sensitive isochromatic emulsion or gelatine plates, substantially as and for the purpose set forth in the foregoing specification. 2. The application and employment of dyes, known as optical sensitizers, in combination with the salts of silver, substantially as and for the purpose set forth in the foregoing specification. 3. The application and employment of various dyes, as mentioned in claims 1 and 2, in combination with soluble salts of silver, substantially as and for the purpose set forth in the foregoing specification.

4. The manufacture of combinations or solutions of dyes and silver as strong optical sensitizers for colouring gelatine emulsions, or as bath for gelatine plates, substantially as and for the purpose set forth in the foregoing specification. 5. The application of silver salts not soluble in water, but in ammonia or acid, substantially as and for the purpose set forth in the foregoing specification.

NOVELTY IN PHOTOGRAPHIC APPARATUS.

Mr. J. R. GOTZ, of 19, Buckingham-street, Strand, has just patented a new form of portable camera which marks a departure in camera making. The chief feature is the suppression of the slotted stay or fork common to all field cameras. This is replaced by a solid crank or stay fixed as in his previous patent to a pair of sliding pieces running at the sides of the baseboard. By this arrangement and a pair of pinions which engage in a circular rack flanking the camera at both sides, the central swing is obtained and worked by simple pressure with the hand against the lower part of the camera, producing a circular movement of which the upper pivot of the crank is the centre. The other arrangements, such as swing of the front, the disc carrying a sliding lens board by which the lens can be put within any point of the apex of the practically square bellows, and other points of nicety, are all maintained in the new patent.



The folding and setting up of the camera are equally easy of execution, and the facility of bringing the front and back together—practically closed—on the centre of the baseboard without any extension of the latter are points of value.

The accompanying illustration gives a fair idea of the general arrangements. This patent is destined for whole-plate size and upwards, while the smaller sizes are worked on the old patent described by us a few months ago.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
March 1	Bolton Club	The Studio, Chancery-lane, Bolton.
" 1	Sheffield	Masonic Hall, Surrey-street.
" 1	Sutton	Society's Rooms, 18, High-street.
" 1	Paisley	
" 1	North London	Myddelton Hall, Upper-st., Islington
" 1	Holmfirth	
" 1	Glossop Dale	Society's Rms., Norfolk-sq., Glossop
" 1	Coventry and Midland	Coventry Dispensary.
" 1	Carlisle and County	
" 2	Edinburgh Photo. Society	Hall, 20, George-street, Edinburgh.
" 2	North Staffordshire	Mechanics' Institute, Hanley.
" 2	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 3	Bolton Photographic Society	
" 3	Dundee and East of Scotland	Lamb's Hotel, Reform-st., Dundee.
" 3	Glasgow Photo. Association	Philosophical Soc. Rms., 207, Bath-st.
" 3	Leeds	Philosophical Hall, Leeds.
" 3	London and Provincial	Mason's Hall, Basinghall-street.
" 4	Yorkshire College	
" 4	Halifax Photographic Society	M. Manley's, Barum Top.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. William England, Vice-President, occupied the chair.

Mr. J. B. SPURGE exhibited the essential portions of a mechanical device he had made, partly in imitation of apparatus at South Kensington, to vary the size of the openings of a rotating disc, for use with a differential photometer.

Mr. W. K. BURTON said he thought that there was an error in measuring by such means, but he did not like to enter into the matter in the absence of Captain Abney; he thought that the ratio was not the same in the case of contact with a negative and in the case of a distant negative, owing in the latter instance to diffusion from the film.

Mr. W. H. HARRISON exhibited a print from an orthochromatic photograph taken by M. D'Haouw, of Ghent University, upon an ordinary plate and without a coloured screen, simply by waiting until nearly twilight, when the earth's atmosphere had reduced the blue in the light to a greater extent in proportion than the yellow. M. D'Haouw gave twenty minutes' exposure. He had written upon the back of the photograph the particulars relating to the taking thereof.

Mr. SPURGE remarked that as light was reduced contrasts were increased.

Mr. BURTON questioned that statement, for Mr. Spurge was assuming that the exposure was not correspondingly increased; if he were right the whole theory of the action of stops of different sizes was wrong.

Mr. SPURGE was making experiments on the point which were not yet finished.

The question was asked, "What is the best method of washing away the oxalate developer from bromide prints?"

Mr. BURTON added, he always put the developed prints at once into water slightly acidulated with sulphuric acid.

Mr. W. Conn had found the use of distilled instead of ordinary water to be useful in avoiding lime deposits.

Mr. ARNOLD SPILLER believed that a saturated solution of alum with a little acetic acid added would be good.

Mr. BURTON was not aware of any objection to neutralising with weak ammonia after a wash in weak acid.

Mr. FRANCIS COBB thought it to be necessary to do so rather than to put a print charged with weak acid into this sulphate of soda.

Mr. A. MACKIE believed the clearing of developed bromide prints to be the same in principle as the clearing of platinotype prints; the same method should answer for both.

Mr. W. M. ASHMAN asked if pure whites could be obtained with anything but ferrous oxalate.

Mr. SPILLER responded that hydroxylamine, as a developer, gave pure whites.

Mr. BURTON said that pyrogallol, carbonate of potash, and sulphite of soda would give pure whites.

Mr. W. E. DEBENHAM exhibited a large negative full of markings of the grain of the tissue paper against which the plate had been packed; he thought that the paper might have been damp, or have contained an impurity; it was the only negative he had taken in which that sitter had not moved, and if any tourist had taken abroad a batch of such large commercial plates, the results would have been seriously disappointing. The plate had perhaps been made three or four months ago.

Mr. W. COBB believed the paper to have been damp.

Mr. J. A. HARRISON thought that there was no doubt upon that point, for the expansion of the paper had been registered on the negative.

Mr. J. TRAILL TAYLOR said that a Philadelphia photographer packed large plates close together with nothing between them.

Mr. BURTON remarked that that was a good plan if they were so fixed as to prevent any rubbing.

Mr. MACKIE mentioned Mr. Dunmore's plan of so placing plates in pairs, with gummed labels at the edges, to prevent them from rubbing.

Mr. W. COBB had found the grass-bleached paper used by silversmiths to perfectly protect plates which he had taken to Rome for use in that city.

The CHAIRMAN had found it capital paper for the purpose.

Mr. FOX SHEW said that grass-bleached paper was of uneven thickness.

Mr. MACKIE questioned whether, in Mr. Debenham's case, the plate had not been damp, and not the paper. He should like to know what was the best intensifier which did not require the application of a second solution.

Mr. DEBENHAM said that bichloride of mercury would do for slight intensification, but care must be taken to stop the action before the whitening stage was reached.

Mr. TAYLOR believed that sulphide of potassium would answer the purpose. He had some films intensified with bichloride of mercury by Disderi about twenty years ago, and they were still as good as ever.

Mr. MACKIE said that Kennett's plan of putting a little sulphate of iron in the fixing bath was good.

Mr. SPILLER said that the action of the sulphate of iron was to reduce some of the hyposulphite of silver in the bath and to throw the metal down upon the image.

Mr. W. Conn stated that by continuing the action of bichloride of mercury too long the image was reduced.

Mr. ASHMAN remarked that one of the annuals stated that if washed negatives were flooded with shellac dissolved in an alkali and then dried they would be well protected during printing. If this were so it was a valuable and important fact.

Mr. MACKIE had tried it and found the negatives not to be proof afterwards against the action of the silver on the printing paper.

Mr. SPILLER said that if ammonia were used to dissolve the shellac it would afterwards go off and leave a waterproof film.

Mr. DEBENHAM stated that if Mr. Wellington's plan of preventing orthochromatic plates from fogging would do for all plates whatever it was a valuable thing. He soaked the plates in bromide and ammonia before developing.

The CHAIRMAN announced that at the next technical meeting the subjects would be bromide prints, and the obtaining of perfectly clear shadows in negatives in difficult cases.

The meeting then broke up.

enclosing mounts said to injure prints pasted upon them; the dealer had taken many of them back, but the manufacturer was "defiant," saying that they were everything desirable.

Mr. A. L. HENDERSON had boiled pieces of these mounts in distilled water, after which the water but slightly reddened litmus paper, so that there did not appear to be much acid in them from sour paste in the manufacture; he had tested the mounts in other ways, and obtained no adverse results. Of course all the mounts supplied to Mr. Stuart may not have been alike; he wished that the Chairman would test some of the samples sent. He had also received from a provincial photographer some prints with white spots upon them said to be due to bronze powder upon the mounts, and two other photographers who had examined them had come to the same conclusion; he (Mr. Henderson) could find no evidence of any action from the backs of these prints having found its way to the fronts, and through a magnifying glass it looked as if something had been splashed over the face of the prints.

Mr. A. COWAN thought that the paper was thin and had been rolled under very heavy pressure, which had brought out spots where the paper was thinnest.

Mr. W. M. ASHMAN said that the spots might have been caused by bronze, but nothing pointed to that conclusion. Once mysterious spots appeared on the prints of a Norwich photographer, and were found to be due to hypo which had filtered through the floor of the room above and crystallised on the ceiling below, from which disturbance brought it down on the prints as fine dust. The particular spots before the meeting might be due to hypo or to lime.

Mr. W. H. PRESTWICH, in a long experience, had never had spots on prints due to mounts or to any other cause.

Mr. HENDERSON had once been asked to paste the prints on the printed side of his mounts, as the purchaser did not want the prices to appear; in time the bronze printing did its work, and the price of the photograph became visible in white upon its face.

Mr. J. HUBERT then read a paper on printing by collodio-chloride [see page 119], prefacing it by a semi-humorous recitation in rhyme, for which we have no space at present. He followed this by giving a practical demonstration of the various operations.

Mr. J. TRAILL TAYLOR, remarking on the great success with which the demonstration had been given, proposed that all discussion on the subject be adjourned till that day week, which was agreed to.

CAMERA CLUB.

The Thursday evening meeting, February 17, was a members' lantern-slide evening, and some very excellent and unusually interesting subjects were shown.

About one hundred and forty slides were exhibited, of which eighty were by Mr. F. Dunsterville, a visitor at the Club. These made up a series illustrating scenes and manners in India, and comprised characteristic landscape and architecture, interiors and exteriors of Hindoo temples and palaces, studies of detail of the marvellous decorative work on the buildings, and groups and single figures of the natives—hill people, high caste, trading caste, dancing and nautch girls. Notwithstanding the difficulties, and even dangers, presented by the work in India, many of the slides were technically perfect, and, in all, the point of view or study has been most judiciously selected. Altogether Mr. Dunsterville must be congratulated on having a most interesting and valuable collection of negatives and transparencies, one which might with advantage be exhibited again, and which ought to be seen by other societies.

Messrs. Barclay and Mason showed views of the Thames up stream, and each included in his exhibit of views one making a charming picture.

Mr. Sage sent a series of slides representing landscape at and around Bristol and seascapes at Lowestoft.

The exhibition concluded with a selection by Mr. Gale, including picturesque country scenes with figures, also a fine study of barges on the river at Blackfriars Bridge after a snowstorm, in which the result was most artistic, the atmosphere being perfect. Another river scene has been made a most striking picture by the introduction of a magnificent cloud effect.

The subject for Thursday, March 3, will be a full demonstration by the Autotype Company of their carbon printing processes, as shown at their well-known demonstrations at Ealing Dear. Commence at eight p.m. sharp.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The annual general meeting was held at 181, Aldersgate-street, E.C., on Monday evening, the 21st instant.—Mr. J. Traill Taylor in the chair.

The minutes of the last annual meeting were read and confirmed, and a modification of Rule 3, recommended by the Committee, was adopted. As amended the rule stands as follows:—"Qualification of Members.—Any person connected with photography above the age of sixteen shall be eligible for membership on his or her own application, or on the nomination of a member, subject to the approval of the Committee."

The following were elected members of the Association:—Messrs. H. D. Atkinson, G. L. Adlenbrooke, J. J. Briginshaw, C. Bere, E. Clifton, F. W. Cox, S. Casbourne, F. P. Cembrano, W. Dallyn, J. Davidson, N. Deves, E. Dunmore, W. Few, J. Greathead, J. R. Gotz, H. W. Gorfin, H. M. Hastings, T. Hadow, F. Hellyer, A. L. Henderson, W. E. Halse, M. J. Higginson, A. J. Higginson, B. Lemere, L. Medland, H. Moul, J. Nesbit, W. H. Prestwich, G. D. Plomer, W. D. Richmond, J. B. Spurge, R. Spurr, H. M. Smith, G. Scamell, J. Spiller, J. M. Smith, W. S. Simpson, J. Traill Taylor, M. L. Troup, J. Urie, W. Willis, R. E. Wilkinson, C. H. Watkins, A. L. Watkins, J. W. Zaehnsdorf.

The SECRETARY then submitted the report and balance sheet for the year ending December 31, 1886, which showed satisfactory progress. Donations to the amount of £27 15s. 6d. had been received, and the annual benefit at the Photographic Society of Great Britain Exhibition realised £12 12s. 4d. A special lecture given by Mr. A. H. Burton, of New Zealand, produced £4 17s. 9d.; and members' subscriptions, £15 2s. 6d.; of this, with £192 0s. 8d. in hand at the commencement of the year, amounts to a total of £252 8s. 9d. The disburse-

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

On Thursday, February 17, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. A. Haddon presided.

A letter to Mr. Henderson from Mr. John Stuart, of Glasgow, was read,

ments were £24 7s. The report stated that, notwithstanding the great reduction in the subscription, the large class for whose benefit the Society was founded has not responded to the extent anticipated. Applications for assistance from non-members have been numerous, showing that the reduction of subscription has been a step in the right direction. The members recently elected (over seventy since September last) principally belong to a class unlikely to require aid from the Association, which affords a striking proof of general sympathy with the cause. The Committee solicit the hearty co-operation of all classes of photographic assistants, and wish to bring prominently under their notice the fact that the reduction of subscription necessitates augmenting the numerical strength of the Association at least fourfold. A hope is expressed that the more fortunately situated professional and amateur photographers who have hitherto withheld their patronage will now come forward and impart that impetus to the Association of which it stands in need. The thanks of the members are due to the President and Council of the Photographic Society of Great Britain for the special evening at their Exhibition; to the proprietors of THE BRITISH JOURNAL OF PHOTOGRAPHY, and the *Photographic News*, and others, for their liberal donations; they are also due to Mr. A. H. Burton for his able lecture; and to the photographic journals for their courtesy in publishing the proceedings of the Association.

The report was formally adopted after a discussion in which several members joined.

The election of officers for the ensuing year then took place:—*President*: J. Traill Taylor.—*Trustees*: Captain Abney and W. S. Bird.—*Treasurer*: J. Stuart.—*Auditors*: A. Mackie and J. S. Rolph.—*Secretary*: H. Harland.—*Committee*: W. M. Ashman (*Chairman*), T. J. Collins (*Deputy Chairman*), W. Bedford, F. H. Berry, T. Bolas, J. J. Briginshaw, E. Clifton, H. M. Hastings, J. Hubert, P. Shea, H. M. Smith, J. Zaehnsdorf.

A communication was then read from Rev. A. Tooth, who said, "I shall be glad to express my sympathy and interest in the Photographers' Benevolent Association. We are very much indebted to the men who have worked so successfully and have brought the art to such perfection, and as an amateur I am much indebted for the pleasure I have derived from their enterprise. I suppose it is the intention of your Association to assist photographers who have fallen into distress. I am writing to say that I shall be very pleased to place a vacancy in my Orphanage at the disposal of your Committee for a boy from eight to ten years of age for whom you may be anxious to provide. The boy would be educated under a master, and be clothed. It would be quite free of expense to his friends. He should remain for one year, and at the end of the year you shall be at liberty to ask for an extension of time."

The proceedings terminated with a hearty vote of thanks to the President.

DERBY PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held on February 8 at Mr. Sykes's Restaurant, 33, Victoria-street.—Mr. J. W. Price in the chair.

Upon the question-box being opened it was found to contain a considerable number of questions, the answering and discussion of which occupied the greater part of the evening.

It was decided to have a lantern exhibition on Tuesday, February 15.

A special meeting was held on February 15 for an exhibition of lantern slides, when a large number were shown by Messrs. C. Merry, J. W. Price, T. Hills, J. Dean, T. Scotton, and H. B. Sykes, and a very instructive and pleasant evening was spent.

Mr. E. J. LOVEJOY (Hon. Secretary) announced that there would be a supplementary exhibition at an early date of some slides by Mr. Wellington, of London.

LEEDS PHOTOGRAPHIC SOCIETY.

THE ordinary meeting of this Society was held on the 3rd instant.—Mr. T. W. Thornton, Vice-President, in the chair.

Mr. THOMAS DAWSON read a paper on *The Art Side of Photography*.

Mr. DAWSON began his paper by stating that photography could be practised with very different objects in view. Addressing his audience as practical photographers, the purpose he had in view that night was to bring before them a few considerations on the influence artistic knowledge and imaginative feeling could exercise upon their practice, and the reflex action it would produce. Though photography was undoubtedly a mechanical art, no certainty of mechanical action in its employment could prevent the operator exercising his mind and will so as to modify the result. In that degree, therefore, it was an interpretative art, and as an interpretative art was peculiarly susceptible to the influence of imagination and of artistic skill. It was conceded at once that, with regard to colour, photography ranked infinitely below the art of painting, but in another respect—effect—its claims were exceedingly high. It was in this latter quality, therefore, that the photographer could make manifest his mental powers. By working in conformity with the limitations of his art, and under the formative influence of his artistic spirit, he might hope to produce works conspicuous for imaginative conception. His choice of subject was all-important; and his selective power in that respect was to be cultivated. How? By the training of his artistic faculties, and, above all, of his imagination. It was by no means necessary for a photographer to qualify for the Associateship of the Royal Academy before being able to produce a picture. The kingdom of art was a wide one, and its avenues of approach were many. Books were to be found whose perusal would set the photographer intent upon self-culture in the direction of art upon the right track. Among such were Howard's *Sketcher's Manual*, Tyrwhitt's *Handbook of Pictorial Art*, Tristram Ellis's *Sketching from Nature*, *The Sketcher*, by the Rev. J. Eagles, H. P. Robinson's two little works, and the writings of Roskin and Hamerton. Conjointly with the perusal of such books as these the study of picture galleries and illustrated books, papers, and magazines should be carried on. Turning to the culture of imagination, Mr. Dawson remarked he could not but be diffident in his remarks upon that topic, inasmuch as upon no less authority than Lord Beaconsfield's, he was addressing one of the most imaginative of audiences. That nobleman had claimed for the English that they are the most imaginative people in the world, because they are the most variously imaginative. Be that as it might, their faculty could not fail to be improved by culture; and to that end nothing was more conducive than the study of our poets, the birds of passion and of mirth, whose immortal pages furnished countless pictures of life and romance. Responding to their stimulating associations, the photographer would find the whole earth teeming with subjects. Tennyson, for instance, was a mine of suggestion for landscape studies. Illustrative quotations from him and other writers

were introduced, and briefly commented upon by the essayist. With regard to the reflex action upon the mind of the photographic artistic student, it was contended the practice of photography would cultivate his artistic faculties, and enable him more readily to perceive latent pictures. The greater scope and power of a photographic lens over the human eye expanded one's mental horizon in like proportion. The photographer gained a comprehensive grasp over landscape scenery, and though extensive views were often far from being the best, a power and mastery over them was not to be despised. One became the better able to appreciate the works of such an artist as Turner, for instance, and no better landscape guide could be found. He was especially of use in respect to one most attractive department of photography—skyscapes. When one thought of the grand visions of ethereal splendour which had shone in the track of the heavens ever since the morning stars sang together for joy, with what gratitude must one regard the art whose recording power would now and in future prevent the utter loss of the like to mankind! In the combination of skies with landscapes, there would be demands not only upon the technical skill of the photographer, but also upon his knowledge of natural effect, and any efforts he might put forth in that direction would be amply rewarded. Having mentioned the advantage of being able to command a variety of lenses in landscape work, Mr. Dawson concluded by briefly referring to the many fine examples of Mr. H. P. Robinson's skill to be seen in the room, as exemplifying some of his remarks, and being suggestive in many other respects.

The CHAIRMAN commented upon the suggestive character of the paper they had just heard, and invited discussion upon its subject.

Mr. FRANK CURZON was glad to have heard the imagination discoursed upon in Leeds, and more especially in connection with such an art as photography. He wished the members would go so far as to select a subject from Shakespeare, and endeavour to body it forth in the spirit of the great dramatist, though in so doing it might be quite possible to have to go outside Leeds for a Hauler or an Ophelia. It was not surprising Mr. Dawson had turned to Tennyson for illustrations, because Tennyson's poetry was literally photographic—a kind of mosaic patchwork. He was afraid the influence of photography on art was not wholly happy, because it seemed likely to make people admire pictures which were simply mechanical. It would be a bad day for art when Alma-Tadema was preferred to Raphael.

Dr. JACOBS concurred in the spirit of the paper which had been read to them that evening, and agreed with the author with respect to the convenience and advantage of having various kinds of lenses at command. When travelling in Switzerland last year he had found the benefit of taking four lenses with him. The amateur had a great advantage over the professional photographer, in being able to invest his subjects with artistic attraction. Nothing had struck him as more pitiable than the fate of the professional man, doomed to photograph such miserable-looking specimens of humanity as daily presented themselves before him—generally incarnations of ugliness.

Mr. BOTHAMLEY thought the subject had been very ably treated. He had several of the works which had been recommended to them; they might, however, indulge in too much reading, and it was desirable to get into practice as soon as possible. He was reminded of the Frenchman's saying about photography being to the scientist a science, to the artist an art, and to the commercialist an industry. A concise chapter on art photography would be found in Captain Abney's work, published by Longmans; the chapter was headed "The Picture," and was, he understood, the joint production of Captain Abney and Mr. H. P. Robinson; but whatever art taste they brought to their work, they would find much remained to be done in development.

The collection of pictures kindly lent by Mr. H. P. Robinson were much admired by the members, being fine examples of artistic photography and illustrative of the introduction of figures into pictures.

Mr. THORNTON, of Manchester, exhibited and explained Thornton's "Jubilee" camera and stand.

The meeting closed with an exhibition of lantern slides specially selected by Mr. Dawson for their artistic qualities.

The next meeting of the Society will be held in the Library of the Philosophical Hall on Thursday evening next, March 3, at eight p.m., when a paper will be read by Mr. S. A. Warburton, on *Gelatino-Bromide Emulsion and Plate Making*, with practical illustrations.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of this Society was held on Wednesday evening, February 16, at the Greyhound Hotel, Dulwich.—Mr. Crossthwaite in the chair.

After the usual business, which was curtailed as much as possible, a number of lantern slides made by members of the Society were exhibited. The lantern was lent and manipulated by Mr. Harold Senior (the Hon. Secretary). Slides made by Messrs. Wolf, Crossthwaite, Ince, and Senior, were shown, most of them being remarkably good. Mr. Wolf's slides were fine specimens of camera reductions on the new chloro-bromide plates. Those by Mr. Ince were worthy of note as being examples of good transparencies produced on Ilford bromide plates.

The next meeting of this Society will take place on Wednesday, March 2.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held at the rooms, 36, George-street, on Thursday, February 10, 1887.—Mr. Allan Garnett, Vice-President, in the chair.

The minutes of the previous meeting were read and passed.

The CHAIRMAN announced that at the Council meeting it had been resolved to rescind the resolution passed at a previous Council meeting, "That the Society do not apply for space at the Royal Jubilee Exhibition," and that, on the motion of Mr. Grestorez, seconded by Mr. Atherton, it was resolved, "That the Society apply for five hundred square feet of space in the Photographic Section of the Exhibition."

This statement met with the manifest approval of the members, and was supported by Messrs. Heywood, Brothers, Ford, Leader Williams, the Chairman (Allan Garnett), Schofield, the Hon. Secretary, and others.

The CHAIRMAN said most of the members who had already applied for space as individual exhibitors had consented to withdraw their application and

incorporate with the Society's exhibits. The Chairman also explained there was no compulsion in the matter, for any member who felt so disposed could exhibit individually if so inclined.

The ballot was taken for Mr. Alan Beckett, who was duly elected a member of the Society.

Mr. S. HERBERT FRY, of Kingston-on-Thames, then read a most interesting communication on *Bromide Paper Printing*, describing the details from beginning to end, both for contact printing and for enlarging purposes, the best developers for certain subjects, &c., with the reasons why; and also touched upon the many difficulties that were likely to occur and how to avoid and correct them. Mr. Fry then proceeded to give a practical demonstration by exposing a sheet of argentotype paper under a negative, using a printing frame made to move, so that six exposures from the one negative could be made on the one slip of paper (which was about twenty-four inches long); the time of exposure was varied in order to demonstrate the difference between over, correct, and under exposure. The development was conducted before the members, and the result was highly satisfactory. Mr. Fry then passed round for acceptance by the members some sample packets of argentotype paper, and exhibited a large and fine collection of finished and framed pictures; and, lastly, he introduced some lenses made by Messrs. J. & R. Beck with "Iris" diaphragms. These, he said, had been made by Messrs. Beck for many years, but they had not pushed the sale of them in this country until recently.

After the usual vote of thanks to Mr. Fry the meeting was adjourned at a late hour.

At the next meeting, March 10, 1887, there will be an exhibition of members' work for the selection of a presentation picture to be given to each member, the picture to be enlarged to about 24x18 and printed in either autotype or platinotype.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this Association was held on the 15th instant.

The minutes of the previous meeting were read and approved, and Messrs. Edward Rodger and D. McCorkindale, M.D., were elected members.

THE PRESIDENT, Mr. P. Falconer, gave an interesting demonstration of the preparation and development of collodion dry plates by the Fothergill process (Hannaford's modification). The plates are sensitised in the bath as for the wet process, then thoroughly washed and flowed with a "preservative" of albumen, silver nitrate, and ammonia, again washed, and finally dried. These plates were originally developed with acid silver and pyro, and were somewhat slower than wet plates. Mr. Falconer has found that when prepared with highly-bromised collodion they can be developed with alkaline pyro, and the very faint image thus produced may be intensified as required with acid silver and pyro. When thus treated the plates are about ten times the rapidity of wet plates. Mr. Falconer used these plates twenty-six years ago, and both in this country and in New Zealand found them reliable. Transparencies of excellent colour were afterwards thrown on the screen, showing the adaptability of the plates for lantern work.

Some fine examples of printing on Eastman's bromide paper by M. Nadar, of Paris, were handed round, and Tyler's patent metallic dark slide was exhibited.

A proposal to enlarge the premises of the Association was favourably entertained, and the Council was empowered to take action in the matter.

A letter from the local Secretary of the coming Convention was laid before the meeting, but the matter was held over for a month, when it will be more evident how the Association can best assist.

Correspondence.

Correspondents should never write on both sides of the paper.

THE DISCOVERY OF THE PHOTOGRAPHIC USE OF EOSINE.

To the Editors.

GENTLEMEN,—I observe that in several letters in recent numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY reference has been made to me as discoverer of the properties of eosine as a colour sensitiser for orthochromatic plates. It may be as well, therefore, to state that I cannot consider myself to have any claim in connection with the practical use of eosine as a colour sensitiser in the preparation of so-called iso or orthochromatic plates.

I believe I was the first to experiment in 1875 with the dye in this direction, and to discover that bromo-iodised or bromised collodion plates—wet or dry—stained with it were very much more sensitive to the green and yellow rays of the solar spectrum than unstained plates. This discovery naturally led me to experiment with the stained collodion plates in photographing coloured objects and landscapes, but I failed to produce the desired results. Other important work prevented my following up the research, either with collodion or gelatine plates, and it was left for others to work out the discovery in these directions and turn it to really practical account.

From the information I have at hand, I believe the first to practically apply eosine in collodion plates were the brothers Ducos du Hauron, and in gelatine work Messrs. Atout Tailfer & Clayton, whose plates have been in the market for some years, and successfully fulfil all requirements. These gentlemen are, I think, fairly entitled to all credit and substantial benefit in the way of patents they can legally claim.—I am, yours, &c.,

J. WATERHOUSE, Lieut.-Colonel, B.S.C.
Survey of India Office, Calcutta, February 1, 1887.

ORTHOCHROMATIC PHOTOGRAPHY.—ETHOXO LIGHT.

To the Editors.

GENTLEMEN,—In your issue of January 28, page 51, I find the following: "The employment of eosine and chlorophyl, also colour screens, in connection with photographing colours, was practised more than ten years ago." Now this is literally true, but as such an unqualified statement might appear to some to reflect upon my claims to original discovery in this direction, permit me to state the following additional facts: First. Chlorophyl was never used with wet collodion emulsion plates and a yellow colour screen until I discovered that in that way it was possible to photograph all colours in approximately the true proportion of their brightness. Second. Previous to my discovery no photograph was made, and it was not known that any photograph could be made, in which all colours were reproduced in correct colour tone. Third. Chlorophyl and eosine were never used together (in the same sensitive film) until I discovered and published the advantages of such a combination.

Also, on page 52, Mr. Brooks, speaking of that form of ether saturator invented by myself, says: "These saturators . . . I do not think sufficient to last for an evening," &c. I am pleased to know that Mr. Brooks can suggest no other objection to this invention, because it is a known fact that a good many professional exhibitors in this country are using it, and giving exhibitions of two hours' duration, with a most brilliant light, without experiencing any such difficulty. This light has been used in illustrating most of the Franklin Institute lectures for several months past, and a saturator one-third smaller than the smallest that is sold here has been run two hours, producing a light fully equal to that previously obtained with the mixed gases. Safety jets were not used, yet the flame has never once "snapped" in the jet. It would appear that the imitation saturators sold in England are not properly constructed. It seems to me unfortunate that any one should be led to continue the use of the dangerous Broughton saturator because they are deceived as to the success of the only ether saturator that any dealer in this country dares to recommend.—I am, yours, &c.,

FRED. E. IVES.

2609, Jessup-street, Philadelphia, February 11, 1887.

GENTLEMEN,—Referring to Messrs. Edwards' letter in your last issue, I would point out that in my paper at the Conference I said, "I am quite sure that I am not alone in thinking that had Messrs. Dixon not issued their successful plates we would never have heard so much of the Tailfer patent, nor would the gentleman have bought the English interest in it."

Now the only statement which the foregoing contains is in these words, "I am quite sure I am not alone in thinking;" and if Messrs. Edwards had been present they would have been thoroughly convinced of its truth by the way in which it was received.

If, however, Messrs. B. J. Edwards & Co. want a statement, I can state, with all truth, that up to the time of writing no transfer of the patent has been recognised nor exists in the Patent Office.

They next object to my assertion as to the orthochromatic effect of their plates without a screen. Now, my assertion included all orthochromatic plates, except collodio-bromide. I did not specially single out Edwards's plates. And I have seen no reason why I should withdraw that assertion.

My experiments were carefully carried out in order to find out the full capabilities of orthochromatic plates with and without the coloured screen.

In conclusion, I would say that most people find a difference between practical results and mere results for advertisement.—I am, yours, &c.,

WM. H. HYSLOP.

WHAT CONSTITUTES DISTORTION IN PHOTOGRAPHS?

To the Editors.

GENTLEMEN,—I could not help thinking, when at the last meeting of the North London Photographic Society, that, although the subject must be well known by experts, there is a good deal of misunderstanding as to what constitutes distortion in a photograph. Some pictures are very unpleasant and unsatisfactory when hung up on a wall and seen from a considerable distance, but if looked at from the proper point of sight, every part assumes, as if by magic, its proper form and position, and all distortion disappears—the reason being that there is only one point from which a correctly drawn perspective view can be seen correctly; and I have seen on old engravings a cross about the middle of the picture with a scroll stating that at so many inches perpendicularly above that mark the proper view will be seen. The camera, with a proper lens, must give true perspective, and the picture taken with it must be true if looked at properly, namely, at the exact distance of the focal length of the lens. Unfortunately, that is sometimes much less than is required by the eye, and in many cases only people who are shortsighted, as myself, can see the picture in anything like its true proportions. It would be a great advantage to the apparent correctness of architectural photographs if they could be taken with a lens of not less than twelve inches focal length, and even then they should be looked at, for correct effect, with one eye directly opposite the centre. Any indication of the true horizon shows the proper height at which the eye should be placed.

I was struck the other day with the apparently much distorted appearance of the Clock Tower in a published view of the Houses of Parliament;

but when I looked at it with my short-focus eye, from a proper position, the Tower assumed its proper form and was very beautiful.—I am, yours, &c.,

GEORGE H. SLOTT.

413, East India Dock-road, February 19, 1887.

ON PRINTING-IN CLOUDS IN PLATINOTYPE.

To the EDITORS.

GENTLEMEN,—In a recent issue of your JOURNAL "Monitor" touches upon the "printing-in" of skies upon platinotype prints.

Now, while not intending to write oracularly upon the subject, I think (*pace* "disinterested amateurs!") I may lay claim to know something about the subject, seeing that I am commonly considered a fairly successful platinotype printer. This being so, and as "Monitor" writes that the subject "will bear ventilation," perhaps a few suggestions from me may be acceptable to some of your readers.

It will serve to show that the difficulties to be encountered cannot be very great if I say that my printing occupies perhaps as much as a week, sometimes less, in the whole year; hence it cannot be said that my "hand is kept in" by constant practice. I print very much less than the majority of amateurs.

Another point I would mention is that while I have relied solely upon judgment, as when exposing for a negative, Mr. Willis has a plan by which he hits off the exposures to a nicety; it is an "actinometer" method, the details of which I do not quite remember. I shall, therefore, confine myself to my very elementary method. But, in addition to correct exposure, there is the question of so shaping and graduating the clouds that the effect may be artistic.

To proceed:—I first provide a print "in the rough." With this I select a sky from a series of cloud negatives. If I wish to make several prints alike, while the print is held "against the light" in a suitable position on the negative, small strips of gummed paper—perhaps two at right angles—are fixed on the *back* of the negative to mark the points where the hard edge of the rebate mark shows upon the rough print (and as it will also show upon the undeveloped print). This hard edge is visible on any print (it being the margin of the picture) when held behind the cloud negative, the whole being viewed by transmitted light. Hence, any subsequent print can be readily fitted in the same position to the fraction of an inch, as was the first print with which the selection was made. I hope I am clear so far.

As regards printing frame, I would not use any ordinary ones except those with glass fronts, and of a size, perhaps, whole-plate or 10×8 for half-plate prints. I have nothing special in this way, though in various ways something good might be turned out.

Having fitted the undeveloped print in right position on the cloud negative, both are carefully placed on the glass of the larger printing frame, and the whole secured as usual, the rubber pad on no account being omitted. A piece of brown paper doubled, or other opaque body—as a piece of coloured felt—is placed over the face of the frame and the whole is carried into the open air. Now come the questions how long to expose, and, secondly, what parts are to receive the impact of light.

To dispose of the first question a little previous knowledge is required of the printing qualities of the negative, or of *others* somewhat like it in intensity or in density. This faculty of judging is quickly cultivated, as is that of making exposure of plates in the camera; but, of course, various actinometer methods may be employed by those not possessed of sufficiently close observation.

Having decided this point, the frame is conveniently placed, the rough print in front beyond the frame, and the watch by the side. It may serve as a weight to prevent the print being blown away. The opaque material is then drawn off the sky portion, and as the sky-line is generally by no means a straight line, a cloth, which may be opaque or not as preferred, is then roughly adjusted to cover the landscape and parts of trees, &c., to the sky-line. Sometimes a piece of brown paper, roughly torn to shape, may turn out useful in addition to the cloth; indeed, I prefer not to depend entirely upon the cloth.

Well, the adjustment to the lines of the rough landscape is made as well as the eye suggests, and to this end the white gummed paper strips before mentioned will also be found useful. And now it is a little difficult to say *what* should be done. One thing is certain, use your brains and artistic faculties; but, of course, this applies equally to silver printing. And I may add, bring any amount of intelligence to bear, but, in a sense, do not be too careful. Absolutely accurate adjustments are worse than useless, even if possible. In any case the cloth must be rearranged in various forms during the printing, and the watch is an aid to doing this judiciously—so much to this part and so much to that part; by this means, also, the artistic quality of the sky negative may be practically enhanced.

It is well to provide a few small weights to hold the masks and cloth in position, but the cloth should rarely be held down close to the glass (unless the glass is very thick) by such means; on the contrary the cloth should be in folds, presenting a rounded edge.

When the exposure is judged sufficient, nothing as a rule remains but to develop it; only storm clouds are visible to the average eye, so that clouds which are visible are usually over printed—at least for a *hot bath* of potassic oxalate.

I find printing as easy as I did that with albumenised silver paper.

Some of the prints in exhibitions are the *only ones* attempted of the subject.

It remains to be said that as the sky-line of an undeveloped print is commonly visible, the adjustment to the cloud negative may be made without having recourse to the "rough" print, and if the sky-line should not be visible, then the lines of the rebate marks are useful guides, and in some instances I have found that little holes, pierced by one of the legs of a pair of compasses in the margin of the print where the sky-line "runs out" on both sides, useful for purposes of adjustment. The points at which to pierce these are discovered by setting the compasses against the sides of the landscape negative or of a print from it, the lower leg being placed on the "rebate line," and the upper, of course, where the sky-line runs out. These little holes form luminous points by transmitted light. I say this forms a plan by which printing-in skies in platinotype is as easy as other photographic operations. I know that many do not print in skies, simply because they have never tried to do so. There is generally nothing wonderful, nor "hankey-pankey," in the methods of practical men, but they just *try*.

If your readers should take an interest in the subject, I may be able to give some details of Mr. Willis's plan; but I make no promise in that connection.

It is advisable that the cloud negatives be very clean and not very dense. To obtain the right kind use about three or four grains of pyro and one minim of ammonia and do not be in a hurry. If sulpho-pyrogallol be used the negatives are much like wet-plate ones, and those who print in clouds are aware how the latter facilitate the operation.

If conveniences exist it is an excellent plan to make the cloud negatives on larger plates than have been used for the landscapes. The operation will be found rather easier, and a stock of negatives will certainly provide for a larger number of pictures. Seeing, however, that clouds are often required at one side of a picture, the other side being occupied by more or less solid objects, it follows that the print may project on one side *beyond* the limits of the cloud negative. It will generally be found a sufficient and satisfactory plan to "sun down" the projecting part (if there are lights through the trees) after the clouds have been printed.

There is one little dodge I sometimes bring into use in development. It is well known—or ought to be well known—to workers in platinotype that it is the deepest parts of the print which suffer most, in a technical sense, from curtailed development; it therefore follows that such parts as clouds will not suffer much in *quality*, but only in *depth*, by earlier removal from the oxalate bath than that of the rest of the print. Sometimes, therefore, I lay the cloud side, or corner, down *last* and then pick it up *first*; or if I do not raise the part entirely I "take a peep" at it. But do not let me be misunderstood; I do not hold with "taking peeps" at the *shadow* part of prints, because the result is a "cool" development, and I hope my readers are fully conversant with the various ways in which "cool development" spoils the "blacks" and introduces defects of various kinds.

On the subject of hot and cool baths I may have occasion to write later on, if the Editors think the subject of interest. In the meantime, readers cannot do better, as a rule, than to work with baths not lower than 146° Fahr. for "A" paper, and not lower than 155° Fahr. for "B" and "C" papers.

On the subject of the alleged accelerating effect of common salt on a dry plate, I think it is *possible* that the formation of magnesium hydrate may have to do with it. Several years ago I found that *sulphate of magnesium*, used in the alkaline (ammonia) developer, resulted in somewhat similar manner to calcium hydrate—a very black image. This I doubted not resulted from formation of magnesian hydrate. But, of course, that can only apply to the ammonia and not to the iron developer.—I am, yours, &c.,

HERBERT B. BERKELEY.

February 5, 1887.

THE OXYHYDROGEN JET.

To the EDITORS.

GENTLEMEN,—I hope that Mr. Wright does not imagine that I claim any connection with, or credit for, any part of the fine oxyhydrogen jet I lately got from Messrs. Newton. So far as the illumination or lime turning arrangement is concerned, I had nothing to do with the angle nor the shape of the nozzle and the nipple, nor with the mixing chamber. Having myself made experiments upon the angle of impact (in course of which experiments I broke one nipple and frightened another), I saw at once the advantage of the nozzle shown to me by Mr. Newton, and bought the jet. I am well aware, and Mr. Newton frankly stated, that Mr. Wright had been instrumental in fixing the angle, calibre, and shape of the nozzle; my instructions to Mr. Newton were to adapt my "cut-off" arrangement to a jet such as he showed me. I am pleased and flattered by Mr. Wright's approval of the only part of the jet that I have any claim for suggesting.

The quick pitch of the lime pin is due, I am told, to Mr. Place, of Birmingham, and a great advantage I find it.

Mr. Wright is probably correct when he says that the straighter jet nozzle will "pit" the lime with great pressure, but I fancy the pit will be in a different direction as regards its axis, and less dangerous for the condenser. I must say that as yet, with my usual pressure of one hundredweight on seven feet bags, I have not found a lime "pitted"

worn away it has been undoubtedly, but not into a "pit" with steep sides, like a "pit" made by a jet impinging more "straight on."

Re Mr. Berkeley.—Regarding Mr. H. B. Berkeley's laconic comment on my letter of ancient date, I can only say that when I start a paper factory, or when the Esk comes down in a flood of ink, I may try to reply at full length to his pleasantries. One moral I draw from his letter, that is, that I must take from Mr. Berkeley a course of lessons in negative making.—I am, yours, &c.,

ANDREW PRINOLE.

Craigcleugh, February 21, 1887.

FOG VERSUS ACCELERATOR.

To the Editors.

GENTLEMEN,—“Monitor” has quite misunderstood my motive in sending the two plates to the London and Provincial Photographic Association. I was not advancing any new theory, merely anxious to corroborate a fact that plates are affected by the paper used to separate the films in packing; my experience was that instead of producing fog the paper I used had an accelerating effect. This I think was most conclusively proved, as the paper was not nearly as large as the plate, and where the paper was in contact there was a most distinct effect. The object of the second plate was merely to show that the plates before repacking were perfect.

Where paper is used for separating the films the whole of the plate is covered, and no marks are observed on the finished negative. Whilst on this subject I may as well repeat what I stated in my American notes. I had my stock of plates packed with *papier Joseph*, which I used in repacking, and I had not an instance of a defect although twelve months elapsed from the making and developing of the plates, which were often used under very varying conditions of heat, damp, and intense cold.—I am, yours, &c.,

F. YORK.

February 18, 1887.

A SUGGESTION.

To the Editors.

GENTLEMEN,—Of course there is no reason why some means may not ultimately be found by which the keeping qualities of “Ortho” or “Isobromatic” plates may be greatly improved. Under present conditions it is impossible that their sale, and consequently use, can be very extensive.

Why does not Mr. Edwards supply the necessary solutions made up in bottles, sufficient, say, to bathe one dozen plates? If he only sold so much solution on condition that so many dozen plates were taken as well, he would lose nothing and speedily increase the number of his customers.—I am, yours, &c.,

H. A. LEWIS.

Binsted, Arundel, February 17, 1887.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

William Usherwood, 32, High-street, Dorking.—“Derby Race,” 1886.
Alfred Rogers, Mount Pleasant, Bacup.—“Photograph of Bacup Handbell Players.”
Alfred Seaman, Corporation-street, Chesterfield.—“Eight Photographs of ‘The Ceremony of Reading the Charter of Incorporation of the Borough of Ilkston.’”

AN AMATEUR (Weybridge).—See answer given last week.

C. STEPHENS.—We shall be glad to see you when you are next in London.

ROCK.—Paint your rocks with burnt umber mixed with turpentine and linseed oil, using the former in excess.

H. J. S.—Apply to the manufacturers of machinery for making paper-hangings. They will probably supply what you require.

Z. Y. X.—The bottle was in splinters when received, and the contents doubtless distributed among the letters in the mail bag.

I. J. S. C.—You will find plenty of formulæ in the ALMANACS for the last few years. Any of these will serve your purpose if you give the emulsion a generous cooking.

A. FREEMAN inquires: “What would you recommend me to use as sizing to prepare silver prints for taking oil colours?”—Give it a thin coating of gelatine and gum arabic.

GREENHORNE.—1. $\frac{1}{2}$ means that the aperture in the diaphragm is one-twelfth the focus of the lens. 2. If the lantern lenses are portrait combinations, they may be employed in photography just as they are; but, if single, then must a diaphragm be adapted for them. Send us a drawing.

HY. E. WHITE (whom we welcome back to photography) desires information concerning Mr. Coventry's machine for coating plates, partly described in last ALMANAC, where it can be obtained, and whether it is practically a success. We invite a reply from such of our readers as are in a position to answer.

E. DODGE.—The plan of “restoring” photographs referred to is that of treating them with a dilute solution of bichloride of mercury. The effect of this is that the yellowness of the print is removed; but it must be understood that none of the detail which has disappeared will be restored by this treatment.

P. O. MALLIN says an illustrated paper has copied one of his photographs—a copyright one—without asking his permission or acknowledging him as the photographer. He asks if he has any remedy.—If the photograph pirated is a copyright one our correspondent certainly has a remedy under the Copyright Act, and he should take proceedings at once.

BROMIDE.—The precipitation was no doubt caused by the emulsion not being sufficiently shaken between the additions of the silver solution. Emulsify with a slight excess of silver. You cannot do better than follow the directions given by Mr. Wellington a few weeks ago. The emulsion by his formula is specially suited for the production of lantern transparencies of the tone you desire.

R. C. Y. complains that in his attempts at stannotype printing he cannot get the gelatine relief to develop, although, he says, the water used in some instances was nearly boiling. He asks the cause.—The cause is that the gelatine has become insoluble, either from an unsuitable kind of gelatine for the purpose being employed or from its being dried too slowly. Probably the insolubility is due to the latter cause.

C. NASH has some engravings to copy of large size, and asks which is the better plan—to take small negatives with a portrait lens and then enlarge them, or to take them the full size with a long-focus rapid symmetrical he has, adding that the former plan would be the more convenient, as the work has to be done away from home.—By far the better plan will be to take the negatives the full size direct with the symmetrical lens.

LUX says: “Will you kindly say in next issue in reply to queries: 1. Is Alpha paper a film of bromide or chloride of silver, or a combination?— 2. Why should it require a gold toning bath when bromide prints do not?— 3. Why should a longer exposure and weaker developer produce the red tones, when a short exposure and strong developer yield black tones, as in bromide films?”—In reply: 1. The formula is a trade secret.—2. To obtain the warm tone, toning with gold is necessary. If black tones are preferred, bromide paper should be used in preference.—3. It is a fact that it does so, and with that we must be content.

W. C. B. writes: “Will you kindly enlighten me a little as to the following small worry: is there any recognised rule as to the exhibition, in outside show-cases, of portraits taken in the ordinary course of business? Some people object to what they term being ‘stuck up’ in a show case; but a photographer cannot be expected to be always changing his specimens merely to suit whims and fancies.”—The only recognised rule amongst respectable photographers is never to exhibit any sitter's portrait, taken in the ordinary course of business, without first obtaining permission. It is as unwise as it is impolitic ever to do such a thing.

J. COCKBURN writes: “In photo-micrography, using a camera, how can I tell the exact amplification? Given that the magnifying power of objective and ocular is known, and also the distance from ocular to focussing screen of camera. I am engaged in photographing bacilli, and wish to be able to calculate the number of diameters of enlargement, without using either stage or eye-piece micrometers. I hope to send shortly, for your inspection, some photo-micrographs of the structure of the eye, which I have done by the method I use, and which you printed about two years ago.”—We have among our readers several photo-micrographic experts from whom we should be glad to hear in reference to this matter.

HALLAM writes as follows: “I have some Daguerreotypes of departed friends which have faded, and I have been told that they can be restored; will you kindly tell me how? If they cannot be restored, please say the best plan for an amateur to copy them.”—Faded, or rather tarnished, Daguerreotypes are cleaned in the following manner:—Take the picture out of its frame or case and carefully remove the paper by which the edges were secured, then immerse it in a solution of cyanide of potassium—ten grains to the ounce—until the tarnish has disappeared; then remove and copiously wash under the tap, and finally rinse with distilled water. The plate must then be dried over a spirit lamp, taking care that the heat is applied first at the corner opposite the one from which the water was drained, and then gradually downward over the plate. Unless this precaution be taken wavy marks will be produced in the drying.

PHOTOGRAPHIC CLUB, Anderton's Hotel, Fleet-street, E.C.—The subject for discussion at the next meeting of this Club, Wednesday, March 2, 1887, will be on *Cameras*.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.—The next meeting will be held in Myddelton Hall, Upper-street, on Tuesday next, March 1, at eight p.m., when the adjourned discussion on lenses will be resumed, followed by a lantern exhibition. All are invited.

FROM Dr. Liesegang we have received a sample packet of his Aristotype paper which we have tried with complete success. The paper is prepared with a collodio-chloride of silver emulsion, and the toning is effected by the sulpho-cyanide bath.

We are sorry to learn of the sudden death of Mr. Charles Harris, which took place at his residence near Manchester on Sunday last. He was a member of the Manchester and Glossop Dale Photographic Societies, and during his travels abroad had made a large collection of photographs.

COLOURS FOR TRANSPARENCIES.—We have received from Messrs. Reeves & Sons, London, a very compact box containing a complete outfit for colouring lantern transparencies. It contains twelve tubes of pigments, with brushes, and everything that is required in transparency painting. It is sold at a very cheap rate.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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FIXING CRAYON PRINTS.

WHEN photographs are finished by crayons or chalk they are very liable to become damaged or destroyed by the slightest abrasion from contact with any other print with which they may be placed in contact, or even by the paper which has been placed over them by way of protection.

Now that the production of enlargements is carried on to a greater extent than formerly, photographers may not only be held excused, but are to be commended, for striving to improve their work, or at any rate to remove any imperfections by the judicious application of chalk or crayons. It is surprising what improvements may be effected by a few minutes' work with a charcoal pencil, a crayon stump, and a nicely pointed ink eraser.

It does not require a very high degree of skill, provided one is imbued with taste, to apply not only black chalks but also coloured crayons to an enlargement, if one does not at first aim too highly. We know, however, from the correspondence we receive on the subject, that many of our readers are possessed of artistic skill quite sufficient to prevent them from making any serious mistake as regards the art aspect of the matter.

Crayons or pastels are so easily procurable at such very moderate prices, that we would recommend a complete set of the different colours being kept by all who do enlarging, either as amateurs or professionals. The bases of the better sort are formed, *inter alia*, of finely ground chalk, pipeclay, plaster of Paris, oxide of bismuth, kaolin, and magnesia, and the colours are composed of an almost infinite variety of earths and metallic salts, such as those of copper, iron, cobalt, and others.

Photographs taken with a special view to being finished in crayons should not be on albumenised paper, but on a surface on which there is a tooth. The paper now employed for enlarging by the bromide process lends itself admirably to being worked on by crayons, and no preparation is required to make the pigments bite. This, at any rate, is our experience. It would be rather out of place here to describe the various methods that may be resorted to in order to blend one colour with another by the agency of the leather or paper stump, which stumps are articles of commerce, but we may observe that it must be done with judgment, in order that the tints be not rendered flat or opaque.

But assuming that the picture has been finished, we now come to the practical inquiry as to how the pigments, whether black or polychrome, are to be fixed.

There are numerous varnishes or solutions which, if flowed over the surface, would undoubtedly fix the pigments, but

would make them flow into each other, producing a veritable smudge and cause the picture to lose all its effect. What has to be aimed at is the application of some means by which each individual touch will retain its identity without, so to speak, obtruding itself on the domains of its neighbour.

This is best done by laying the finished print face down and sponging its back with a fixing liquid prepared by the following means:—Place in five ounces of rather weak acetic acid an ounce and a half of gelatine, and, after allowing a few minutes to soak, add a quart of hot water. Place this on the hob and allow to remain there until perfect solution of the gelatine has taken place, which will soon be effected by occasional stirring. When it has become cold it will be sufficiently fluid to admit of being filtered, which may be done through a piece of cambric, and then add an equal bulk of spirits of wine. After shaking well up the solution is complete.

This when applied to the back of the print speedily penetrates the paper, and entangles, so to speak, the atoms composing the pigment. This is rendered apparent by the colours acquiring a peculiar moist shining appearance. The picture is now allowed to dry, when the crayons will be found to be perfectly fixed. As there may be a slight lowering of some of the pigments it may be necessary to go over the picture again when dry, merely touching a point here or there.

The method above described is one which is adopted by most artists, but some prefer fixing their colours by immersing the prints in water saturated with alum, in which has been dissolved gelatine or isinglass in the proportion of an ounce of the gelatine to a pint of water, to which is afterwards added six times its bulk of spirits of wine. Methylated spirits answer quite well. This solution should be made slightly warm previous to immersing the prints.

Another solution used by artists consists in dissolving half an ounce of gelatine in three pints of water, and after being heated to the boiling point, dissolving therein half an ounce of white soap. Allow to boil for fifteen minutes and then add a quarter of an ounce of powdered alum. When nearly cold filter through muslin, and when quite cold add half a pint of spirits of wine.

ON BUSINESS MATTERS.

How is it that so many old-established portrait photographers, at the present time, are complaining of the lack of business, while others, comparatively newly established, are apparently in a flourishing condition? A commercial man remarked to us the other day that profitable portrait businesses appeared to be

divided into two classes—the very high priced and the very low priced. Those establishments with medium prices—say, ten shillings per dozen for *cartes*, for example—were, he said, those which are now suffering most from depression of trade.

Many of those who are now lamenting over the exceedingly low prices they now obtain for their productions have in many instances, we venture to say, only themselves to blame. Here is a case in point that will serve to illustrate several others which have come under our observation. In a medium-size provincial town was a well-established photographer, whom we shall designate Mr. A. His establishment was situated in the principal street. He produced excellent work, obtained high prices, and had the leading business in the town and surrounding district, which, by the way, included a large number of the nobility. There were other photographers in the town, but they were in minor streets, their prices were low, and their work inferior. Hence Mr. A. had the whole of the better class of business in his hands, without opposition, for many years. Eventually another artist, of not less ability, opened a studio in the same street, and fitted up his establishment somewhat expensively and with great taste. He also exhibited pictures of a larger size, and of a more artistic character, than had hitherto been produced in the neighbourhood. His prices were fixed but a trifle below those of Mr. A. By business tact, coupled with the production of work in keeping with the appearance of his place, he soon secured a good trade, although, photographically, his work was in no way superior to the other man's. Mr. A., on finding his trade being transferred to the new comer, came to the conclusion that the slightly lower prices were the cause, and forthwith, most unwisely, reduced his charges to considerably below those of his competitor.

That the reason for the loss of trade was not due to the lower price was easy to see by a visit to the two establishments. In the new one everything was bright and fresh and in good taste. The furniture and fittings of the reception and dressing rooms were of the most modern type. The specimens were all recently taken, the sitters being attired in the latest fashion of the period. The studio and its appointments were in keeping with the rest of the premises, everything being clean and tidy, whereas, in the old establishment, all the furniture was conspicuously the worse for wear, and the carpets were faded and partly threadbare. In the studio the backgrounds and accessories were the same that had done duty for many years and were quite out of date, while the curtains, like the carpet, had become faded and dirty-looking. In a word, the whole place had a dingy and forlorn appearance. Under these conditions it was not surprising that the reduction in the prices made no material improvement in the trade, as the original high-class business was never recovered. This particular business has changed hands several times and fresh photographers have set up in the town, yet Mr. B. is the leading man and still maintains his original prices. But, it must be mentioned, he is continually renewing his specimens as they become out of date, changing his backgrounds and accessories as well as replacing everything as it becomes shabby.

On mentioning this particular instance to a commercial traveller for one of the large wholesale houses, he assured us that, within his experience, he could cite scores of cases where old businesses had been lost and prices ruined in a similar manner, adding that it is a very common thing, when a photographer finds his trade going to another, to reduce his prices, instead of endeavouring to improve the character of his work or modernising his establishment so as to keep pace with the

times. When one photographer reduces his prices, others too often follow suit, and this leads to still further reductions, which ends in the ruinously low price, for really good work, so frequently met with in many country towns.

What has been said with reference to photography in provincial towns applies equally as well to the Metropolis. We have in our mind many old-established studios in London where the same thing has prevailed, and good businesses have been lost, and prices brought down, through lack of business tact and not advancing with the times. There is, we think, no question that in those establishments where the highest prices are obtained that the public are induced to pay them, in a great measure, through the appearance of the place itself. The reception and retiring rooms of these establishments are elegantly furnished, the appointments being of the most expensive character, while the specimens exhibited are always of modern production, so that the latest fashion in costume is secured, and this is an important point with lady sitters. The studios are also in keeping with the rest of the place, being furnished with accessories and backgrounds of the highest artistic order and most modern type. The whole place, in fact, by its appearance, inspires confidence that orders will be executed in keeping with the surroundings.

In some West-end houses we could mention, with old and well-known names attached to them, we find just the reverse. The carpets of the rooms are threadbare, the curtains faded, and the furniture devoid of polish. The coloured and finished specimens are the same that were there a dozen years or more ago, and are, of course, in all manner of old-fashioned costumes. There may be a few modern ones, but they appear to be lost amongst the larger number of ancient ones. The studios are, for the most part, crowded with accessories long since out of date and, consequently, quite unusable in modern pictures, while the blinds and draperies are either stained or faded. In fact, the place has a depressing effect upon sitters, and is apt to lead them to surmise that their portraits will partake of the antiquated appearance of the establishment generally. Consequently the extent of the orders given are often far more limited than they would have been in an establishment such as that to which we have previously alluded.

Much more might be written on this topic, but sufficient has been said to indicate why some businesses have declined while others are prosperous.

LAST week, when referring to negatives whose corners were cracked, we described an old laboratory expedient for leading a crack in any desired direction, a method which is often very useful for converting broken vessels of one kind into useful utensils of another description. Thus, we have seen a cracked "Winchester quart" cut into two, so that the lower part became a useful jar, while the upper, the neck part, was utilised as a funnel. It will sometimes be found in dividing glass in this way that the crack will decline to move, and the operation seem at a standstill; if, however, a drop of water be placed on the spot, or even it be touched with a finger moistened by the tongue, the consequent quick reduction of temperature will usually start the crack afresh.

THERE are occasions when it is wished to divide an uninjured glass vessel into two parts, and a very neat way of doing this has recently been published. Our readers are doubtless familiar with the older method by a piece of twine dipped in alcohol and set on fire after being tied round the selected spot, immediate affusion with cold water sufficing to cause the separation. Again, too, heating by the friction of a piece of cord kept in the desired place by two other wrappings of cord separated so as to form an annular space will, with cold water

again applied, cause the glass to crack at the required line of separation. Both of these plans, and many similar ones, are of very problematical utility in most cases; but the one we allude to seems to possess all the elements of practicability. As described in the *Chemical Society's Journal*, it runs: "A scratch is made with a file, at both sides of this pads of wet blotting-paper are wrapped round the object, leaving a space of a few millimetres between them. The flame of a Bunsen or gas blowpipe is applied to this space, when the crack will be carried round from the scratch midway between the two pads."

EVERY one knows how difficult it is to cause a label to adhere with any tenacity to metal; hence a reliable recipe for a paste or glue alike useful for metal, glass, or wood, will be useful to our readers. The following formula was given at a meeting of the American Pharmaceutical Association as being useful for the production of a paste answering all these requirements:—Gum tragacanth, one ounce; gum acacia, four ounces; water, one pint. Dissolve, strain, and add, Thymol, fourteen grains, suspended in glycerine, four ounces; finally add water to make two pints. Mr. Eliel, who gave this formula, says of the mixture, that "it will keep aweet indefinitely, the thymol preventing fermentation; it will separate on standing, but a single shake will mix it sufficiently for use."

In laboratories and dark rooms liable to fluctuations of temperature, one of the greatest annoyances connected with stock bottles is the liability of the labels to become loosened or detached through the continued action of moisture, deposited especially by a humid atmosphere following a cold day; so that, whenever a bottle with a label so loosened is, in the interests of cleanliness, subjected to an occasional polishing with the towel, it will often be found labelless. But all photographers have at hand every necessary for securing the label and adding to its appearance. It will quite suffice to brush over the label, when once attached, some of the usual mounting material of the establishment—be it paste, gum, or glue—and then, when it is thoroughly dry, to give the label a coat or two of photographic varnish, or a single coat of shellac cement if that be available. The label then is proof against everything likely to come into contact with it, and may, without injury, be washed under the tap as often as is necessary. It offers a striking contrast to the usual dirty grey of the label of an often-used stock bottle.

The shellac cement above mentioned should be kept in every photographer's establishment, no matter of how modest dimensions. As a waterproof cement it is admirable, and will repair small objects with greater certainty than ordinary glue, while, when thin enough to serve as a varnish, it is invaluable for an immense variety of purposes—from dark slides and printing frames downwards.

This cement is by the experts usually considered to be best made by dissolving the shellac in wood naphtha rather than alcohol, but our own experience has been that one solvent was as good as the other, and, nowadays, methylated spirit may be far more easily purchased than wood naphtha.

At the Royal Society's meeting, on January 27, Mr. B. J. Burch described a singular arrangement of lenses for what he termed a "Perspective microscope" that he had devised. While endeavouring to devise means whereby the various planes of an object should be visible under the microscope without the adjustment of focus to each, he discovered that "when two lenses are separated by a distance equal to the sum of their focal lengths the optical conditions are such that the magnitude of the image bears a constant ratio to that of the object no matter where, upon the optic axis, it is situated—the ratio being the focal lengths of the two lenses; that a given displacement of the object causes a displacement of the image in the same direction, but in the square of the ratio. Further, that a picture drawn with the camera lucida under these conditions has the perspective of an object magnified in the square of the ratio when it is brought within the proper distance of the eye. The field of view of the perspective

microscope is small, but may be increased by using more than two lenses; but the writer believed that with glasses of wide angle, specially constructed, a high power with sufficiently large field might be obtained." The possibility of constructing an optical arrangement that should give the same size image no matter how far away the object was is too remarkable to pass without notice; we need not say, except for possible photo-micrographic work, it could have no real field of usefulness in photography.

BICHIROMATED GELATINE EMULSION PAPER.

It is a little over two years since I first described in these columns a method for making transparencies or reproducing negatives based upon the employment of gelatino-bromide or chloride paper, treated with potassium bichromate and used after the manner of carbon tissue. Little practical utility has, however, resulted from the process, in all probability because, as I pointed out at the time, the presence of ordinary or chrome alum in most of the commercial samples of paper caused them to become spontaneously insoluble after contact with the chromium salt.

I have personally frequently availed myself of the advantages of this method for special objects, preparing my own paper for the purpose, an operation, as I previously pointed out, much simpler and easier than is the case with glass plates, if only a suitable paper be obtained at the outset. Quite recently, however, I have met with a commercial sample of gelatino-chloride paper (Obernetter's) which answers admirably, all the requirements having a perfectly soluble layer of sensitive material of good body, and only requiring immersion in a two to five per cent. solution of potassium bichromate and subsequent drying to fit it for use. Here, then, is a chance for those who cannot or do not care to prepare this tissue or emulsion to try its value for the various purposes to which it is adapted.

So far from being merely an experimental curiosity as was suggested by one correspondent, or a "roundabout way of performing inferior work" as another was good enough to say, it produces better results in some departments than can be obtained in any other manner. Take, for instance, the reproduction of negatives, especially in such cases as necessitate some modification of the character of the original. Here there is of course the double operation of making first a transparency, and from that again the duplicate negative; and each operation of course affords the double facilities which the development of the bichromated gelatine film offers in the first place, and subsequently the reduction of the haloid retained in the insoluble image. Add to this that where extraordinary density is required, as for photo-mechanical processes, the doubly developed image is still further amenable to intensification both by staining the gelatine as well as by piling on more silver by the ordinary methods of silver intensification, it results that with a film very much thinner than one is accustomed to in ordinary carbon tissue, images of great force can be obtained, though where the utmost density is required, with a minimum of trouble, it is better to commence with a film possessing some substance.

For some descriptions of transparencies the process is often useful, and a very great variety of tones may be obtained of pleasing character to suit different subjects either on opal or plain glass, though this application does not offer the same practical utility as the preceding, since it is only possible to utilise it for contact printing from negatives of the same size as the desired positive. For lantern slides from specially taken negatives—that is from negatives which require no reduction—it gives very fine results, resembling Woodbury slides in transparency of the shadows, while the colour can be varied to almost any extent.

The toning of the metallic image according to the haloid employed and the method by which it may have been reduced, can be effected either by the ordinary gold or other substitution method, or by staining the gelatine film, which not only holds the image but is present in precisely the same varying thicknesses as the quantities of metal forming the different gradations. Thus a cold silver image may be rendered of a warmer and more pleasing tint by staining the gelatine red or purple, or a foxy red or brown may be modified by contrary treatment, or the bright red image produced by the long exposure and suitable development of a pure chloride film may be preferably toned with gold or platinum.

It must be borne in mind that the picture formed by the exposure and subsequent development in hot water consists of varying thicknesses of a mixture of gelatine and chloride or bromide of silver in the same proportions throughout, and that the highest lights, if the exposure and development have been correctly performed, consist of bare glass, carrying neither silver to reduce nor gelatine to stain. From which it follows, that however far the reducing process or the staining may be carried, there can be no degradation of those lights; that the only care necessary in the former is to see that it is carried far enough, and in the latter, or the toning, that the operation is arrested when the right colour is obtained.

For purposes of experiment I have treated the prints produced by this method after the manner of single transfer carbon prints; that is, I have transferred them after exposure to paper for the first development, but the result is not satisfactory, as the subsequent operations stain the support. But they may be developed on glass and finally retransferred to double transfer paper, when effects greatly resembling Alpha prints can be obtained if a chloride paper be used.

In using the Obernetter paper a full exposure should be given in the printing frame in order to get an image as rich in silver as the comparatively thin layer will permit; but I have occasionally experienced difficulty in stripping the original paper away in the hot water development, especially with "hard" negatives when the exposure has been prolonged. This I have attributed to the fact of the sensitive emulsion being spread upon paper prepared with an insoluble layer of gelatine, which if the whole thickness of emulsion be rendered insoluble by light adheres permanently to it and prevents the paper coming away.

The exposure will be generally much shorter than an ordinary carbon print, on account of the light colour of the sensitive layer, which permits the light to penetrate more rapidly and deeply. One other method I have tried with tolerable success places the paper more under the conditions of ordinary pigment tissue, and practically prevents the light penetrating to a sufficient depth to cement the image to the paper. This consists in exposing the emulsion paper to light before treating with bichromate in order to blacken it uniformly, and if possible throughout its whole thickness. It is then, when sensitised, practically bichromated tissue, pigmented with reduced silver of the same tint as that presented by an unfixed gelatino-chloride print produced in the ordinary manner, and when developed the image simply requires toning, without any fixing to complete it.

In employing the commercial paper I find it better to employ a rather weak bichromate bath, as this enables the comparatively thin film of emulsion to present a stronger contrast than would be the case if a sensitising solution of ordinary strength were employed. About two and a half per cent. I prefer, and I make the solution as follows. Take—

Bichromate of potash	½ ounce.
Ammonia.....	9 s.
Water	10 ounces.

Dissolve the bichromate and then add sufficient ammonia to remove the deep orange colour of the solution, taking care not to render it alkaline. Then add—

Chloride of sodium	1 drachm.
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Dissolve, filter, and the solution when cold is ready for use.

The chloride of sodium is added with a view of converting the free silver in the paper; if this be not done, the paper when sensitised will be of a bright red colour from the formation of silver chromate, the effect of which in the subsequent operations, beyond lengthening the exposure, I am unable to speak to, not having tried. The paper is immersed, or floated face downwards on the solution until it lies perfectly flat, after which it is drawn over a glass rod to remove the superfluous solution from both sides, or, better still, squeegeed on to glass for the same purpose and then hung up to dry, which it will do very rapidly. It should not be dried in a room where gas is kept burning for any length of time, and it is needless to say that the same precautions as would be taken with albumenised paper to protect it from light, or even greater, must be observed with this.

I omitted to say that the practice adopted by some carbon printers of sensitising by floating the back of the paper on the solution will not answer in this process, or at least with this particular sample of

paper, as the insoluble substratum causes the bichromate to penetrate imperfectly and unequally.

When perfectly dry, the paper is ready for the printing frame. In cutting it to size, it is advisable to use scissors or a sharp knife, in order to leave clean edges, which will greatly reduce the chance of the picture leaving the glass during development. It is also absolutely necessary, as in carbon printing, to employ a "safe edge," that is, a mask of opaque paper; or when the negative is to be printed full size, an edging of black varnish is applied to it, in order that a narrow strip round the edges of the tissue shall be protected from the action of light. If this be neglected, if indeed the smallest portion of the edge of the print be hardened by the action of light, it is certain to leave the glass during development. H. Y. E. COTTESWORTH.

(To be continued.)

PHYSICAL PROPERTIES OF COAL-TAR COLOURS.

As a good deal of interest is now being displayed in the action of various dyes on gelatine dry plates, it is desirable that the conditions of the solution and application of these pigments should be thoroughly understood. I believe that dyes have an important future before them in connection with photography, not only as a means of making properly graduated negatives of coloured subjects, but also as a medium for producing coloured prints from those negatives.

If we try to dissolve the dyes, we find remarkable differences in their behaviour. Some, such as aniline blue, orange, and black, also most eosines, dissolve in cold water, but not in alcohol; others, as roseine, aurine, magenta, and crimson, dissolve readily in alcohol but not in cold water; while there are some which are only slightly soluble in either, such as certain yellow and brown pigments.

There is one solvent, however, which dissolves all these dyes, and that is boiling water. When the solution cools, the dye is precipitated as a fine powder, if it is a spirit-soluble specimen.

Some of the dyes, if dissolved in boiling water and then allowed to cool, are not precipitated, but remain in suspension in the liquid; they are still transparent, but usually have not the brilliance of tint they possess in the heated state. They are in the condition of ordinary artists' water colours, which do not form perfect solutions, for if left at rest for some time the colour settles to the bottom and leaves the liquid clear. The blue-green dye behaves in this manner in cold water, but is perfectly soluble in alcohol, in which it exhibits its full brilliance of tint. The eosines also do not always form a perfect solution in cold water, and if a gelatine plate is immersed in a cold solution of this, it will not really dye the plate, but will settle on the film in the same way as ordinary Prussian blue. The colour is thus applied in the form of a powder or paste, which however fine and impalpable in its composition, is not likely to have the same result that a true stain would produce. This is the reason why weak ammonia is sometimes employed in conjunction with dyes in order to effect a more complete solution, and thus obtain the effect that would be obtained by adding the colour to the emulsion at boiling water heat.

Hence we find that to produce a perfect stain or dye on a gelatine plate, or any other susceptible material, it is necessary to have a perfect solution, and not a mere holding in suspension of the dye in the fluid. If gelatine plates would stand dipping in boiling hot water, as a linen cloth might be treated, it would be a simple matter enough to dye plates properly; but as their constitution is not sufficiently hardy to stand such a procedure, it is necessary to adopt other means of staining, of which the ammonia method is one. The latter system, however, suffers from the drawback of requiring proper dark boxes for the plates to dry in, which usually takes a long time. If a suitable dye could be applied to an ordinary plate in the same manner and with the same ease as a film of collodion or varnish, and the gelatine was really dyed with the tint, I imagine the use of stained plates would become far more general than at present.

There are certain substances that are not capable of being dyed. Thus, for instance, I am not aware that gum arabic or gum tragacanth can be dyed. These gums may be dissolved in cold water and mixed with a solution of aniline blue, for example, but this results only in a mechanical mixture. The blue dye would also remain transparent when dry if no gum was mixed with it. If a solution of gum arabic is added to a magenta dye at boiling water heat and kept at that heat until dry, it will be found that the colour has become opaque, just as it would if no gum were present; in other words, no union has taken place between the two substances, and the gum is not dyed.

Now let us try gelatine in the same way; the result is totally

different. The gelatine dissolves in the hot water and combines with the dye, which may be any one of the coal-tar colours, and when again cool and dry, the gelatine will be dyed a brilliant tint, which cannot be washed out by cold water.

Hence gelatine is an excellent medium for applying dyes to the surface of glass plates so as to produce the effect of stained glass. The gelatine and the dye being first dissolved separately in hot water, and then mixed together while still hot, will form a mixture that can be spread on any surface as easily as undyed gelatine. It can be applied with a brush, if the plate and the mixture are both warm; and photographic lantern slides, or window transparencies, tinted with such colours, may be relied upon to be perfectly transparent, and as durable in their tints as the ordinary water colours used by artists. The dyed gelatine when thus used as painting material will far surpass the ordinary methods of colouring, both in richness of tint and absolute transparency.

Another way of preparing dyes, namely, with ox-gall and glycerine, as transparent colours, was lately published by me. This possesses the advantage of having "dabbing" capabilities, and also of being workable at ordinary temperatures; the tints so produced are not quite so brilliant in some cases, and being more liable to attract moisture, require protecting with mastic varnish, which is unnecessary with gelatine.

Plain collodion is an excellent vehicle for coating flat surfaces with dyes. These are first dissolved in a little alcohol, or in the case of eosine, aniline blue, and orange, in a few drops of water, and the solution added to the collodion. This tinted collodion may be used to coat glass plates, which will then be indistinguishable in appearance from stained glass. The collodion is really stained or dyed; the colour is so "fast" that neither cold nor hot, nor even boiling water, will remove the stain. Gelatine plates may be coated with such a film in the dark room; in this case, the gelatine is not itself stained, as the dye keeps to the collodion.

We may now turn to shellac as a medium for conveying a dye tint to a flat surface. It is much inferior to either gelatine or collodion for this purpose, as the colour loses all brilliance and becomes semi-opaque. For instance, if roseine is added to negative varnish, and a plate is coated with the mixture, the colour is at first a bright crimson, which rapidly turns darker as the alcohol evaporates, until it is of a dark violet tint, very different to the former. It is not easy to combine aniline, orange, and blue—which are insoluble in spirits—with a shellac solution, as the necessary addition of a little water causes a precipitate in the varnish.

Glycerine possesses the property of combining with most dyes, so as to hold them in solution without any precipitation of the pigment taking place. It is necessary to dissolve the dye in alcohol or water before adding it to the glycerine.

A solution of eosine and aniline blue or orange may be made in alcohol by previously dissolving the dye in a few drops of water and then adding it to the spirit. The solution in the case of eosine is then strongly fluorescent; and in the case of aniline orange, which is soluble in cold water, the alcoholic mixture is also fluorescent, though to a less extent than eosine. If fluorescence in dyes denotes any special fitness for preparing colour-sensitive plates, then aniline yellow or orange (the colour is between these two) is suitable for such a purpose. If such a dye is thus added to a mixture of water and spirits in the proportion of about one to six, a gelatine dry plate may be coated with the mixture by pouring, as with ordinary varnish, and will receive a uniform film, and if the plate, before coating, is heated to about 200° and then coated with the solution, the surplus portion of which is quickly poured off, the result will be that the alcohol will first evaporate, leaving a thin liquid film of the dye in water on the hot plate. This water is of course instantly absorbed by the gelatine, and the heated surface of the latter is at the same time dyed by the pigment. The quantity of water left on the plate is so small that the film is dry in a very short time and ready for use. To secure a perfectly uniform stain it is perhaps advisable to use a weak solution of the dye and to repeat the dyeing process two or three times, heating the plate between each application, and using a different corner each time to flow off the surplus fluid by.

A light-tight tin box may be used to enclose the plate during the heating, which can easily be done over a gas burner.

It seems to me that such a means of applying a dye insoluble in alcohol is equivalent to the use of weak ammonia with the colour, and the time necessary for the drying of the plate in the latter system is saved. The dye is mainly confined to the surface of the film, which should be an advantage, as tending to produce greater vigour and pluck in the negative. It is only in the high lights that the deposit of reduced silver reaches the back of the film; the half tones are confined to the surface.

ALBERT WM. SCOTT.

PORTABLE DARK TENTS.

"Why should spirit levels be loose?" was recently asked in the *JOURNAL*. Why, indeed. I lately saw a 15 x 12 camera made by the *doyen* of the craft for outdoor use in the Peninsula. The base-board had a couple of oblong levels let in thus—, an arrangement, I should imagine, of immense service in plumbing the camera. The idea is, of course, far from novel, the single level in the base-board being, comparatively speaking, as old as the hills; nevertheless, I think it is of sufficient utility to deserve the notice of those sticklers who are constantly on the alert for time-saving fads. Levels suitable for the purpose being so cheap, the wonder is that they are not in greater use. Oddly enough, nearly every instructor and instruction-book vaguely counsels the tyro to "judge" when the camera is properly adjusted. This is simply scamping a highly important department of the procedure preliminary to exposure. "Judging" should be avoided when certainty of correctness may be ensured so easily and cheaply. *Appropos* of time-savers, it seems incomprehensible that to the so-called "Patent" cameras only two very excellent but simple methods of husbanding time and trouble should be applied and not to the ordinary or "garden" variety—costing, as they do, less to engineer than the older and less useful methods. I refer to the small stretches of grooving (I have seen a "catch" fixed for the same purpose, but catches on the camera are best tabooed) that permit of the double back being fitted to its place, without the necessity of sliding, and also to a similar idea applied to the lens front. True, these are old dodges; but the pity is that they are not more widely taken advantage of, for their value to-day is greater than ever it was. His dark back and front affixed to his camera in this manner, the peripatetic tourist laughs at warpings, swellings, dry and moist vagaries of mahogany, and the endless other "cussednesses" to which his erratic apparatus is ordinarily susceptible. Who has not endured the agony evoked by the double back that would not slide in the camera without ruining the focus of the picture, or the eccentricities of his sliding front when in a similar mood? which brings me to a suggestion concerning the use of alternative lenses.

I presume the difficulty experienced in rapidly substituting one lens for another has been felt by all landscapists at one time or another; but I hold that a "turntable" as a commercial success is an impossibility. It would be a very fine notion if everybody used exactly the same lenses as their neighbours—but they don't and won't. Now in modern view lenses the range of size is not very great. Remembering that the chief makers readily gave in their adhesion to the adoption of a common system of diaphragms, might not an attempt be made to induce them, in the instances, say, of their asymmetrical and rectilinear series—which up to 12 x 10 are quite portable—to fit to them flanges of uniform diameter which would admit of instant union with the front flange, bayonet-joint fashion, or otherwise? This idea though necessarily crude, will not, I hope, be deemed altogether Utopian. Assuredly the present manner of fixing the lens to the camera front and the awkward fact that mostly a fresh lens demands a fresh front are miserable survivals worthy alone of limbo.

If, in the foregoing reflections I have rashly trodden ground which the accomplished apostle of the camera of the future has made all his own, I trust that this slight contribution to the literature of his ideal—an ideal, I'm afraid, some distance off realisation—will not be despised. Truly, remembering his '84 and subsequent advocacies, one is tempted to envy Mr. Harrison his perennial enthusiasm; although whilst applauding his devotion to a pet dogma one cannot help thinking that under his tutelage the camera of the future—like the music of that persecuted period—would be something fearful and wonderful to contemplate. Micrometrical adjustments, *et hoc*, are luxuries; luxuries are the quarry of epicures; and epics were once defined by a mudlark as "Coves wot's allus eatin'!" But to my subject proper.

Probably in all the press and hurry of the many reforms engendered by the successful introduction of the popular negative process now in vogue, few of the implements without which at one time no photographic kit could be considered complete have undergone less alteration than the portable dark tent. Once upon a time the amateur tourist was a veritable *rara avis*; only professional landscapists systematically stumped the country, a dark tent in some shape or form, and very often on wheels, being an indispensable item of their baggage. This demand led to the introduction of the dark tent as at present known to us; in reality it is lineally descended from the poor and battered movables one sometimes encounters at Hampstead and elsewhere. Dark tents and dry plates, somehow or another, seem to have little affinity. About the former I cannot help thinking there still lingers an indescribable collodionic noma. They belong to other days; they come of a period which wanted levelling up to the exalted sensitiveness boasted by modern films, when lightness and compactness of form were not *desiderata*, when space was less valuable, and ten pounds in weight of

less account than as many ounces are now. The four or five varieties of the tent now in commerce bear a strong family likeness to each other, and to their ancestors who dwelt among us a score of years since. Dry films, which have revolutionised the camera and many other things, such as lamps and stands, seem to have had no chastening effect upon these obstinate old tents, which fact should be noted down as a curiosity in its way. Why is it? I wonder that the inventor's brain, which has been so busy in many other and far less important paths, has entirely ignored the poor dark tent, which, if a necessity of photographic practice twenty years ago, is equally, if not more, an object of paramount importance under existing conditions. This is surely a point deserving of our attention, for there is most certainly a field open to some of our inventors if they will condescend to transfer their prolific ideas from the arid deserts in which they are at present roaming to the more fertile plains indicated.

A portable piece of apparatus, call it a tent or what you will, that may be carried about from place to place with the same ease as a camera, and in which any number of plates may be developed, is essential to the practice of modern photography. Development in the field and away from home has no more been obviated by dry films than a plurality of slides has been rendered unnecessary by the introduction of a paper support. Development just after exposure would be vastly more popular if the means were at hand; the reason that there is such a wide predilection in favour of postponing development until one's return from the country or abroad, is that no serious attempt has been made to provide tourists with an efficacious developing media—for the portable dark tent certainly is not. Few country houses and fewer hotels possess or are likely to possess dark rooms—a recent attempt to induce hotel proprietors in this country to attach them to their premises having proved abortive, as it was bound to—whilst the studio of the local photographer is only available in the minority of cases. Tentative development, *en route*, is a great boon, but it is rarely possible, especially on board ship, or in foreign hotels and strange places generally. Hence, there is ample scope for the introduction of a really good developing tent. The inference that the present tent of commerce is not a good one will be readily drawn, and it therefore behoves me to endeavour to account for its comparative unpopularity, and its paucity of numbers amongst outdoor workers. I can do so in a couple of sentences. This so-called dark tent is not portable at all. It is cumbersome, unmanageable, and generally archaic; it is twice as heavy as it should be; it is not ventilated; it is too dear—in fact, this same dark tent was built for wet-plate work, and dry-plate workers have a right to demand a new edition of it brought down to date. Let us hope it is in the press. To resume: A whole-plate tent and stand weigh (without case) something like twenty-seven pounds; a 10×8, thirty pounds; a 12×10, thirty-three pounds. The whole-plate is useless; it is too small—one literally has not room to move properly. The 10×8 and 12×10 admit of the elbows being placed at an akimbo angle, but their several weights (the tents, not the elbows) are appalling.

MARSTON MOORE.

(To be continued.)

THE OFF SEASON.

WINTER! the very name has a depressing influence on photographers, and its actualities—widespread trouble and inconvenience. Fortunately, as years pass on, new processes are discovered—films so sensitive to light that the dull and dreary period is robbed of half its horrors; in another decade ordinary studio work may preferably be done by gaslight, who can say? Formerly, with the dark weather came enforced idleness, sitters were few and far between, and negatives left a great deal to be desired. Icy cold was the usual temperature of solutions, bottles, plates, and fingers, and an hour or two each morning was devoted to a general warm up, with cracked bottles and glassware generally to be reckoned amongst the casualties of the week. With the landscape man the whole paraphernalia of his occupation was relegated to out-of-the-way shelves and corners, there to lie perdu until the longer days and brighter light of spring once again fanned the dormant spark of his enthusiasm and he was tempted to overhaul, repair, and put into working order all that might be required for a summer campaign.

The greatest winter trouble now is snow filling up and blocking out the little light there is. With the flat or wide-angle roof most trouble of all is experienced, both in breakage and blocking, and after a heavy fall of snow a long time is occupied in clearing it away. High-pitched roofs are superior in every way; a good heat in the studio will melt the underlying portion and permit the snow to slip off by its own weight, an advantage not to be lightly estimated in glass roof construction. Another matter in this connection is having

easy access to the outside of the roof for painting, repairs, &c. Many otherwise unexceptional glass rooms are deficient in this respect, and the worry and inconvenience caused thereby is considerable. In cleaning the glass from the yellow smoky deposit that obstructs so much valuable light, it is most readily done with a rubber moistened with methylated spirit; water will often fail to thoroughly remove it. The light in winter being so much weaker than at other periods of the year, it behoves us to get rid of all possible obstructions. The probability of under exposure from this reason is supplemented by lowness of temperature indicates the use of solutions artificially heated. There are few plates that will not stand a temperature of 65° to 70° without injury. Developers and fixing baths should not, therefore, be below this temperature, more especially the hyposulphite bath; the washing water also should not be less than 60°. The effect of low temperature upon different solutions has been recently and ably written upon in this JOURNAL, in which the author pointed out the variations of the strength of saturated solutions altering with the temperature, a very important fact, and should always be kept in mind.

It will be, therefore, seen that a variety of causes may operate at one and the same time to interfere with the production of the photographic image in cold, gloomy weather, that are altogether absent under more genial circumstances. Printing operations are also much interfered with; but the principal danger to be apprehended is imperfect fixation of the proof unless the matter of temperature is strictly observed, as a very cold solution of hypo is almost inert. Warm water should be used all through the toning, fixing, and washing operations; and if possible the whole of the workrooms should be properly and comfortably warmed. So much, then, for conditions of successful working, about which a little reiteration is not only allowable but necessary.

A great deal of the trouble of winter photography has been abolished since gelatino-bromide plates came into general favour. They are always ready for immediate use, and by their extra sensitiveness available for working in such light that was under the old dispensation useless; but I am inclined to think that neither rapidity of plates or time of exposure are equivalent to a good light, or make up for it in any way other than a sort of compromise. It is true if we can see an object we can photograph it, and, even in a very bad light, get detail, but compare such a photograph with one of the same thing taken in a good light and mark the difference; quality will be wanting, and a certain amount of flatness will prevail that is fatal to fine effect. I think it may be set down as a rule that no subject having different planes where light and shadow are necessary for effect can be rendered as well in a bad light as a good one, even if all the requisite detail is secured. The question may be asked, What is a bad light? and answered by saying light is bad when small in quantity, of a bad colour and wanting in transparency, and what there is of it falling in a wrong direction. Want of transparency in a bad light is its worst fault, and to this we may attribute its attending effect. The fact of it being small in quantity induces one to use as much of it as possible, and this again induces the danger of it falling in a wrong direction. So we may consider unless the object to be copied is on one plane, as a drawing, for instance, no exposure will obtain a result equivalent to one taken in a good light. Winter work of the best quality in the studio is limited in its scope when dependent on ordinary daylight. Artificial light may, however, supply its place for many purposes with advantage, especially in copying by contact, making lantern slides, photo-micrography, and reproducing negatives. The uniformity of such artificial light is so great an advantage that work of this description is preferably done by it both winter and summer.

Landscape photography in winter is practically a dead letter, with one exception, and that is for snow and frost effects, and, as if to make up for its deficiencies, these effects are exquisitely beautiful, more so than almost any other kind of picture, but, like anything else exceptionally desirable, the trouble in securing them is proportionately difficult. The physical difficulties of tramping for miles up to the knees in snow, weighted with camera and traps, is no mean one. Happy they who reside in the midst of their hunting-grounds without having a tiresome journey before they begin work. These are exceptionally fortunate, as the finest hoar-frost effects last so short a time that half an hour may be all the difference between success and disappointment. The few opportunities offered to residents in large towns prevents any great amount of practice in this direction, and there are no doubt thousands of photographers who have never attempted it.

The beautiful pictures that occasionally grace the walls of our exhibitions show the possibilities of winter work, and are, in fact, a revelation; and dry plates also make it comparatively easy. Precautions that will conduce to success are: Firstly, exposure, which must be somewhat short, say two seconds, as compared with three

without snow; secondly, plates that will work without blurring; and, thirdly, a developer that will give good contrast. One successful worker in this direction advocates the use of very weak and slow developers; but whatever method of working is adopted, the resulting negatives must not be very dense, and must be clear in the shadows. Over density produces a chalky effect, and in printing by the time any detail is obtained in the light portion that in the shadows is hopelessly buried. Thin negatives are therefore indicated. Snow is at its best directly it has fallen. It soon loses its light, feathery character, and by partially melting and settling down becomes more opaque and solid, and a photograph of it is more chalky in effect.

To the casual observer the snow seems lighter in tint than the sky; this is not the case, unless under special atmospheric conditions, such as a yellow cloud in front, and the sun at the side or back of the observer. Snow having no luminosity in itself can but reflect part of the light it receives, and so must necessarily be darker than the sky, from which the illumination is derived; in the majority of instances diffused light is all he has to work by. If, however, he is so fortunate as to get with good snow blue sky and bright sunshine, the more prominent surfaces of the snow will reflect light sufficiently strong to equal that of the sky on the photographic plate, and possibly with orthochromatic plates be rendered lighter than the sky, but in a general way, with ordinary plates, the sky will come out lighter than the snow. The great difference in the respective luminosity of sky and snow, to the advantage of the latter, as usually rendered in paintings, is artistic licence, and not according to nature. There is no denying the impression conveyed is more realistic, and being so, is quite justifiable.

General landscape work in winter is always unsatisfactory; there is a bare desolateness about such views that does away with much of their charm. The absence of ground foliage is one of the greatest drawbacks to picturesque effect; the edges of rivers and brooks are smooth and monotonous; in rocky scenery the vegetation, what there is of it, hangs limp and withered. It is by attempting such work that the great value of foliage in picture making is thoroughly appreciated. The seaside is perhaps little changed as anywhere, but the cold winds and general discomfort are serious checks to enthusiasm. Now and then a good picture or special effect—skating scene, for instance, may be secured; but, take it all together, general landscape work in winter is better left alone, the game is scarcely worth the candle.

Snow scenes made up in the studio are more popular in Canada than England, and many very excellent imitations are turned out. Owing to the dryness of the atmosphere, salt is a favourite means of representing fallen snow on the ground and surroundings, but would in this country be unsuitable. I have found coarse oatmeal answer very well and give a good snowy effect on draperies and easily shaken off afterwards. The effect of falling and drifting snow is obtained by sprinkling the surface of the negative with Chinese white made into a suitable consistency with water and distributed by aid of a tooth-brush charged with it drawn across a comb, or a spray diffusion may be used. To give the effect of drifting, a soft camel-hair brush is drawn lightly across from the lower to the upper part before the white has dried; this, on the information of Mr. Edwards, is the method adopted by Notman, of Montreal, a gentleman whose work in this direction is well known. In addition to this a few flakes may be specially painted in with a brush, and others also removed from the face where they interfere with the effect or injure the likeness. Bad weather of the off season may be utilised for experiments and repairs, and to a photographer of an ingenious turn of mind affords a leisure to work out pet ideas that in the bright summer weather may be put to the test of utility.

EDWARD DUNMORE.

PORTRAITURE.

[A Communication to the Camera Club.]

THE most difficult branch of photography is portraiture; and not only is it the most difficult to learn, but it is also the most difficult to treat well in words, for the correct delineation of the human form being the highest branch in all the arts, it therefore requires the most skill.

If the beginner have not already a knowledge of the art, nor an acquaintance, somewhat familiar, with the works of painters of note, he will find his own work the easier—it is needless to say better—by studying the celebrated figure-pieces and portraits in the National and other galleries, especially those of the Old Masters, Sir Joshua Reynolds and Thomas Gainsborough. Among the first, Murillo's *Spanish Boy* may be studied for the lighting of a face almost wholly

in half tone, and the management of the high light on the shoulder and cheek. The child in the same painter's *Holy Family* is a beautiful example of the action of a figure; the lighting in it may also be noticed for the method with which all the surroundings are made to tend to the principal figure. Van Ostade's *Portrait of a Boy* is another picture full of lessons in portraiture. Of the two latter masters, *Portraits of Two Gentlemen*, by Sir Joshua, teaches the arrangement of two figures in the one picture, neither attracting more attention than the other, at the same time it being complete as a whole. *Portrait of Himself*, by the same, should be observed for the high light. In Gainsborough's *Parish Clerk*, the carrying on of the light to the hand and top of the book show the value of balance in light and shade, while the shadows of the face should be specially noted. For the management of background in reference to figure, George Romney's *Parson's Daughter* can teach us much, by observing that it is darkest at the base of the picture, becoming lighter towards the centre, and darker again at the top, thus giving the feeling of atmosphere. Sir John Opie's picture, *Mary Wolstoncraft*, is a fine lesson in the turn of a head. And lastly, for figures and landscape combined, *The Vagrants*, by Walker, should not be overlooked, as this picture in itself may be said to teach everything. In the landscape the light and shade and lines all tend to the highest light in the distance, while in the figures, the movement and repose, grouping, and the effects of outdoor lighting on the faces, should be observed; while, finally, lines of drapery may be learnt and understood in the standing woman's figure. Also, it should not be omitted to notice the yellow tints of the farthest middle distance placed immediately against the distant blue, that makes the spectator feel the stretch of country lying between, though out of sight—photography may be made to render this effect quite correctly, as blue, the colour for distance, photographs light; while yellow, according to its admixture with other colours, is rendered darker.

These are only a very few of the works that may be studied; but, to the writer's mind, they are those most full of teaching, and are specified in the hope that what has been said will guide the beginner to what he ought to study, and to what he should see in each. He will find by close observation how nearly allied in their work are the colours themselves and the shades that represent them; but to render them truthfully in a photograph great skill is required in the knowledge of their work and action on the silver salts.

In looking at all good portraits, it will be observed that everything is made subservient to the figure; not only that, but tending to it; and in the figure itself all the lights are subordinate to the light on the face, which is the principal object. Hence in the studio the background should be selected very carefully. It is a good plan, if the room be given entirely to work of this and kindred natures, to have the walls papered with some patternless paper of a light-reflecting colour; pale blue-grey is about the best, as it will reflect sufficiently to brighten the side of the figure away from the centre of light; at the same time it will not give a white result with long exposures. Others of different tints, or partly shaded, may be used, being kept rolled tight to prevent creases when not in use; but these can be dispensed with if the photographer learn to shade the permanent one by using screens in various positions, causing them to throw soft shadows, that will darken it in the proper place without intercepting any of the rays falling on the figure from the centre of light—which should have curtains of some gauzy material for drawing over when necessary.

Now, to make a good portrait—by that I do not mean merely a representation of the sitter's features, but a picture representing individuality—many things are necessary which must be carefully observed and thought about. This can best be explained by reference to the illustrations, practice afterwards giving rapidity to the process.

[The paper here referred to an interesting series of examples sent by Mostyn Clarke as illustrations of the points he wished to emphasise, and concluded as follows]:—

Before proceeding to the question of exposures, a few words may be said on the subject of the proportions of the boundary-lines of pictures, which are, in some cases, the actual frame. It will be enough to suggest the two following facts, resulting from observation, leaving you to reason and apply them for yourselves.

The length and breadth of the frame must be relatively proportionate to the length and breadth of the figure shown.

The distance between the top of the frame and the highest point of the head will be found to decrease, and that between the side of the frame and face (on the outlooking side) to increase proportionately as the length of the frame increases over the breadth, and *vice versa*.

By the word "frame" in the above is meant the boundary-line of the picture itself, and not the outer frame.

The exposures necessary for portraits taken in a studio such as that described cannot be otherwise than protracted; therefore it is well to choose such positions as will be the least trying to the sitter's powers of remaining at rest.

The reason, as before stated, for this great length of exposure is, that without it we should have no broad sweeps of light and shade, but rather patchy results. For the exposures of portraits out of doors a shorter time is required; about five to ten seconds, according to the state of the light and the time of day, the light being strongest from about eleven until two o'clock, and considerably weaker after three o'clock in summer. A good idea of its varying strength can be obtained by the beginner experimenting with sensitised paper at various hours. As to the stops to be used for portraits in the studio, a medium ($\frac{1}{4}$ or $\frac{1}{8}$) has been found to give the most satisfactory results, as this size does not protract the exposure, while it keeps the high lights under control. For outdoor portraits the rules are the same as those for landscape.

J. F. MOSTYN CLARKE.

THE LANTERN ARRANGEMENTS FOR MR. PRINGLE'S DUNDEE LECTURE.

MR. A. PRINGLE delivered a lecture in Dundee on February 10 before an audience numbering 2000 persons assembled in our largest public hall, and as the arrangements were on a scale a little out of the usual, and for the guidance of others placed in a similar position, I have thought that a few notes in the JOURNAL might not be out of place.

The arrangements were carried out by a small local committee appointed by the Dundee and East of Scotland Photographic Association, in consultation with Mr. Pringle. As the result of a former experience, it was admitted by most of the members present that a fifteen-foot, or even a twenty-foot screen, was simply nowhere in the hall to be used by Mr. Pringle, which measured one hundred and twenty feet from wall to wall. A screen which in a smaller hall was quite large appeared in this hall like an illuminated saucer. It was simply swamped by the great space around. It was decided to make a sheet of the proper size for the hall, that is to say, of such a size that when looked at from two-thirds of the hall's length back the picture would appear of natural proportion. After some "big thinks," thirty feet was decided on as the size of the sheet, which was manufactured of a good cotton, six feet wide, the seams running the whole length of the sheet in one direction. Brass rings about one inch diameter were securely fastened at one yard apart all round.

The next question was the illumination of this immense stretch of sheet. An ordinary blow-through jet was of course useless, and a mixed jet almost as bad. There was in contemplation the manufacture of a compound jet to play on a lime cylinder two to three inches in diameter, but after a further "big think" it was cast aside and the electric light thought of, notwithstanding the division of opinion lately expressed with reference to the electric light at the South London Society's rooms. This decision of the Committee leaked out, and amongst the other members there was a good deal of head wagging and "Take care! beware!" sort of thing. "Mr. Pringle must not be made a fool of, you know," said one. "If you use that blue, spluttering, fizzing abomination, we will have a regular *fiasco*," said a second. While a third suggested that in any case a limelight lantern should be held in readiness.

The question of lime *versus* electric light was settled in the minds of the Committee somewhat in the following way:—To illuminate this sheet properly by limelight, whatever the actual arrangement employed, would require from twenty to twenty-five feet of oxygen per hour at least, and this quantity, if burnt in the particular lantern proposed to be used (one having four-inch condensers) would mean so much heat at the condensers as to make it highly injudicious to risk it, or, as we say in our local vernacular, it would be "fell risky." A six or eight-inch condenser might have been substituted for the four-inch, but after all, and "taking one consideration with another," the limelight presented considerable although, perhaps, by no means insurmountable difficulties.

On the other hand, when it was considered that two members of the Association were practical electricians, that our ex-President offered a dynamo, and that the hall was advantageously situated as regards power, it will be seen that there was strong inducement to use the "blue and spluttering" illuminant. On putting the two electricians under oath, and duly impressing them with a sense of the great responsibility resting on the Committee, it was given as their unprejudiced opinion that were the electric light properly manipulated it would neither fizzle or splutter, or be in the least blue. The Committee cast the die on the side of electricity. What was the result?

On a night of rehearsal previous to lecture, when the whole apparatus was tried, the disc appeared not so bright as might have been expected, and the light hissed and roared in a most ominous manner. Moreover, something went wrong with the dynamo, and altogether things were not quite so satisfactory as might be wished. But the electricians said that everything would be right in their department, and if everything else was right there would be no failure. It was at once decided to wash the screen over with sized Paris white to increase the light on the disc, and

this was done in the following manner:—The rings along the top of the sheet were hung on nails driven into the bar which was to support the sheet on the night of lecture. This bar was capable of being drawn up a little at a time by block and tackle. Three men, each with a pail of the wash and an ordinary flat brush with short handle, set to work and finished in two and a quarter hours, drawing up the sheet as they finished a length horizontally. The washing was begun at eleven p.m., at a time when the hall was very warm after a crowded concert, and next morning at eleven it was not yet quite dry, but very nearly so. Let it be noted that to have the highest effect whitewash must be quite dry. As a guide to others in similar matters, a period of fifteen hours after the work is finished is not too much to allow for the drying of a sheet of this size, and providing a safe margin. When the sheet was dry the surface was all that could be desired—a dead white and very opaque. The sheet was guyed, stretched tight, and draped with an ample supply of red cloth, presented to the Association by our ex-President. The lens employed was a portrait objective of nine-inch focus, which gave crisp definition to the edge.

The arrangements were completed by the formation of a lantern room, through a hole in the wall of which the nose of the lens projected, the fitting up of an electric bell between the lecturer's table and the lantern room, and the adjustment of an instantaneous slide-shifting apparatus. I may be allowed to remark, as a piece of advice, that unless the electric current is to be obtained from a permanent installation, the greatest care should be taken that everything in connection with the machinery department be as perfect as possible. The dynamo should be very firmly fixed, and the driving belt should be an old one, or at least one that has been very perfectly stretched. The bearings of the machine should be provided with continuous lubricators, and the brushes carefully adjusted. Inattention to any one of the smallest of such details is quite enough to bring an exhibition to a premature end, but with ordinary and patient care there is almost a perfect certainty of success. On the night of the lecture everything, down to the smallest particular, wrought very well. The light was very steady and very silent, so much so that in the lantern room a whisper spoken by one of the operators was distinctly heard.

And now a word as to the employment of the electric light for optical lantern purposes. Objection has been taken to the colour of the light, if I mistake not, by Mr. Smith and others. On the face of it, this appears to me to be very absurd. When daylight is admitted to be "blue," and not of the correct colour for viewing objects and pictures, then the electric light may run some chance of condemnation, but as long as daylight forms the natural standard, the electric, as being perhaps nearest it of all artificial lights, cannot in the nature of things be held to give an unnatural tint. The tint may be unusual and quite different from an oil lantern—that is another matter. The absolute brightness of the disc is a matter of size of disc. The South London Society's disc, I understand, was eighteen feet. This may have caused too much glare; in other words, a picture too bright to be comfortably looked at, although I hardly think this could have been the case. Our Dundee disc, if the above figure be correct, was two and three-quarter times the London one in superficial area, and we can say that for the illumination of such a disc the electric light, in the opinion of every one present competent to judge, is everything that could be desired.

These few remarks are confined to the actual lantern arrangements. It would be most ungracious were I not to add that Mr. Pringle's lecture was very highly appreciated by the Photographic Association and by the people of Dundee, and that he has left an impression which will not easily be effaced.

G. D. MACDONALD

ON THE COMPOSITION OF THE PICTORIAL.

[Abstract of an Address given at the Photographic Club.]

The composition of that which is calculated to be made pictorial depends very much on the taste, aptitude, and culture, of the mind who desires to pursue it. It takes much time and application to those who are well read on the subject of art to put this into practice, for without a fine sense naturally of that which is picturesque there arises much difficulty in the selection of subject. However, when that is present it is gratifying to state that with a knowledge of leading principles, and the methods of employing them, the difficulties very soon disappear. The photographer has many advantages over the draughtsman, because when once he knows the proper standpoint to view the subject, nature, reflected by the camera, greatly assists him in the arrangement, whereas the draughtsman has to gather it all by his own mind and put it up besides. Certainly he has advantages again over the photographer that he can reject at his pleasure that which does not suit his arrangement, but, on the whole, it is much easier to compose by the assistance of the camera than it is without it. Never forget that the first essential is a feeling after the picturesque and what is really beautiful in nature, then comes the desirability of the art, by which one is able to select, separate, arrange, and present, that which is most valuable, beautiful, and impressive. It is to a knowledge of this, then, that I ask your especial attention to-night.

Two years ago I spoke on this subject at the South London Photographic Society. I had not then many prepared illustrations, neither

were they exhibited by the aid of the lantern, but since then I have prepared some lantern slides, and hope, through them, to show you what is to be aimed at and what to avoid.

The great properties of a subject in its treatment are balance of interest, but not equal in importance—being diverse in character, but always in unity—the principal part, such as a head, taking the lead, and the rest of subject matter following in expressiveness, in strict relation to each other, no portion unoccupied, and yet no redundancy. The more variety one can render in the treatment the more does it bespeak his knowledge and inventive power.

The importance of the limit or bounds of the subject, called the boundary lines, I now call your attention to.

Why is it that pictures are not constructed with the breadth and length of them being equal? My reply to the question is, You never see a picture in any exhibition so bounded, unless it be when a circular form is enclosed. Such pictures are unavoidably too much concentrated, consequently limiting diversity of arrangement; and the reason why lantern slides are so constructed is, because they serve the purpose of diagrams generally employed in scientific illustrations. But a diagram is not a picture, although, unfortunately, the square form of the ordinary lantern slide has been used in the exhibition of scenery, yet the subject should only have the boundary line suited to it visible; without this special limit to the subject it has not its peculiar attribute that defines the picture. This, I trust, will be fully demonstrated in the slides to be exhibited to-night.

[Here followed the projection of fifty-eight pictures on the screen, each of which was accompanied by critical remarks, which would not be understood without the illustrations. The first seven or so were diagrams illustrating the principle and method of pictorial boundaries—that the most perfect form of a parallelogram was made by the length being determined by the diagonal of the square of the breadth; that other forms might be used, but that the square shape of a picture was to be, if possible, avoided. That a parallelogram, when divided by odd numbers—three, five, or seven, each way—the intersections gave *forte* points, on which the principal parts of a subject were to rest; that they were to be varied in their choice, thus producing variety of treatment. Mr. Macbeth pointed out the importance of the place of the horizontal line, according to the subject—whether in a portrait, a landscape, or sea view. These, and a few minor essentials, were examined and explained in the varied forms of composition submitted by the illustrations, under different subdivisions, and always made by odd numbers, after which Mr. Macbeth continued.]

In bringing this lecture to a close, I trust that the principle of subdividing a given sphere constituting *forte* points, as now fully illustrated, is thoroughly understood, and will be found serviceable in the composition of the pictorial. Some have strong views in favour of naturalistic production only being attempted—i.e., taking nature simply as you may find it. They are very jealous of rules of art, regarding them as the conventionalities of schools. Well, if anything does give a true rendering or reflection of nature as it is at the moment, it is photography. But as you see every day in the attempts of beginners, there is little concentration of the subject, and no variety of treatment to make it interesting, consequently you must have recourse to some method in order to govern and regulate the subject, otherwise it stands a bad chance of being a picture. Imagine any one sitting down to a piano and rattling over the keys at any rate—what kind of music is that? As in the art of speaking or writing a language, a grammar *must* be introduced in order to regulate words and sentences.

It is a difficult thing to subject the rules of picture making to the requirements and capacity of photography. It is a branch of study meeting the claims of science as much, and fully more so, than that of art. To embrace the latter, the claims of art require much care and scrupulousness in what is introduced for its treatment. The tendency of photography in making application of art (especially the canons of fine art) is, that it attempts too much beyond its province and power. It is mainly a mechanical art, and very dependent on the instrumentalities and means for carrying out its designs—means and appliances not common to any other art—so that thereby its simplicity and purity is greatly endangered through the attempts of many who find the development of a plate otherwise easy.

In my former lecture I alluded to the attempts of building up a composition from various pieces of other negatives than that on hand, and which may have been taken for the very purpose. I hold that it is hardly legitimate to do so, inasmuch as the method is not only not so satisfactory as those otherwise gone about by the arrangements of actual objects made in the studio, with figures and accessories so placed so that you can ultimately photograph the whole subject in a completed state, but to have recourse to such a bolstered method with separate pieces, I think, is very unworthy of being allied to the higher associations of fine art. It has been asked, If artists do so why may not photographers? I presume when it is said that artists do so, it is meant they make studies from nature and apply them to a subject? Certainly they do, and without this application it is not to be expected they can do much if left to their own resources. Neither can the photographer. I wish him to make as many studies as he possibly can, try them in every advantageous way, then, when thoroughly conceived and designed, work out the subject on an actual field, either within or out-of-doors, and then

photograph the same in its completed form. This is, I conceive, the legitimate province of photography, and it should be carefully conserved.

Mark you, gentlemen, I do not object to any contrivance on that field, provided it is worthy of the subject, for nothing that is vulgar or mean in character should be tolerated for a moment. It is the exercise of a fine taste, as well as fine arrangement, that will elevate and ennoble such efforts. No one who knows the deep interest I have all along taken in the history and practice of photography, and especially in fostering and protecting the art element in association with it, must feel that I can have no antagonism to what I conceive to be a legitimate pursuit of it; but as to the method that is often resorted to in working out a composition by separate composite parts, I have very strong convictions against it. Very few who have attempted it have succeeded in concealing their contrivances, and have forgotten the old saying, '*Arts celare artem.*' The main tendency of such a method is, that the terminations of each part do not sufficiently blend with the parts in juxtaposition, consequently they appear not unlike the side-wings of a theatrical stage. I cannot understand why the simpler method to which I have alluded should not be attempted more. Perhaps it is for the want of accommodation, as such work would require a room for itself. Those who have outdoor accommodation would succeed admirably, and would well repay them for their pains, working out simple studies under the effects of natural light, either in direct sunlight or diffused. I am satisfied in my own mind that by this means you would successfully cope with the arrangements of higher art, provided you are able to control and regulate the action of your figures. The main dependence you have, after your own knowledge, is the feeling that you are able to infuse into your characters in carrying out your designs. It is in this that the merit of both Mr. Robinson and Mr. Dixon's work mainly consists—not in their manipulative arrangements on a negative, for these are not unfrequently too apparent. I think it is Mr. Wall who has written in the *JOURNAL* concerning this (the feeling thrown in or rendered by the actors). If photographers would cultivate that more, they would immensely raise the status of their profession in the art direction, and lay claim to be next to the draughtsman in their ability to compose.

I have never yet seen, nor read of, any distinct definition or limit of the province of photography in relation to its application of artistic work, which it professes to take up. So far as I can make out, from what I see in its operation, it lies between the art of painting or drawing and dramatic or stage art. The former is called a fine or creative art, because of its influence to be entirely at the disposal of the artist, entering upon the treatment of his subject by choosing and rejecting at his pleasure that which is most suited to his necessities and wants, entering also into such niceties of feeling, subtle and delicate, especially in manipulation of drawing and colour. Some of these arrangements (as I have shown to-night) may be done by the photographer, but his power is comparatively limited, owing to his dependence on the lens (which draws for him). What he must do is the exercise of his judgment of the standpoint of the camera, construct his arrangement of subject, and develop. This is a great deal, but beyond that he is walled in. It is not his province to paint, neither on the negative nor on the print (excepting for defects purely incidental); the moment he does so he leaves his domain, converts his work into a mongrel, and renders his special art impure. It was certainly a retrograde movement when photography had recourse to the brush and other instruments (to meet the wishes of a vain and ignorant public), by touching up and remodelling the human face, destroying much that is valuable in likeness and character, making the production no longer authentic or valuable for reference in years afterwards.

Photographic art is distinguishable from all others in that its representations are, and ought to be, pure reflections in their ultimate issue, not manipulations; and the only credit the photographer can take, so far as art is concerned, lies in the skill with which he can conceive and arrange pictorial effects, apart from appliances beyond his sphere, such as the manipulation of composite negatives.

These are my views on this part of my subject regarding legitimate means for constructing pictorial effects and arrangement. It may be considered a mere matter of taste and opinion which I set as to the *modus operandi*. Well, I have given my reasons, and reiterate that I wish to see photographic art clearly defined from other branches, that no means be employed to lower the worthiness of what I conceive to be legitimate artistic effort, and that its special art—by simple reflection—be kept pure and as severe as possible.

I have no objections to any treatment by light on the subject proper, or on prints. This is analogous to the methods employed by the printer of etchings. There is the etching proper, but by the skill of the printer, under the direction of the etcher for completed proof, he shades certain parts by more ink being left on the surface, or keeps other parts very clean where brilliancy is required. Much may be done towards such an end in photographic printing, and I have no doubt is done, which I regard as legitimate work, because it is done purely by light.

Although double printing is almost universally employed, still I regard it as a do no better. The want of some appliance was felt when clouds and landscape could not be taken simultaneously, but now that sky-shades can be adjusted to the lens, such as my friend Mr. Parker's, of Glasgow—so thoroughly controlling the light on the sky while the landscape is being exposed first—every one who has seen his production must

feel that double printing is unnecessary. Certainly it is very tempting for composition purposes, that by choice cloud effects you can introduce lines that have a beneficial effect in composing with the landscape, yet all this is a part of the same cobbling which I complain of, and infinitely better would it be were you to bide your time and catch favourable clouds as they appear in conjunction with the landscape. Should you be pushed for time, and no clouds present when the plate was exposed, then, when the subject is printed, tone in, and graduate a sky by the influence of light over the surface, which would represent and give the feeling of a pure sky. It is to be feared that much of the indulgences in extraneous appliances is the result of doing the work by the easiest methods, irrespective of truth and taste. If there be difficulties in any department, let us fight with them, and not resort to spurious methods because they happen to be easier or more convenient.

I have always regarded photographic art and its requirements as being more allied to dramatic art than to that of fine art. For the construction of a scene, having several figures in it, see how carefully the arrangement of them have been made by actors, each individual, each group of figures, varying in position and action, and this every night reproduced because the subject has been fully felt and understood. I do hope the day is not far distant when stage effects may be photographed. Indeed, it would be worth the effort if rehearsals were made in the open air, under sunlight, and during the course of action instantaneous impressions taken; it would not only be valuable and serviceable for actors, but for all interested in dramatical and pictorial art.

In conclusion, let me earnestly urge upon all desirous of entering on this study, either from external nature or the human figure, to begin by making simple efforts on the principle of these *forte* points which I have illustrated. Have the camera focussing glass divided into odd numbers—say five or seven—and very soon you will be able to discover their value and suitableness to any subject. I humbly trust the critiques I have made on the pictures brought before you may have been suggestive and profitable, and that nothing which I have said, either on the pictures or otherwise, may have been the least offensive to any of the originators.

NORMAN MACBETH, R.S.A.

Department for Inexperienced Photographers.

SILVER PRINTING.

The above title is very comprehensive, inasmuch as there are quite a variety of methods by which silver printing may be performed. That to which we shall confine ourselves in the present article is silver printing on albumenised paper.

Albumenised paper is simply a fine quality of paper, one side of which is heavily sized with albumen in which has been beaten up a certain proportion of a chloride, such as that of ammonium. The object of the albumen is mainly to keep the picture on the surface, thereby ensuring brilliancy, for without it the photograph would be produced in the body of the paper and have a sunken, lack-lustre appearance. The object in adding the chloride is to cause the formation of chloride of silver, which is very sensitive to light, more especially when in contact with organic matter such as albumen.

An albumenised paper is now so readily and cheaply procured in commerce, and is prepared of so great excellence, it is not expedient that private consumers attempt its preparation. It is rendered sensitive by floating it for two to three minutes upon a solution of nitrate of silver in water. There is always a certain best strength of this solution, but unless one knew definitely the proportion of salt that has been mixed with the albumen, its determination is left very much a matter of doubt. For example, some albumenisers salt their paper so lightly that a silver bath containing thirty grains of nitrate of silver to the ounce of water suffices; but in the absence of definite instructions it will be found advisable to employ a solution rather exceeding, but not under, fifty grains in strength.

Having poured a sufficient quantity of such solution into a flat porcelain or glass bath, take up the sheet of paper by opposite corners, so as to form it into a curve, and place it neatly down on the solution, so as to prevent any air bubbles forming on the coated surface, or any of the silver solution to flow over its back. This must be done in a feebly lighted room, one by preference into which the light is admitted through yellow paper. Gas or candle light does not exercise any bad influence. In course of its duration on the solution the paper should be raised up by one corner by means of a pair of horn forceps, and examined to see if it is all uniformly wetted. In about three minutes it must be raised up and drawn over the edge of the dish in order to get rid of the superfluous silver solution, and then suspended to dry. This may be done either by wooden spring clips (American clothes clips), or by laying it, back down, over a stout cord stretched across the room. Pieces of blotting-paper should be placed underneath so as to absorb the drippings, and these

should afterwards be placed away so as to have the silver recovered from them.

When quite dry, the paper is ready for cutting up and being printed upon.

Let the printing be carried much farther than it is desirable it should appear eventually, as by the toning and fixing operations the print becomes somewhat reduced. After the printing has been done, place the prints, one by one, in a dish of water, each being allowed to become quite wet before the next is added. This removes most of the free nitrate of silver, which is considerable. The first washings ought, therefore, to be preserved, as the whole of the silver can be recovered, which materially diminishes the cost of outlay. The washing water ought to be changed two or three times, but it is scarcely necessary to keep any but the first washings.

The prints are now transferred, one by one, to the gold toning bath. The acetate toning bath is that which will be found most generally useful, because after it has been made it retains its good working qualities for a long time, whereas some others will not keep good over one day. The acetate bath derives its name from the chloride of gold being placed in solution along with acetate of soda, and it is better that the bath be allowed to stand at least one day after its preparation before being used for the first time. A reliable formula is—

Acetate of soda	30 grains.
Chloride of gold	1 grain.
Water	8 ounces.

After the prints are immersed in this, they will slowly pass from a rather unpleasant red tone to a violet, and afterwards a cold blue colour. As soon as they are seen to pass from the purple to the blue tone, remove them and transfer them, without washing, to the fixing bath, which consists of four ounces of hyposulphite of soda to a pint of water. In this bath they may be allowed to remain seven or eight minutes. Both in the toning and fixing baths precaution must be taken that the free action be favoured by keeping the prints in motion, and not permitting two of them to stick together, as this will cause inequality of the toning action.

After remaining for the time mentioned in the fixing bath, lift up the prints and examine each one by transmitted light, when a peculiar translucence will indicate whether the chloride has been quite dissolved out or not. Should such translucence not appear at first, return them to the hyposulphite solution for one or two minutes longer. It is inattention to the prints at this stage that is the main cause of their fading in after years.

Next place the prints in water, very frequently changed, until the hyposulphite of soda is thoroughly removed from the interstices of the paper. Some printers are so expert as to be able to ascertain this by the application of the tongue to the print, for if the soda be still present there will be a peculiar saline taste. It is well to wash them considerably beyond this stage so as to make sure. Next spread out the prints upon clean blotting-paper and remove the excess of water, afterwards hanging them up or laying them out upon a clean towel till dry.

We shall resume our remarks on this subject next week.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 2736.—“Improved Means for Attaching or Detaching the Tripods or Supports of Photographic Cameras.” H. BOLDEN.—*Dated February 22, 1887.*

No. 2737.—“Improvements in Camera Stands or Supports and in Means for Attaching Cameras thereto.” H. BOLDEN.—*Dated February 22, 1887.*

No. 2748.—“Improvements in Photographic Camera Stands.” Communicated by E. CAHIX-Toussaint. M. O. HUND, trading as SAHL & Co.—*Dated February 22, 1887.*

No. 2803.—“An Improved Back for Photograph and Mirror Frames.” W. D. WILKINSON and F. FOWLER.—*Dated February 23, 1887.*

No. 2891.—“Improvements in Photographic Albums.” C. LUNN.—*Dated February 24, 1887.*

No. 3096.—“Improvements in Photographic Cameras.” J. E. BROWN.—*Dated February 28, 1887.*

Is tobacco smoking in the dark room injurious to the progress of the developing of plates? asks the *Photographic Times*. One of the answers given to this question asserts that cases are on record, when negatives which had been developed without the presence of tobacco smoke had neither suffered any injuries, nor had they been improved. It is not reasonable to believe, however, that tobacco smoke will exercise no influence upon sensitive substances. The magic photographs inserted in cigar holders are developed by smoking. We are well aware of the nature of these photographic toys, but cannot dispute the fact of their development. Smoking in the dark room must have some effect; and as there is the chance that it is injurious, besides increasing the risk of a fire would it not be better to dispense with it here?

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
March 7	Notts	Institute, Shakespeare-street.
" 7	Blackburn	
" 8	Great Britain	5A, Pall Mall East.
" 8	Newcastle-on-Tyne & N. Counties	Coll. of Physical Science, Newcastle.
" 8	Manchester Amateur	Masonic Hall, Cooper-st., Manchr.
" 8	Derby	Sykes's Restaurant, 33, Victoria-st.
" 8	Bolton Club	The Studio, Chancery-lane, Bolton.
" 9	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 10	Birkenhead	Free Public Library, Hamilton-st.
" 10	Bradford Amateur	Grammar School.
" 10	Cheltenham	4, Clarence-street.
" 10	Halifax Photographic Club	Mechanics' Hall.
" 10	Manchester Photo. Society	36, George-street.
" 10	London and Provincial	Mason's Hall, Basinghall-street.
" 11	Ireland	Royal College of Science, Dublin.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

On Thursday night, February 24, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. F. W. Cox presided.

Mr. H. M. HASTINGS had taken home a piece of one of the white mounts spoken of by Mr. Henderson at the previous meeting as having been tested by him. He (Mr. Hastings) had taken off the three outermost layers of the card, then dipped it in litmus; it went a deep red colour, being distinctly acid. He exhibited the reddened card to the meeting.

Mr. A. L. HENDERSON remarked that he had stated that all the mounts might not be alike.

Mr. A. HADDON said that Mr. Henderson by boiling pieces of the mount in water might have boiled out a volatile acid.

Mr. E. C. CONRAD thought any acid in paper to be likely to be sulphuric acid, as that was generally used in the manufacture.

The adjourned discussion upon Mr. Hubert's paper upon collodio-chloride printing then took place.

Mr. J. HUBERT exhibited various lantern slides he had prepared by the collodio-chloride transfer process; he had found it, he said, necessary to print rather deeply to produce them. He also exhibited a variety of collodio-chloride prints upon opal glass and paper.

Mr. J. TRAILL TAYLOR, in making a few remarks on the paper read by Mr. Hubert at the previous meeting, and on some of the statements made by that gentleman in course of his demonstration, first alluded to a claim made on behalf of the printing paper then exhibited, that, unlike albumenised paper, it did not expand when placed in water. In order to test this, he (Mr. Taylor) had taken the identical sheet of paper handed to him by Mr. Hubert, and having cut from it a slip of the precise length of nineteen and three-quarter inches, had placed it in water for half an hour, when, upon again measuring it, it was found to have expanded to twenty inches and one-eighth. This fact he considered fatal to the claim made by Mr. Hubert, that the paper in question was quite free from the expansion by which albumenised paper was known to be characterised, as in this respect both were alike. Again, Mr. Hubert appeared to be pervaded by the idea that in bringing before them collodio-chloride paper he was showing them something new, whereas it was well known to most of them present, having been originally introduced by M. A. Gaudin in 1861, and reintroduced by Mr. Wharton Simpson in 1864, about which time it had been brought prominently before the world, more particularly through the Photographic Society early in 1865, where formulæ had been given and specimens exhibited. Many experimentalists had at that time contributed their quota to the perfecting of the process, among which the sulphocyanide toning bath, advocated at last meeting by Mr. Hubert, had been published by the late Mr. Henry Cooper over twenty-two years ago. One of the most important improvements made upon the original formula emanated from Mr. W. T. Bovey, who at that time (1865) was an assistant in the employ of their brother member, Mr. Prestwich; it consisted in the addition of an organic acid—citric acid by preference—by which this system of printing became applicable direct to porcelain or opal plates. Perhaps the most daring improver of collodio-chloride was W. Terry, of America, who added the fulminating compounds of silver to the emulsion with an alleged marked advantage. The addition of a few drops of the supernatant solution of strong ammonio-nitrate of silver or oxide of silver dissolved in nitrate of ammonia, to which alcohol was then added and heated to the boiling point, to even a bad emulsion of collodio-chloride had by Terry been found to impart wonderful properties of fine colour and brilliance. Still others had rung the changes upon the various chlorides which were more or less soluble in alcohol. Among these were those of cadmium, calcium, cobalt, lithium, magnesium, and zinc, which were all readily soluble in that menstruum, those of ammonia, barium, sodium, and strontium being soluble in an inferior degree. As Mr. Hubert appeared to attach importance to the novelty as well as the utility of multiplying negatives through the agency of collodio-chloride, he was rather sorry to have to disillusionise him also on this point. In 1869 paper prepared with collodio-chloride for this express purpose was a regular article of commerce in London, and in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1870 would be found an article on multiplying negatives, by the speaker, in which were given directions for reproducing a negative in substantially the same language as that employed by Mr. Hubert last week; and the late Mr. Baden Pritchard had brought this application of the emulsion before the Photographic Society, although, for some reason unknown to the speaker, he soon afterwards discontinued its use, as did Mr. Jabez Hughes, who had made extensive preparations for working it. The whites were doubtless free from the organic salt of silver which would be found in those of albumenised prints when Mr. Spiller's suggestion of removing it by ammonia was neglected, but

in other respects collodio-chloride prints were as liable to decay as albumen prints.

Mr. HENDERSON thought it curious that a collodionised paper should have expanded to the extent mentioned by Mr. Taylor without curling.

Mr. TAYLOR had spoken of the baryta-surfaced paper before the collodion emulsion had been put on it; the paper did not expand equally in all directions; the other way it expanded about one-eighth of an inch.

Mr. HUBERT remarked that his prints did not curl in the baths to any marked extent when he worked the process at the previous meeting.

Mr. HENDERSON felt certain that collodion prints contained traces of organic salts of silver in the whites; in 1865 he had sealed some collodio-chloride prints against glass with Canada balsam, and the beautiful purple tones had disappeared in course of time. Collodion was a good preservative of pictures, provided that care were taken to choose a sample without an acid reaction, and it was especially good when mixed with varnish. Simpson's formula was good in the selection of non-deliquestent salts.

Mr. HADDON wished to know how long the emulsion would keep and how long the paper would keep with proper care, also whether it would give the same range of tones from red to blue as with albumenised paper. Why not print direct upon an opal plate by the collodio-chloride process?

Mr. TAYLOR said that when Henry Cooper introduced sulphocyanide toning in 1865, he dwelt specially upon the fact that the progress of the toning action in the print must be viewed by transmitted light.

Mr. J. J. BRIGNSHAW thought the sulphocyanide toning bath to be a very strong one.

Mr. HUBERT said that it was made from Obernetter's formula, and not that of Dr. Liesegang.

Mr. MEDLAND asked whether Dr. Liesegang had coated glass plates for contact printing.

The CHAIRMAN asked if the high gloss could be removed from the prints without injuring them.

Mr. J. B. B. WELLINGTON believed the process to be hardly suitable for lantern slides, because they could not be printed by artificial light, and even by daylight could only be produced by contact printing.

Mr. A. COWAN said that a flexible film gave good contact with the negative, and that was an advantage of the transfer process.

Mr. HUBERT turned out about one hundred and twenty prints a day, and had a quick eye for unequal expansion of papers; he had not noticed it with Dr. Liesegang's. That the paper expanded before it was coated with collodion was no proof that it did so afterwards. No, the process was not perfect when it was first brought out, and perhaps it might be followed up now. Dr. Liesegang used a trebly-gummed paper for transfer purposes.

Mr. COWAN said that gum or some similar substance had been used before.

Mr. HUBERT remarked that if gelatine had been used instead of gum it would not have been suitable.

Mr. W. M. ASHMAN said that Mr. Bruce, of Duose, Scotland, had worked the process steadily for twenty years, and was doing so now, he believed.

Mr. COWAN stated that the carbon process could be worked with equal ease.

Mr. HUBERT objected that then the progress of the printing could not be watched.

Mr. ASHMAN was aware that Mr. Baden Pritchard gave up the collodio-chloride process because carbon transparencies were more easily made.

Mr. HUBERT believed that amateurs would find it easier than the carbon process. In working the latter experience was necessary; besides, collodio-chloride emulsion would keep a considerable time, and be always at hand to turn out a print when wanted.

Mr. G. GLANVILLE had tried the process, but found that the beautiful tones passed away after a few years, and then the prints looked worse than those upon albumenised paper; moreover, the obtaining of fine tones cannot always be depended upon; sometimes the prints came out of a greenish colour.

Mr. HUBERT had met no such difficulties in toning. In testing for permanency, when the albumen print had entirely vanished in the solution the collodio-chloride print had not been visibly attacked by the cyanide of potassium, and he did not see why the protection of the image should be ascribed to the porous collodion.

Mr. TAYLOR said that the collodion resisted permeation. The really fatal thing was the internal elements of decay in the print itself.

Mr. HUBERT responded that Captain Abney had collodio-chloride prints which had been kept under a variety of conditions since 1869, and were still as good as ever; not one of them had altered in colour or in the purity of the whites. Persons had failed with the process, but then some operators were not as good as others. Collodio-chloride prints had been exposed outside his house under similar conditions to albumenised prints which had been properly toned, fixed, and washed, and the later prints had in the course of a winter and summer exhibited beginnings of decay, but the collodio-chloride prints had not done so.

Mr. TAYLOR had seen certain albumenised prints exposed in a New York show-case in 1879 which were in the same good condition when he saw them again a few months ago, and New York had a more trying climate than Hackney.

Mr. HUBERT responded that New York was dry and Hackney was damp, and damp was a great enemy to photographs. Chloride of strontium was sparingly soluble, and chloride of lithium was very soluble in collodion. Moreover, because of its very low combining number, lithium would carry a great deal more chlorine than an equal weight of most other metals. Dr. Liesegang said that the reason why his paper did not curl was, that he coated it while it was tightly stretched upon a frame, and then he dried it quickly. He (Mr. Hubert) had tried a few experiments, and found that the use of two drachms of glycerine to the pint of emulsion greatly reduced the curling propensities. He thought that he could tell how ordinary paper was prepared to take emulsion, but would not do so that evening. He had printed direct on glass by the process, but then the progress of the printing could not be watched so easily, unless a special printing frame were used. He stated that any range of tone can be obtained with the sulphocyanide bath; the acetate bath does not work so well, and requires deeper printing. He believed that he should

always keep the collodio-chloride process more or less in use, and that by it he could depend upon turning out a hundred successive proofs without a failure.

A vote of thanks was unanimously accorded to Mr. Hnbert.

The question was asked, "Should not photographers protect themselves against firms working enlargements for the profession, and exhibiting same as their own work and as photographers to the public, thereby obtaining business by selected works of those who support them, at prices far below those of professional photographers?"

Mr. ASHMAN said, "Boycott them."

Mr. COWAN thought that no firm acted as stated.

Mr. GLANVILLE knew that it had been done, and such firms had the pick of the work of the very best photographers.

Mr. HENDERSON considered that such action would be a betrayal of confidence.

Mr. ASHMAN believed that the system had long existed.

Mr. GLANVILLE recommended that work should be withdrawn from such photographers.

Mr. CONRAD said that the enlargements were the own work of the photographers in question.

Mr. COWAN remarked that Mr. Haddon had said nothing, but he knew what Mr. Haddon was thinking. Mr. Haddon was thinking that photographers who had enlargements done for them by others often exhibited them and charged for them as their own work, and probably the picture had been worked up to something far better than the original negative would naturally give. The argument cut both ways. Mr. Haddon thought that photographers should make their own enlargements.

The proceedings then closed.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting was held in the Technical School, Bridge-street, on Thursday, February 24,—Vice-President J. W. Harrison, F.G.S., in the chair.

The minutes of the last meeting having been read and confirmed, Messrs. Hoskins and Leeson were duly elected members.

In answer to a question, Mr. A. PUMPHREY said four-inch condensers were the best size to use in lantern work; and as to the question, "What is the exact position to place the diaphragm in the lens?" Mr. E. C. MIDDLETON said experience should decide. Mr. B. KARLESE recommended the perusal of Dallmeyer's book on lenses, which gave precise particulars on the subject.

The Lantern Committee gave their report on the results of the prize competition.

The next business was the development trials. Four plates each of Ilford ordinary and rapid were exposed in Warnerke's sensitometer, and developed with pyro and ammonia, oxalate, an American developer, and Beach, by Messrs. Delicate, Nock, Middleton, and Pickard, the results as to speed of developing being respectively Beach, pyro, American, oxalate. The rapidity of the plates shown by the numbers of the sensitometer showed nearly as high on the ordinary as on the rapid; in fact, one seemed as good as the other. On showing the plates in the lantern, those developed by Beach and pyro were denser in tone, and those by oxalate and the American developer rather better balanced gradations.

After some discussion, and an exhibition of a number of lantern slides brought by members present, the meeting was concluded.

The next meeting is on March 10, when the American slides lent by the Camera Club will be exhibited.

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

THE ordinary meeting was held in the College of Science, Newcastle, on Thursday, the 10th ultimo,—Professor Herschel in the chair.

After the usual routine business, Mr. J. PIKE, the Hon. Secretary, read some notes on *Orthochromatic Photography*, and showed some specimens of work. At a recent meeting, during the discussion on orthochromatism, Mr. Pike suggested collodion as a solvent for the dye used, eosine, or erythrosine, &c. He had since made what he called orthochromatic collodion, with which an ordinary gelatine plate was coated, dried, exposed in the camera, and developed in the usual way. They have answered very well, and the plate was rendered more sensitive to gaslight. To get the best orthochromatic effect it was necessary to use yellow glass behind the lens. The gelatine plates used in conjunction with the collodion were the Ilford, and Mr. Pike said he could confirm Mr. Leon's statement as to the rapidity of these plates even compared with those prepared and tested by gaslight.

A discussion followed, Messrs. Herschel, Gibson, Sawyer, Downey, and others taking part.

The next meeting will be held at the Literary and Philosophical Society's Institute, the occasion being the lantern slide competition.

CAMERA CLUB

THE meeting on Thursday evening, February 24, gathered to hear and discuss a paper sent by Mr. J. F. Mostyn Clarke, entitled *Art and Photography—Portraits*. In the absence of the author, the paper was read by Mr. W. A. Greene. Mr. D. P. Rogers occupied the chair.

Previous to the paper of the evening being read, Mr. W. K. BURTON, by the desire of some of the members, brought up the following subject:—He said it was known that a most unwarrantable attack had been made in one of the photographic papers (*The Amateur Photographer*) upon Mr. J. Traill Taylor, in connection with the address he had delivered at the Camera Club Conference. Some indignation had been felt at the reflections cast upon Mr. Taylor personally, and in regard to the paper he had read. In consequence, a letter had been written and signed by such members of the Committee as were available

at the time. This was sent to the paper in question, but was refused insertion, and it was now considered desirable for several reasons that it should be read at one of these meetings of members. Mr. Burton then read the letter, which ran as follows:—

Camera Club, 21, Bedford-street, W.C., February 15, 1887.

SIR,—We, the undersigned members of Committee of the Camera Club, request the insertion of this letter in your next issue to protest in the strongest terms against what we consider the unwarrantable attack made upon Mr. J. Traill Taylor in the account of the proceedings of the Camera Club Conference, contained in your last number. Mr. Taylor was specially asked by the Committee to read a paper at the Conference, and, far from thinking that the Camera Club was "slighted" by the paper he did read, we consider that he brought before the meeting, in a thoroughly practical manner, matters of real importance to amateur photographers, the solution of the difficulty of enlarging with ordinary coal gas, and without expensive apparatus. There was nothing that could be likened to the manner of a manufacturer's representative in the way in which Mr. Taylor brought forward the subject.—We are, Sir, yours truly (signed), GEORGE DAVISON, W. K. BURTON, W. H. HYSLOP, A. R. DRESSER, E. FERRERO, JOHN B. CAMPBELL, H. J. GIFFORD, WASBURY GREENE, J. FRANCE COLLINS, D. P. RODGERS.

The meeting having heard the letter, agreed in the advisability of including it in the reports of the proceedings.*

On a call from the CHAIRMAN for objects of interest, Mr. Gifford exhibited a new three-fold stand, and Mr. W. K. Burton showed some interesting examples of reversal of image sent to him by Mr. Lewis, of Hove, Brighton. By exposing an ordinary dry plate for a few seconds to diffused daylight under a negative, and then developing in the usual pyro developer, a negative nearly as good as the original was obtained.

Mr. A. R. DRESSER stated that by long exposure he had produced, with a dry plate, a positive from a positive without development, but doubts were entertained as to the accuracy of this statement.

Mr. Rodgers showed three interesting photographs done by Mr. Blanchard from twenty to thirty years previous. One, a silver print, having shown signs of fading, had been treated with mercuric chloride, and had stood unchanged ever since. Another was mounted on card with a lithographic tint, the character of this surface being, perhaps, accountable for the perfect preservation of the photograph, which had undergone trying treatment and exposure to damp. The third was a carbon print, also in a perfect state of preservation.

Mr. W. ASBURY GREENE then read the paper on *Portraiture*, sent by Mr. Mostyn Clarke [see page 135], calling attention at commencing to the following additional introductory remarks sent by the author:—

I am very conscious, in attacking and endeavouring to treat with brevity and simplicity so vast a subject as art—even in its relations to photography—how inadequate the work done must be; but my object is not to accomplish the work myself, so much as to enlist the thought and study of others. I allude to the introducing among photographers higher knowledge and standards in art than at present exist. Photography is the means—or might be the means—of making art possible in many a home where greater works, even in black and white, are now an impossibility. The existing state of things—perhaps I ought to say, as I see it—is anything but satisfactory. Why does one turn away in despair from the majority of photographic windows, and from a large proportion of the pictures in our exhibitions? Because of a violation of the laws, often the earliest and simplest, resulting from a want of true feeling in art in some, and more frequently through imperfect study. The want of artistic excellence in pictures, it is fair to say, is often due largely to the nature of the papers upon which they are printed; for example, how much real feeling can be given to albumen prints—a most unsympathetic medium from an art point of view? Then platinumotype, possessing most qualities wanting in albumen, is in the hands of all, save a few, sadly wanting in warmth of tone. Again, looking to the quarters where excellence is, we find it with men whose work is not given to the public, except in a very few instances; thus failing to touch the source of existing evil. To be personal: I have attempted to begin the alteration of this state of things in two ways; one, by the formulation of art elements; the other by technical improvements in the printing of results. Of the former the paper to-night is a part, and I venture to hope that the work I have endeavoured to begin will be seriously continued by others, and will be taken up by some of those amongst us who are far more competent to complete the task than I myself am to commence it.

In discussion, Mr. S. B. WEBBER thought a reflector was of great importance, but it was possible to have too much of a good thing. It was not pleasant, after using a looking-glass or a reflector, to find a portrait of yourself and camera included in the particular picture you were taking.

Mr. W. TOMLINSON had read it suggested in some art journal that photographers would find success easier in groups than in single portraits, because some at least came out well, and were satisfied.

Mr. F. G. SMENS had taken his own portrait by setting the camera before he went to bed at night, so that he was being taken before he awoke. The feeling that the photographic eye was upon him prevented him sleeping, and at seven he rose and put the cap on, exposing again later on. He expected to come out twins, but the photograph was not bad, only a little corpse-like.

Mr. G. DAVISON criticised the examples sent by Mr. Clarke as to composition and expression, and asked Mr. Burton what were the difficulties in the way of obtaining plain non-albumenised sensitised papers.

Mr. BURTON said the plain sensitised papers could not well be preserved, but must be used freshly made. They were also difficult of preparation. He thought the ammonio-nitrate process the only suitable one. He considered that Mr. Mostyn Clarke's paper was a very valuable one, and that his portrait examples showed much skill.

Mr. A. DEED suggested a special exhibition, no retouching to be permitted. Mr. E. FERRERO believed portraiture not worth anything without retouching, because of defects, such as freckles, &c., being intensified in photography.

* In order that our readers may understand this matter, we may explain that some one connected with the contemporary named, apparently ignorant of the fact that an enlargement could be made by means of common gas, wrote in it a silly paragraph of a somewhat personal nature. As an erroneous opinion was entertained by a few that the journal in question was in some way or other the organ of the Camera Club, or, at any rate, in rapport with it, the Club lost no time in repudiating a connection which, if it ever existed, certainly has no existence now, and of which the leading members have expressed a feeling of shame, not only now, but also at the award of the promoters of the contemporary that "no dry scientific details" of photography would ever find a place in its pages. The Camera Club now has its own organ, issued monthly to its members, and it, together with the Club itself, has its own best wishes for its continued prosperity.—EDS.

Mr. BARCLAY had heard it affirmed that if the plate were exposed through the glass back these defects were overcome.

Mr. J. J. ROBERTS had not been satisfied with his results at portraiture on orthochromatic plates by artificial light.

Mr. ROGERS thought albumenised papers suitable for portraiture and the glass a distinct advantage for small sizes. He would glaze these highly—treat them as gems—to get all the light possible into the details. "Lighting was a very great point in portraiture, and he had found the best reflector to be a large white cardboard placed as near as possible to the sitter without being in the field of vision of the lens. With a looking-glass as reflector he had got a double set of shadows. Referring to Mr. Barclay's remarks, he would observe that taking the portrait through the back of the plate would give a reversed picture in the print. The two sides of the face were never alike, and the nose never in the middle of the face. He had been very well pleased with the behaviour of orthochromatic plates in taking portraits by gaslight.

Mr. H. J. GIFFONN referred to the necessity of having the surroundings suitable to the subject if it were intended that the portrait or figure study should also be a picture.

On March 10 Mr. Norman Macbeth, R.S.A., will deliver a lecture on *The Composition of the Pictorial*, with lantern illustrations.

BOLTON PHOTOGRAPHIC SOCIETY.

ON Wednesday evening last week, the fifth annual *soirée* of the Bolton Photographic Society was held in the Baths Assembly Room, Bridgenian-street, when the attendance of members and their friends numbered about four hundred. The walls were hung with photographs taken by members of the Society.

The PRESIDENT announced that the prizes had been awarded as under:—No. 1 Competition, "Photographs taken during the season," 1, Mr. E. N. Ashworth, Turton, *Norwegian Carolee*; 2, Mr. C. K. Dalton, *Old School, Winwick*. No. 2 Competition, "Photographs taken at any outdoor meeting of the Society in the past season," 1, Mr. C. K. Dalton, *Boat House, Worsley*; 2, Mr. William Laithwaite, *Whalley Abbey*. No. 3 Competition, "Transparencies," 1, Mr. Jabez Boothroyd; 2, Mr. W. Laithwaite.

Mr. B. H. ABBATT, the Secretary, read the annual report, which regretted that the Council could not congratulate the members on an increase of the Society, but its finances were still satisfactory. During the summer months open meetings had been held at several places, and the operations of the Society had been very successful.

Over a hundred views were then thrown upon the screen by Mr. J. H. Leach, while Mr. R. MERCER described the pictures.

The proceedings were enlivened with music by the members.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held on Thursday, February 24, at the Royal Institution,—The President, Mr. George H. Rutter, in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. James Lahy was unanimously elected a member of the Association.

The SECRETARY read a letter from Miss Calder, Hon. Secretary of the Re-creative Evening Classes Association, asking the assistance of members of the Association in making a series of lantern slides from photographs or drawings illustrative of the reign of Queen Victoria, with special reference to the Jubilee year.

Mr. Lange showed a very fine enlargement in gelatino-bromide of two dogs.

Mr. Atkins exhibited a print which eighteen months ago had been fixed in hypo in the usual way and then merely rinsed in water and dried without any washing. The print was in apparently as good condition as it ever had been, showing no appearance of fading through leaving the hypo in.

The Secretary exhibited a number of whole-plate negatives on Eastman films taken during his visit to Norway last August; also some attempts at collotype taken on an autotypist by floating the gelatine sheet on potassic bichromate solution, printing when dry under a negative, and, after soaking in water, printing with an ink roller.

Mr. LANGE also showed and explained the use of the "gelatine skins" for Eastman's "stripping films," and Dr. Kenyon showed a negative mounted on the gelatine film.

Mr. J. E. Thornton, of Manchester, then exhibited his patent Jubilee camera, tripod, and roller slide.

Mr. GEORGE H. RUTTEN then read a paper on *Odds-and-Ends*. He referred first to the various makes of films, exhibiting specimens of Stebbing's, Warnerke's, and Pumphrey's improved films; he also showed the carriers of Messrs. Warnerke, Pumphrey, and Morgan & Kidd. He next mentioned the desirability of being provided with several convenient pieces of minor apparatus on a tour, instancing a compass, view meter (of which he showed specimens of Harvey Barton's and one on the principle of a monacle opera glass, also a combined focuser and view meter), and bayonet joint fitting to the lens. He then gave an account of some experiments to ascertain the value or otherwise of various baths preparatory to development. He exposed Eastman paper films upon the Atkins's sensitometer, which consists of gradually increasing thicknesses of tissue-paper mounted on a large sheet of glass, so that it can be placed in a window; the small stop of the lens was used, and five seconds was the exposure. Four exposures were made as rapidly as possible, and then each plate was cut into two, making eight pieces, and were divided into two lots, one to be developed with ferrous oxalate and the other with pyro. The first of each lot was dipped for one minute in a fifteen-per-cent. solution of common table salt, the second one minute in a half-per-cent. solution of hypo, the third in half an ounce of the American standard alkali solution in three ounces of water, and the fourth received no preparation. They were then developed for five minutes, fixed, and washed, and the results exhibited to the

meeting. Mr. Rutter then referred to Herr Göllicke's article in the *Photographische Mittheilungen* on a preliminary bath of very weak hypo. His conclusions were that the sensitiveness of the plates is not increased, but the time of development shortened, which result seems to be confirmed by Mr. Rutter's experiments.

Mr. W. A. WATTS read *A Few Words on Orthochromatic Photography*. He said he had no intention of producing a paper, as his experiments had not been sufficient nor successful enough to warrant his doing so; but when he found the meeting was to be disappointed, through illness, of a promised paper, he thought a short account of his attempts might fill the gap. He had met so far with very little success, due, firstly, to endeavouring to work without a yellow screen, and, later, to the want of keeping powers in the sample of commercial plates he was trying. This was said to be a fault in all the commercial plates, but Mr. B. J. Edwards had stated his plates would keep for twelve months. He next tried dipping some plates in a bath of eosine and drying, and found that with the yellow screen the exposure was increased about twelve times; and although there was no very decided orthochromatic effect, the negative and print therefrom compared with those obtained with a plain plate seemed to have gained immensely in vigour and contrast. He next referred to the processes published by Messrs. Hyslop and Wellington for dipping in a bath containing erythrosine and silver, and expressed the fear lest these processes should be held to interfere with Messrs. Tailer & Clayton's patent. He advised members desirous of experimenting to try Ives's chlorophyl process, of which he gave some particulars.

Mr. A. W. BEER moved a resolution, which was carried, that the various photographic journals received by the kindness of the several editors be placed in a protecting case and laid on the table at each meeting.

HALIFAX PHOTOGRAPHIC CLUB.

THE monthly meeting was held on the 24th ultimo in the Mechanics' Hall,—The President, Mr. Councillor Smith, in the chair.

Two new members were elected and another nominated.

There was a large attendance of members, and a very instructive evening was spent discussing the claims of platinotype, the Eastman broadie paper, and carbon, to be permanent processes. The matter being of great interest, it was decided to take a whole evening for the separate discussion of each process, Mr. George Hepworth to give a paper and demonstration of *The Platinotype Process* on March 24; Mr. B. Rowley, *The Eastman Process*, on April 21; and Mr. W. Clement Williams, *The Carbon Process*, on May 26.

After some expression of opinion in reference to the use of a preliminary bath of weak hypo to development of under-exposed plates, it was thought to be of little or no practical utility, and although prominence was being given to the subject in some quarters just now as something new, it might be classed as a rediscovery of an old method.

There were some sample negatives from orthochromatic plates laid before the Club alongside with similar subjects taken on ordinary plates. The chief advantage seemed to be in the rendering of the blue and violet, and very little gain, "if any," in yellows and browns, the test being a graduated and numbered range of colours supplied by a Berlin wool pattern card.

Correspondence.

✉ Correspondents should never write on both sides of the paper.

AMATEURS AS ARTISTS.—LENSES.

To the Editors.

GENTLEMEN,—I was much amused, and much more puzzled, on reading some remarks by Dr. Jacobs during a discussion at the Photographic Society of Leeds. He said, "The amateur has great advantage over the professional man in being able to invest his subject with artistic attractions." I think there are some professional photographers who have some knowledge of art. If not, perhaps Dr. Jacobs will kindly name a few amateurs to whom they could apply for lessons. I am sure there are some very clever amateurs, but by far the largest number have very little knowledge of how to make an artistic picture. He also says he "pities the fate of the professional, doomed to photograph the miserable specimens of humanity—the incarnation of ugliness." I am sure the professional must feel grateful to him for his sympathy, and will no doubt appreciate it highly; but I fail to see in what way he has such a fearful doom. Perhaps Dr. Jacobs will kindly explain. I am always anxious to gain information.

The other remarks of the Doctor with regard to the value of having several lenses on his Swiss tour are much more sensible. May I inform him that on my annual visit to that country I take about twenty lenses for the various sizes of negatives? For stereoscopic pictures I use three pairs of single landscape, two pairs of rectilinear, and one pair of rapid rectilinear. For cabinets and 9×7 negatives I find it necessary to take four single, two rectilinear, and three rapid rectilinear lenses. Of course all these vary in focus from three inches to twenty. One remark I may add, and that is when straight lines are not in the views, I always use single landscape lenses.—I am, yours, &c.,

W. ENGLAND.

St. James's-square, Notting Hill, W.

RETOUCHING.

To the Editors.

GENTLEMEN,—All employed as retouchers will agree with Mr. R. Barrett's remarks in last week's number of this JOURNAL, about the question, "How many heads has he done to-day?" and with your permission I should like to draw attention to another point concerning employes and employed relative to retouchers. You will generally see in advertisements the phrases, "Wanted, a retoucher; none but competent men need apply. Only those that can do best work," &c.

But are they willing to pay for competent men and best work? The wages usually paid are two pounds per week. Is this a sufficient remuneration for an artist (who in most instances is really the chief means of making the business pay)? He is expected to make every defect in the negative right, and is compelled to sit all the weary hours of the day trying to get on with the bulk of the work, and wondering how long his eyesight will last, to enable him to keep on with this tedious work. Would it not be only fair to pay competent men and for best work double the amount now given, and to state the salary in the advertisement?—I am, yours, &c.,

Liverpool, March 1, 1887.

OVER-WEARY.

T. R. WILLIAMS AND RETOUCHING.

To the Editors.

GENTLEMEN,—In the method of retouching by Mr. R. Barrett, page 117 of THE BRITISH JOURNAL OF PHOTOGRAPHY, he certainly makes a great mistake in stating that Mr. Williams retouched his negatives, and this brought him into vogue before other photographers began.

On the contrary, Daguerreotypes secured him royal patronage before he began collodion work. I distinctly remember the time when ladies of title daily flocked to his residence in Southwark to be photographed. This was before he built his West-end studio, and when he carried on his work of Daguerreotype slide making in an extemporised conservatory. I pointed out some time since to another correspondent that his success was in the lighting of his subjects, reflecting screens and blinds being freely used.—I am, yours, &c.,

H. J. GORFIN.

A DARK ROOM LAMP.

To the Editors.

GENTLEMEN,—I have for some months past been using a lamp which I designed for use in the dark room, and as I have found it very useful when travelling I have much pleasure in bringing it under the notice of your readers.

It consists of a lower portion about six inches in diameter and one inch in depth, the top, which is somewhat smaller than the bottom (so as to be contained in it when the lamp is closed), is connected with the bottom of the lamp by a spiral spring, one end of the spring being fastened to the top the other to the bottom portion of the lamp, and is surrounded on its outer surface with transparent material. I have found three thicknesses of yellow tissue-paper do very well.

When in use, and the spring expanded, the lamp, which is circular in shape, is twelve inches high and six in diameter. To close the lamp pressure is made on the top, the spring compressed, and the top is by this means brought into contact with the bottom, and is held in this position by some small fastenings. It then occupies a space of about two inches in depth and can be easily carried in a bag or portmanteau. I have arranged with Messrs. Wratten & Wainwright for the manufacture of this lamp, and it can be seen at 38, Great Queen-street, W.C.—I am, yours, &c.,

February 28, 1887.

AMATEUR.

LIMELIGHT MATTERS.

To the Editors.

GENTLEMEN,—A few words in reply to Mr. G. R. Baker. I am glad to learn that the price of gas in bottles is to be reduced, and presume the house gas will be reduced in proportion to fourpence, as its cost is almost *nil* against twopence per foot for making the oxygen. If so, that will bring the cost of twenty feet of mixed gas down to 8s. 4d., and will reduce the discrepancy, but a great deal will still remain. He does not really answer my question about the regulator, however. What I asked was not if it worked "perfectly" in any general sense, but this specific point: If I put it on a lantern and turn the jet *entirely off*, does the regulator still prevent any extra pressure passing it, or does it then gradually pass and blow off the pipe or burst it (unless strong and well secured)? I have seen several in my time, but all necessitated turning off at the valve if the jet was quite turned out, and what I wanted to know was, whether or not this regulator did the same.

I was not so discourteous as to question Mr. Baker's figures in any way, except in the modified sense that an operator need not necessarily spend so much on bag plant as was tabulated. If you use bottles, &c.,

you *must* buy everything; there is no choice. But many a lecturer has made his own boards. I said nothing at all about boards "first-class, with prop," &c., but merely upon the much simpler plan I described, and which I have proved to be most thoroughly efficient; indeed, I much prefer solid boards to those made with bands, as they use more of the gas and get more pressure at the finish. I am a little surprised at what almost seems his imputation that I got some poor carpenter to make the set "at a venture," &c., especially considering what follows, and must ask leave to state the facts. My own boards were originally a pair of *single* ones from Darker's. When I adopted mixed gasses, I added the third board and legs myself. Later on, changing for larger bags, I employed the "carpenter" referred to, to alter and enlarge these same boards, legs, &c., which he did, and I simply paid him what he asked for this job when done. He is not a mere journeyman, though he started as such; but beginning with one, has now two shops and a thriving business as decorator, repairer, and upholsterer, and ought to know what he is about. After his enlargement was done and paid for, and with the boards actually before us, I asked what another pair made right out would be, for a friend, and he replied, "Somewhere from sixteen to eighteen shillings." That is all I know about it. But in any case, I am somewhat surprised that Mr. Baker should venture upon such a supposition without any possible knowledge of the circumstances.

And still more am I surprised at what follows. "I think Mr. Wright will call to mind that the price of prisms he mentions in his valuable work on *Light* is certainly not commercial if a fair quality is supplied." Here, again, I state the facts. Wanting a prism rather suddenly, years ago, I went into the shop of Messrs. Newton, in Fleet-street, then as an utter stranger and chance customer. I went there simply because on my sole former visit for a tin of limes I had seen a shelf full of prisms in a glass case. I purchased two different ones at the retail prices marked thereon, one of which was as described, and at that time there were at least half a dozen similar in the case at the same price. It was the first and only shop I entered for the purpose, and what I wrote some months after was, that such a prism "could be bought" for the price I had paid, 4s. 6d. But "quality," says Mr. Baker. Well, what I published reads, "Of course such a prism is not optically faced, but only polished like lustres; but it is good enough for most screen work." And so it is. As I do not know Mr. Baker, and never had a word with him as far as I know, I was astonished at his apparent assumption that I know of something to the contrary of this. On inquiry, I learn (for the first time) that he is the representative of Mr. J. H. Steward, and upon that I do remember that Mr. Darker has called upon me, stating that Mr. Baker's firm were unable to procure such prisms as I had described at the price. I took a little trouble over the matter then, on account of Mr. Darker, and ascertained that the supply I had seen were now exhausted, and there was a difficulty in exactly replacing them; but I found Messrs. Newton could still supply a long prism at 8s. 6d. (which, by two cuts, would furnish three), very slightly less in face, but of better quality and better polished; they also supply a slightly smaller prism, fairly polished, for 5s. What I wrote, therefore, still holds good. Prisms of this sort are, of course, not supposed to go through several optical hands, but if wanted, should be ordered direct of dense flint from the flint "lustre" makers, in a small quantity at a time. That is my personal experience which Mr. Baker says I shall "call to mind;" but I do not think it justifies his inference at all. And how I am to know what a prism of a certain common and cheap sort, described as such, "can be bought" for, further than by what it costs me haphazard, in one of the best shops in the city, I fail to see. Had the price been double, I should have paid it just the same. It is no part of my business to run down prices; and although more than one person in the optical trade has been kind enough to place me practically upon "trade" terms, in return for various little matters in which they are good enough to consider I have at times assisted them, as it is a pleasure where possible to assist any one, I have never on any occasion quoted such "prices" to any one else, but have always taken care to ascertain what the usual retail price would be.

Coming back to the main question, one statement of Mr. Baker's I do very much question, that to the effect that the light from bottles is "far in advance" of that from bags. It has often been made since Mr. S. Highley first made it, but I have often seen bottles used and never seen it verified. With one qualification, perhaps: if some old-fashioned jets are used, "banged up" with useless packing, great pressure may produce a better light. But with our modern jets, possessing large chambers and a clear passage, I have yet to see their light with bags surpassed from bottles. I am, however, not only willing, but very desirous, to be convinced, since, as the Editors know, I have very solid reasons for wanting to get on polariscope, and especially microscopic work, the *very utmost light* a lime can give; and if Mr. Baker will let me know in advance of any occasion on which he is about to do his very best, if I possibly can I will be there to learn a lesson, and will own up that his light is better than mine, should it be so, as unreservedly as I now take leave to doubt it. My own experience and belief is, that more than a certain pressure makes a jet roar and does not give more light, and that very often the fourth half-hundredweight gives no advantage until nearly the end.—I am, yours, &c.,

LEWIS WRIGHT.

P.S.—Since the above was written and posted, I have called again on Messrs. Newton, and find I misunderstood the price of their smaller prism.

This is really 3s. 6d. and not 5s., the last being the price of right-angled prisms as required for another experiment I describe. They further now say, that if there is any preferential demand for the larger size I describe at 4s. 6d., or any decent order for it from any one, it can be supplied to sell retail without any difficulty, of better quality than I bought and wrote about. I also find that their ordinary retail price for large double pressure boards, made either solid or "skeleton," as good as it is possible to make them for any practical purpose, is very far indeed under four guineas. Mr. Baker's may possibly have more work or material in them; but I was remarking on necessary outlay only. I did not even remember his name, but only his figures, and had not the least idea that he had any business interest in them. I. W.

March 1, 1887.

**AUTOCHROMATIC COLLODIO-GELATINE PLATES.—
A SUGGESTION.**

To the EDITORS.

GENTLEMEN.—There appears to be a difficulty about using eosine on gelatine plates on account of patent rights. Used in collodion there are no patent rights to contend with. I therefore venture to suggest that eosine be incorporated with the collodion emulsion in suitable proportions, and then, to gain greater sensitiveness, pour on a rapid gelatine emulsion as a preservative; let it rest on for a few seconds, and then drain off. In June, 1885, the question of increasing the rapidity of collodion-emulsion plates by means of a preservative of gelatine emulsion was brought into notice in THE BRITISH JOURNAL OF PHOTOGRAPHY by Mr. Ernest Graham and myself, and I shall be glad to see other experimenters take this process in hand with the addition of eosine.—I am, yours, &c., G. V. J. POIRIN.

Streatham, February 23, 1887.

P.S.—The plates after washing can be dipped in the eosine solution before treating with the gelatine emulsion.

STRIPPING FILMS.

To the EDITORS.

GENTLEMEN.—An article in the issue of the JOURNAL of the 4th instant contains a statement so utterly at variance with my own experience, as well as that of numerous friends using the Eastman stripping films, that I am constrained to take exception thereto and to state the facts as I have found them, for the benefit of any who may feel inclined to use those films.

The article, in speaking of "the old method of transferring the film," says, "After the negative is developed, fixed, and washed, it is, while still wet, squeegeed down upon a glass plate which has previously been coated with a thin solution of indiarubber and dried." Thus far good, but the following is in direct variance with my experience, extending over the past year, and a very considerable number of exposures and developments: "The negative is then allowed to dry, and it is imperative that it becomes perfectly dry, otherwise the next operation—the stripping of the paper backing—will fail."

Now all of my not inconsiderable experience points to the exact opposite of this. I have invariably found that if the negative be allowed to dry thoroughly, it will not strip. The soluble layer of gelatine becomes insoluble, and the paper backing utterly refuses to part from the film. This is the case whenever pyro development has been employed. With ferrous oxalate no such result need be feared, and the negative can be stripped whenever desired. A marked case confirming this statement occurred to me this very evening. A week or two since I developed from exposures from a roll of films made in October last. They developed most beautifully, and were duly washed and squeegeed upon rubber-coated glass plates. In less than fifteen minutes afterwards, one of these plates was placed in a tray of hot water, and almost at once the paper backing left the film of its own accord and floated on the surface of the water. The plate, with the film attached, was transferred to a tray of cold water, a thin skin of gelatine floated over it, the whole removed from the water, gently squeegeed, and placed in a rack to dry. The following morning the film was easily stripped from the plate, and a negative of surpassing beauty and perfection was the result.

But what as to the other three? The hour being late and rest desirable, I left them in the rack to become thoroughly dry, intending to do to-night, failing most lamentably. The paper backing utterly refused to part from the film, leaving the glass only in company with the latter, to the utter ruin of all three negatives. This has never occurred when I have stripped the films before the latter were quite dry, and I may add that this is also the experience of the manufacturers at Rochester.—I am, yours, &c., W. H. WALMSLEY.

De Lancey-place, Philadelphia, February 18, 1887.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, March 9, will be on *Old Dry Plate Processes*.

Exchange Column.

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

Wanted, backgrounds, burnisher, or studio accessories, in exchange for new treadle sewing machine, cost £8 10s.—Address, PHOTOGRAPHER, 45, Chester-street, Wrexham.

Wanted, good ferrotype specimen pictures, quarter-plate or larger; exchange, nitrate of silver, sewing machine, banjo, &c.—Address, CONFECTIONER, 9, Market-street, Exeter.

Abney's book on Emulsions and other photographic literature; exchange single lens or good instantaneous shutter.—Address, COUCH, 8, Berkeley-street, Piccadilly, London.

Will exchange a musical box, eight airs and three visible bells (new), for a 8½×6½ Swift's rapid paragon lens or other noted maker's.—Address, W. B., 16, Rosemount, Douglas, Isle of Man.

Will exchange a fifty to fifty-six-inch tricycle, latest style, for a Dallmeyer's rapid rectilinear lens, size from 12×10 to 15×12, sliding tube or rack and pinion.—Address, JOHN BAXTER, 47, Methley-road, Castleford, Yorkshire.

15×12 landscape camera wanted in exchange for carved oak table (cost £7), gas heating stove, balustrade, grass mat, backgrounds, &c., or exchange for 15×12 group lens by a good maker.—Address, J. HOLLOWAY, 133, Anerley-road, S.E.

Weston's champion burnisher, patent six-inch roller, and battery of nine gem lenses, in exchange for wide-angle rectilinear lens, whole-plate, by good maker.—Address, F. JOHNSON, Photographer, 68, Strand-street, Douglas, Isle of Man.

Will give tricycle, or Moule's Photogen, or one of Wrench's new patent "Metamorphiser" lanterns, or patent air brush, for a bi- or tri-nodal lantern (first-class), or modern portable tourist's whole-plate camera and lens, complete. Difference adjusted.—Address, VINCENT HATON, Huddersfield.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

R. STEELE.—We are not quite sure, but we believe the gentleman uses a portrait lens of long focus.

V. C. YEULETT.—The address of the Willesden Paper Company is Willesden, Middlesex. They will forward you a price-list on application.

BEGINNER asks: "Is there any means of getting rid of the scratches, &c., that invariably come upon the faces of the sheets of ebonite used for drying paper negatives?"—There is no way that we know of removing scratches except by the resurfacing of the ebonite. With care in using scratches will not be formed.

A. WELLS writes: "Could you enlighten me as to how the image is produced on the stone and stock for printing in printers' ink? also if there is any book published on the same?"—Our correspondent should obtain Mr. Wilkinson's book on Photo-mechanical Processes. It may be obtained through any of the stock dealers.

GREENHORNE.—The double combination can, as you are aware, be used for portraiture; but the back lens, as shown in your drawing, is misplaced—that is, reversed. The front lens can be utilised for landscape work by serving it in place of the back, or placing a stop, not exceeding one-fiftieth of its focal length, one and a quarter inch in front.

J. S. N. says: "I have, unfortunately, in bringing my negatives down here spilt a lot of glycerine over some of them; could you tell me of any means to get this out of the film again?"—The glycerine may be removed by copious washing. If the films show a tendency to blister, the glycerine can be got rid of by washing it out with methylated alcohol.

E. HILL writes: "Will you kindly give me a little more of your valuable information? I have a Ross' rapid symmetrical lens, and I find it impossible to take views and interiors in confined situations. Can I make it do so? If not, will you kindly advise what lens to get for that purpose?"—Our correspondent had better procure a portable symmetrical lens of a much shorter focus, so that a wider angle will be embraced.

J. E. GOWER writes: "I have some silver which is useless to me in the metallic state, and I shall be obliged if you will tell me—1. If I can convert it into nitrate pure enough for emulsion purposes?—2. If I should proceed in the same way as in making gold chloride, using, of course, nitric acid only?"—1. Yes.—2. Dissolve the metal in dilute nitric acid—one part acid to two of water—and then crystallise as in making chloride of gold.

G. R. E. asks: "Can you inform me, through your 'Answers to Correspondents,' where the baryta-surfaced paper for collodio-chloride printing, as recommended by Mr. J. Hubert in last week's BRITISH JOURNAL OF PHOTOGRAPHY, can be obtained? I have experimented considerably with this process but always failed to get a suitable paper."—In reply: A suitable paper for the process is supplied by Mr. E. Liesegang, of Düsseldorf.

ORTHO (Wylde Green) says: "I notice in some of the reports of photographic meetings members say how many dozen different kinds of eosines and erythrosines there are to be had, and that only a very limited number will do for orthochromatic plates. Can you give an address where beginners can get the above dyes so that they may be depended upon?"—Messrs. Hopkin & Williams, Cross-street, Hatton Garden, supply a suitable eosine and erythrosine.

A. LEVY (University Club) asks: "Would you kindly tell me if a special lens and very special knowledge are wanted for photographing oil and water colour pictures, engravings, sketches, &c. ? Also, if a special lens is wanted for platinotype work?"—In reply: No special knowledge or appliances are requisite. In the case of coloured pictures, however, better effects will be obtained by employing orthochromatic plates. No special lens is required in platinotype work.

NO NAME.—1. By distilled water is meant water obtained by the condensation of steam. 2. If the albumen be well whipped up with a little ammonia, and then allowed to subside, it may be used for spotting purposes. 3. The reason why the prints show a "milky haziness" when removed from the toning bath is that the silver was not washed out before its immersion. 4. The same developer is used as for ordinary. The difference, if any, in the exposure required in the two makes of plates can be ascertained by experiment.

HALF-PLATE writes as follows: "Will you inform me through your 'Answers to Correspondents' which is the best kind of tricycle, or the make which photographers mostly go in for? I intend to use a half-plate camera, and I thought you would perhaps know which would be the easiest and most suitable, or the make generally adopted by photographers."—It is very much a matter of taste, and different photographers have different opinions on the matter. Any good machine to which the apparatus can be conveniently attached will answer.

BROMIDE asks: "Will you kindly tell me the cause of small black specks which completely cover the enclosed two lantern slides? They are from collodio-bromide emulsion of my own make. I have got these minute specks in making the last two or three batches of emulsion; but I have had them before, but could never account for them. You will notice them much better with a focussing glass held up to the light."—The spots appear to be coarse particles of bromide. No doubt a more careful filtration of the emulsion will get rid of them.

NEO-RUB writes as follows: "In making neutral oxalate of potash with carbonate of potash and oxalic acid, I inadvertently poured two or three drachms of sulphuric acid into the solution instead of two or three drops. Will this exert a bad influence on the enlargements (bromide) I intend to develop?"—Our correspondent does not say to how much oxalate solution he has added the sulphuric acid. A comparatively large amount of acid may be added without doing much harm except making the developing action very slow. A single trial by the development of a print will settle the question.

REV. W. D. writes: "In your 'Answers to Correspondents,' will you please tell me how I can get a white porcelain dipping bath chemically clean? I have used it once or twice for the hypo bath (indeed, it was bought for that purpose), but I am now anxious to use it for a silver bath. I do not like to risk a silver bath until I feel certain it is free from hypo. How can it best be eliminated?"—The best plan will be to fill the vessel with dilute nitric acid—one part acid to fifteen or twenty of water—and then allow it to stand for a day or so. If the glaze be good, as the bath has only been used once or twice, simply well washing with water should suffice.

A PUZZLED ONE writes: "1. For some time I have had a difficulty in getting my prints to tone, i.e., they are painfully slow in toning. After reading this year's ALMANAC I concluded my chloride of gold was at fault, and seeing an article by Mr. T. Forrest on making one's own, I tried the same, following out his instructions implicitly; still my toning bath is not improved. I use acetate of soda—about forty grains to one grain of gold.—2. Should the toning bath be distinctly alkaline? I use ready-sensitized paper."—In reply: 1. We strongly suspect, under the circumstances, that the paper must be at fault. Better try another sample.—2. Neutral or slightly, only, alkaline.

E. DUDLEY says: "Will you please answer the following questions in your 'Answers to Correspondents'?"—1. I had some of England's intensifier made up the other day according to the directions in this year's ALMANAC, and on putting a plate into it found that it did not intensify at all in spite of leaving it in for about thirty hours. Can you account for this?—2. I had also Beach's developer made up. This also would not work, but think this was perhaps due to the pyro solution being wrong. I added one ounce sulpho-pyrogallol (Platinotype Company's). I think this cannot be enough. Please tell me if it is so, and whether it would prevent the image from appearing at all. Can I remedy it now?"—In reply: 1. Probably your correspondent omitted to treat the plate with the ammonia after the mercuric solution.—2. Better make up a fresh solution.

SULPHUR writes: "Can you kindly inform us the cause of the spots on the enclosed print? We have been troubled with similar ones lately on several prints out of a batch. We have tried every means to cure same—different batches of hypo, different brands of paper—but to no purpose, as a certain portion of the prints is sure to get them; sometimes when we take them out of the washing trough, other times after they are mounted or being enamelled. We also discarded the zinc trough, we washed in and used porcelain dishes and pans instead, and still they come. The only cause we can assign for them is that it must be sulphur in the albumen of the paper or else some injurious matter in the water of this town. If it was the latter, why should only some be so? We would be glad of your opinion on the subject."—The spots are clearly due to sulphur, arising, probably, from air bubbles adhering to the surface when they are immersed in the fixing bath; or, may be, when they are removed from the hypo into the first washing water.

ORTHO writes: "1. Some time ago I sensitised some paper according to a formula given in the JOURNAL a few months ago, a second bath being used of citric acid, gum arabic, &c. After using the acid bath a few times it becomes discoloured as the silver bath does. Is there any way of clearing it?—2. I have a French lens which does not seem quite satisfactory somehow. If I were to send it to you would you examine it, and say if it could be improved by any means?—3. If all the waste solutions containing silver, such as hypo baths, pyro baths, old toning baths, &c., are put together, will zinc deposit all the silver, and how long does it take before all the silver is deposited?"—1. When the citric acid bath becomes discoloured, fresh should be made. It is not expensive.—2. Send the lens here.—3. Zinc will reduce the metals contained in the solutions. The time required for their reduction will depend upon the temperature. The higher it is the sooner will the action be completed. There is no silver to be reduced in the old pyro developer for dry plates.

Der Amateur Photograph is the title of a serial issued by Ed. Liesegang of Düsseldorf, the first monthly number of which we have received. It contains several articles of a class intended specially for amateurs. It is printed in German.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—Mr. Hubert writes to say that, as he would like to introduce a measure of reform in the working of this Association, he requests those in favour of such alleged reform to meet him at 181, Aldersgate-street, E.C., on the evening of the 24th instant.

THE fine photographic and scientific collection of Mr. Edward Viles is advertised for sale on this day week. Mr. Viles having given up country life in favour of London, finds his whole time so absorbed with his literary work that he has resolved to distribute his entire collection of photographic appliances.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next ordinary meeting of this Society will be held on Tuesday next, March 8, at eight p.m., at the Gallery, 5A, Pall Mall East, when the discussion will be taken on the paper read by Mr. J. B. Spurge at the last meeting, and a paper will be read by Mr. H. P. Robinson on *Exhibiting and Exhibitions*.

A HAPPY suggestion was made by Mr. Edgar Clifton at the North London Photographic Society on Tuesday evening. It had reference to the temporary shutting off the light from the screen on which photographic transparencies were being projected by the lantern, to prevent the act of substituting one picture for another from being seen. The suggestion is to employ an ordinary pneumatic single or double-flap shutter, the pneumatic ball being placed between two small bellows-shaped boards, and in such a position on the floor as to be easily pressed by the foot of the lantern operator during the moment when a fresh slide is being pushed forward in the carrier.

UNDERWOOD'S CAMERAS.—Mr. J. Solomon, 22, Red Lion-square, has afforded us an opportunity of carefully examining the most recent designs of the Underwood Camera, for which this firm is the London agent. It is a camera that is both easily and quickly set up, and which will stand much tear and wear. There are certain mechanical features in its construction which tend to lightness and rigidity, and to facility in working. The manufacturers are E. & T. Underwood, Birmingham, and some of its features are patented.

In the Photograph and Record Department, in charge of Sergeant Thomas H. Adams, are preserved about 60,000 portraits of between 6000 and 7000 criminals. Many of them have been received from other cities, and are not included in the Rogues' Gallery, which contains the busts of the "best people" arrested in New York. When a professional is photographed, fifty copies of the negative are taken, and the "pedigree" of the person printed on the back of each copy. One copy is then despatched to each precinct, where the pedigree is entered on the Record Book, and the picture placed in the Rogues' Gallery, as at headquarters. The remainder are retained for the use of officers, and for exchange with the police authorities of other cities. Gallery and Record Book are the patented inventions of Sergeant Adams. Portraits of deceased criminals are removed from their infamous companionship, as are those of the four per cent., more or less, of living ones who turn from their evil ways when young, and by years of well-doing entitle themselves to this favour, which is granted at their own request, seconded by that of reputable business men. Should they relapse, their portraits are returned to the case.—*Harper's New Monthly Magazine*.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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ORTHOCHROMATIC PLATES BY SOAKING.

Such considerably divergent opinions have been expressed by different experimentalists with regard to not only the effect produced by soaking plates in solutions of eosine or erythrosine, but also as to the keeping qualities of plates so treated, that in the course of our own experiments we have given some attention to an attempt to find where the discrepancies lie. As a result, we are inclined to name as the cause the method adopted in soaking the plates; and though we cannot go so far as to say that this constitutes the sole cause, we have proved by actual trial that it is possible by treating portions of the same plate in a different manner with the same solution to produce entirely different results.

It is not our intention here to speak of any particular solution or formula, but simply of the mechanical application of *any* of the solutions recommended for the purpose, whether the treatment consists of a single or a double operation. Our remarks, therefore, may be taken as referring to all.

In the first place, let us suppose a plate plunged direct into the optical sensitising solution; the first and most important point to see to is that the film be thoroughly and uniformly imbued with the solution. This depends of course upon the length of time the solution is allowed to act, and the latter, again, varies with the character of the film treated. Thus a film consisting of soft gelatine will absorb the solution more rapidly, and perhaps, also, more uniformly, than one in which a harder gelatine has been employed or chrome alum has been added. Some films, too, show a persistent "greasiness" upon wetting, especially where no ammonia is used in the solution, and may be soaked for a long time before the liquid runs in anything like an even manner from the surface.

Until this occurs it is scarcely possible to hope for uniformity of action, and if the soaking be prolonged in either the colouring solution or that of silver nitrate sufficiently long to produce that effect, then it is probable that the photographic or orthochromatic properties of the plate may be injuriously affected. We would recommend, then, that the plate be first soaked in distilled water until the film is thoroughly softened, and the water runs evenly over the surface without streaks or grease-like markings. When the latter occur, a broad camel-hair brush passed over the surface will prove an assistance, or, better still, a pad of picked cotton wool thoroughly wetted may be applied with some force until the water takes "kindly" to the whole surface. In some cases, especially when the film is composed of a particularly hard gelatine, or the plate has been long prepared, it may be advisable or necessary to render the water very faintly alkaline with ammonia, or where the latter is objectionable a small

quantity of glycerine may be added. In either of these cases, however, a final rinse in plain distilled water should be applied before immersing the plate in the colouring or colour-sensitising solutions.

The film after this treatment is in a condition to absorb whatever subsequent solutions are applied to it more uniformly, though less rapidly, just as a plate soaked in water before development develops more slowly, though with greater regularity. It will also permit the superfluous liquid to drain away more evenly without standing in beads or drops; though in order to promote absolute uniformity we prefer to pass a very soft, pure black rubber squeegee *once* over the surface of the plate, and so remove all superfluous solution. The camel-hair brush or pad of cotton wool are objectionable for this purpose, as they are apt to leave the solution in streaks.

Another advantage of the preliminary soaking, and perhaps the greater, is that any soluble matter that may exist in the film through imperfect washing of the emulsion is by this means eliminated, and so cross actions are prevented. Slight traces of soluble bromides or nitrates in a film plunged directly into the colouring solution would no doubt exercise some influence of one kind or another; but, whether beneficial or otherwise, it is better removed, as likely to lead to uncertainty in using different batches of plates. Another substance likely to be found in some films is chrome alum, and this, too, would be advantageously removed without destroying the effect for which it was originally added to the emulsion. In fact the preliminary soaking in distilled water seems calculated to give us a cleaner and purer basis to start upon.

In conclusion, we reiterate that it is more than probable that many of the discrepancies in the results that have been reported from soaked plates are traceable solely to the method in which the soaking has been performed, as we can ourselves vouch that very different effects are frequently given with the same plate when the preliminary soaking is omitted.

MARVELLOUS things have been effected by micro-photography, but there is a limit to the degree of diminution attainable, this arising from the silver of which the *imago* is formed being deposited in coarse granulated particles, that is, coarse from a microscopist's point of view. Where exceedingly fine writing or drawing for microscopic examination is required then must the services of the diamond point be had recourse to. These remarks are *apropos* of our having met, the other day, the venerable Mr. W. Webb, one of the earliest members of the Photographic Society, but better known in connection with his marvellous skill in producing microscopic writing. A slide which he had just executed, and which he favoured us with, contains the Lord's Prayer written so small as to require an eighth of an inch power on

the microscope to see it. The best way to convey an idea of the dimensions of the writing is to say that if a square inch were written over with letters the same size, the whole of the Bible and half a Bible more could be contained therein in quite legible form, this being equivalent to five millions of letters. Photographic reduction could not, of course, approach this, even within almost immeasurable distance. Mr. Webb designates this latest effort of his as a Jubilee slide.

It appears to be a popular fallacy with a certain number of photographers, that portraits enlarged from small negatives are, of necessity, free from distortion. Many imagine that a portrait which is first taken on a small scale, and subsequently enlarged, must always be less distorted than if the picture were taken direct. This however does not necessarily follow, for under some conditions the direct picture may be the less distorted of the two. For example, if the original negative be taken with a short focus lens placed very close to the sitter, which is frequently the case in taking small portraits, a certain degree of distortion is introduced. This, though not conspicuous to the casual observer while on the small scale, often becomes painfully so when the picture is amplified. Here is one of the reasons why enlargements sometimes fail to please the sitters and their friends, though the small original was considered satisfactory, while they may be unable to point out a definite reason for dissatisfaction.

IN taking a large portrait direct, if a long focus lens be employed so that the camera can be placed a great distance from the sitter, there will be little or no distortion. The great mistake in taking large direct heads, as we have frequently pointed out, is that of using lenses of far too short a focus. In the old wet collodion days, lenses of large angular aperture were almost imperative, but it is not so now. Gelatine plates when employed with lenses of long focus and comparatively small aperture, require far less exposure than used to be necessary when the collodion process was worked even under its most favourable conditions. Large heads can now be taken direct without difficulty, and, to all intents and purposes free from distortion, provided a lens be used of sufficiently long focus to permit of the camera being planted at a considerable distance from the sitter.

ANENT the article last week *On Business Matters*, a correspondent in the country writes, denying that the same "seedy state of things" which he says reigns supreme in most London studios exists to the same extent in country ones. This we can confirm, for we know that, as a rule, the higher class of studios in provincial towns, particularly in seaside places and holiday resorts, are far better cared for than are those of a corresponding status in the Metropolis. If the whole of the discarded properties and backgrounds which are totally unusable, owing to their being out of date or too dilapidated, which are now crowded up in corners in many studios were eliminated, and only those in actual use retained, the room would really look better furnished, and also present a more modern appearance generally. Here is a hint for the coming season, to all whom it may concern.

WHAT has been said with reference to the studio and other departments of many establishments, applies with equal force to the outside specimen frames. If half the pictures exhibited in some show-cases were removed, the remainder would prove attractive. A few faded or yellow portraits in antiquated costumes, interspersed amongst others which are fresh and in modern attire, are quite sufficient to leaven the whole batch. At the entrance to what, a few years back, used to be considered one of the leading West-end establishments, are to be seen some specimens which were produced probably some fifteen or more years ago by its late proprietor. The photographs are yellow and fading, and are in the old-fashioned *passe-partouts*. The only merit these pictures ever possessed was, that they were somewhat large for the period at which they were taken. These photographs appear to quite overpower some really good work of smaller dimensions of a modern type which is in close proximity.

MARCH is not usually looked upon as an unpropitious month for photography, so far, at least, as fogs are concerned. This year,

however, it has opened, as February closed, with a succession of foggy days such as few remember to have seen before at this season. The fogs have not been confined to the Metropolis alone, but have been pretty general throughout the kingdom. On several occasions they have been accompanied by sharp frosts, which have produced some excellent hoar-frost effects, and some admirable photographs of them have been secured. Occasionally at this season some charming frost pictures may be obtained, but they must be taken pretty early in the morning, because, when the sun breaks through, its heat quickly causes the sparkling crystals to disappear; hence the artist who wishes to secure this class of picture must be on the alert at this time of the year.

NOTWITHSTANDING the advantage of the electric light to those who possess it, in bad weather it is not always the photographic panacea that many are led to believe. In dull weather, or when there is no natural light whatever, the electric light is satisfactory enough. But when a dense fog pervades the studio it is found, in practice, that brilliant negatives cannot be obtained unless, indeed, the camera be brought very close to the sitter. This entails the employment of a short focus lens with its concomitant evils, which the most skilful retouching fails to remedy. Obtaining satisfactory negatives through twenty feet or so of a genuine "pea-soup" London fog—however many thousand candle-power the electric light may be—is not an easy thing to accomplish, as all know who have made the experiment.

ECHOES FROM THE SOCIETIES.

"THE negatives turned out nowadays are not worth calling negatives at all." Such is the dictum of a professional platinotype printer, and I could not help calling it to mind a short time since, as I looked at a wet-plate portrait negative taken many years ago by a first-rate professional. There is something about the look of a good wet-plate negative that altogether puts gelatine in the shade; but for printing results I am bound to say the statement I have quoted is not only too sweeping, but is far from the mark. My own opinion, that the work of the best gelatine men is equal to that of the best collodion men, while, if we go to inferior workers in both classes, the gelatine work will be, out and out, the better. I know one amateur of eminence who, though he had worked collodion processes for years, never turned out a presentable picture, except in his own estimation, until he took to gelatine; another, who had exhibited good collodion work unsuccessfully on many occasions, but took a prize the first time he exhibited gelatine.

But Mr. F. M. Edwards, when he made the statement, was speaking in connection with the platinotype process, which, he says, requires good negatives, those by the wet-collodion process being the best. Undoubtedly the process requires, in order to produce the finest results, not only a "good" negative, but a good negative of a certain class—dense, and with plenty of gradation from almost absolute opacity to clear glass—just the type of negative that was more frequently found in the wet-collodion days than now. But I deny that it is impossible to produce such with gelatine, or that it is more difficult in competent hands. Perhaps the reason such negatives are not more common nowadays is that tastes have changed in such matters.

With regard to the discussion that has been going on as to the permanency or otherwise of collodio-chloride prints, I think as much may be said as in connection with ordinary albumen pictures. One, like the other, may be permanent—that, is reasonably so—or it may not, according to circumstances. A year or two after the first publication of the process I saw some positives on opal in the studio of an artist of repute that had been produced in this manner, and which in the short time since their production and under favourable circumstances for keeping had faded from their pristine purple tone to a sickly brown, highly suggestive of sulphuration. On the other hand, a few months ago I came across, in the portfolio of a friend, some collodio-chloride prints on paper, which, from their tone and the purity of the lights, might have been executed yesterday, though, my friend informed me, they were at least fifteen years old; and a couple that had been hanging for several years on the walls of his study

appeared in nowise different. It is possible the opal glass might have exercised a baneful influence in the one case, but the other seems to me to prove that collodio-chloride prints need not necessarily fade.

But there is another possible reason for the difference, though it is with something like fear and trembling that I mention it at the present time, since the practice is coming into vogue again. I allude to the employment of the sulpho-cyanide toning bath, which was in great favour for collodio-chloride pictures in the early days, and is now in equal repute for gelatino-chloride. About the same time, too, the sulpho-cyanides were recommended as substitutes for hypo as fixing agents, and I remember somebody spoke of them as "the fixing agent that will not fix." Perhaps the sulpho-cyanide fixing bath might have been the delinquent.

The Cellier mechanical colouring process received a good advertisement in rather gushing language in a report of the Birkenhead Association some time ago; but although the advertisement tells us what it will do up to a certain point, it says not one word as to how it differs from a score—nay, at least, a hundred—of similar methods, patented and unpatented, that have seen the light during the past few years. The poikelograph, crystoleum, oleotint, and any number of others have, in turn, "glimmered like a meteor" and then—"gone."

In reading through the weekly reports of the meetings throughout the country, one cannot help being struck with the vast change that is going on in favour of practical and useful demonstrations. Time was when the monthly meeting of a Society formed a convenient opportunity for professionals to meet and talk business matters, and amateurs to compare notes and results; and if any one read a paper on "A Trip to the Land of Goshen with the Camera," it pleased the author no doubt, and was accepted by the company assembled as a matter of course—a part of the day's business, in short. I don't object to the "Where-to-go-with-the-Camera" style of lecture if it is illustrated by means of the lantern, and the lecturer is not too diffuse in his descriptions of the scenes displayed; but, I think, even lantern entertainments are better unaccompanied by any formal "lecture;" the name of the view and any information, historical or interesting, that can be conveyed in a few words, without delaying the entertainment, are, to my mind, quite sufficient. As a proof of how photography has advanced the lantern in favour, I notice that out of nine meetings reported in one week, no fewer than six were "lantern" meetings.

Under the head of practical demonstrations we may fairly class any actual exhibition of the working of a process, whether new or old; and these are, I fancy, what are most wanted nowadays by the vast number of new recruits in the photographic army. Though there are innumerable hand-books and guides to the science, few, if any, go sufficiently into minute detail to bring matters within the comprehension of the complete tyro; besides which "an ounce of practice is worth a pound of theory;" and in the course of half an hour's demonstration a novice may pick up more than he could in a year's reading.

As a contrast to this style of filling part of an evening's meeting, I may briefly refer to a paper on an art subject read before one of the oldest societies in the kingdom, by one who has hitherto figured as a chemist. Such feats of word-playing as "the monochromatic studies of *mens* and lens" may be ingenious, and perhaps interesting to the immediate friends of the author, but to parody a well-known saying, "*Ce n'est pas la photographie.*"

Before leaving the question of practical demonstrations, I would point out an instance where such would be an advantage. At the last technical meeting of the Photographic Society another long discussion took place on the subject of orthochromatic photography, in the course of which it transpired that while some found orthochromatic plates of the greatest use, others could derive no benefit from them. One section found the yellow screen absolutely necessary to success, others invariably worked without it. Then again, though some who had successfully prepared and used orthochromatic plates found they would not keep, one, at least, of the speakers avowed that they would keep as well as others. Patent rights were then touched on. But it is, of course, impossible to enter on a practical demonstration on such a subject except in a court of law. Still I would suggest that the conflicting parties in the technical part of the question should appoint a night to "have it out," or try and convince one another, though I am afraid that some of them, though forced by the circumstances of the

occasion to "comply against their wills," would "remain of the same opinion still." But that would not matter much so long as the lookers-on had the dust wiped from their eyes.

By the way, alluding to Mr. Debenham's remarks as to the German method of examining applications before granting a patent, how is it that, though Messrs. Tailfer & Clayton were refused protection for their invention on the ground that it was not new, a patent was subsequently granted to a German for what appears to be substantially the same thing? MONITOR.

ON THINGS IN GENERAL.

I AM rather surprised at a certain important statement made by Professor Stebbing having been allowed to pass without comment, seeing that it appears to enable us to view the eosine patent in an entirely new light. He informs us that in 1877 he prepared gelatino-bromide plates with emulsion that had been dyed with eosine, he preparing the plates, and M. Ducos du Hauron supplying the dye. The centre upon which the whole subject turns is the publicity of this treatment. If it was publicly known in 1877 or 1878 that eosine was used in combination with gelatino-bromide emulsion, I think it may be taken as a fact that the Tailfer & Clayton patent, dated several years subsequently, is not worth the paper it is written upon, unless there be in it a special claim for a combination of ammonia and eosine used with the gelatino-bromide.

Mr. Albert W. Scott's hints upon the use of coal-tar colours are decidedly useful, and collodion, as he justly states, is infinitely superior to varnish for producing a coloured film upon glass. This explanation he offers of the change of colour in a varnished film may be supplemented by the statement that, as varnish is often made of the coarsest samples of methylated spirit, the impurities in that spirit may be the cause of a change of colour from red to violet, as it is a fact well known that aldehyde—a frequent accompaniment of such spirits—rapidly changes magenta into an excellent blue, and thus a strong-magenta solution, partially altered, would appear violet in colour. Further, with regard to the dyeing action upon gum arabic, so far is it from being the case that such gum is not dyed by coal-tar colours, that I may say gum solutions of the dyes are not infrequently made by adding spirituous solutions to strong acacia mucilage, and well stirring the whole; the colour leaves the spirit and attaches itself to the gum, from which it is not separated by dilution with water. Mr. Scott is a practical man, and his lantern articles abound with useful hints. I should be very glad if he could tell me where to obtain the stout white drawing paper, six feet square, that he speaks of, as four feet nine inches is the utmost width I have ever been able to meet with, and I have tried many places. A six feet sheet of paper would be very useful to me for certain purposes.

I see in a recent number of this JOURNAL an account of the photographing of a bullet after being fired from a rifle, its velocity at the time being about a quarter of a mile in a second. There is no doubt that even in these days of dry plates and drop shutters this is a marvellous feat, compared with which the photographing of the "Flying Dutchman" at express speed is mere child's play. But—"history repeats itself"—I should like to ask whether something quite as wonderful was not done nearly three decades ago when dry plates were not? Was not a bombshell in flight taken by means of a *Skaipe's Pistolgraph*, as the remarkable little instrument was eophonously called?

Again may I say, "History repeats itself." Some considerable interest has recently been created by the introduction of an "iris diaphragm" to photographic lenses. I do not know how long such a diaphragm has been used as a microscopic adjunct, but I have a most distinct recollection of seeing a photographic lens fitted with a diaphragm of similar, or equivalent, construction close on a quarter of a century ago, so that it is scarcely just to speak of it as a "recent" introduction.

I noted, as did Mr. England, the droll utterance of Dr. Jacobs at the Leeds Society meeting. Of course, as regards the necessarily brief abstracts of the many Society meetings recorded in these columns, it is easy to understand how difficult it must be to give a correct *précis* of each speaker's words; but it is not easy to imagine what else Dr. Jacobs could have said at all like the words attributed to him,* than which

* See Dr. Jacobs's letter of explanation in another page.—EDS.

words nothing could be more absurd, "The amateur had a great advantage over the professional photographer, in being able to invest his subjects with artistic attraction." Whatever his ability to impart such increased attraction may be, he is too modest to make a point of frequently exhibiting it in his works, and I must say that the logic that deprives a man of his powers of artistic expression the moment he becomes a professional is of a very halting character. It is also news to me that the professional has daily presented to him a series of "miserable-looking specimens of humanity, generally incarnations of ugliness."

If ever a need for the enactment of a particular clause that appeared in one of the abortive copyright bills, to the effect that no picture should be exhibited without the exhibitee's permission, was proved, it was in the letter to the Editors by a correspondent, "W. C. B.," replied to in the last number for February. This fellow actually asks for advice from the Editors how to proceed when "people object to what they term being 'stuck up' in a show case," for, he says, "a photographer cannot be expected to be always changing his specimens merely to suit whims and fancies." These are the men who are a disgrace to the profession. "Whims and fancies," forsooth! I think the above initials must be wrongly given—C. A. D. would be nearer the mark. It is difficult to keep one's patience; I wonder how the Editors manage to keep theirs. However, of course, if they said all they thought there would soon be an end to the "Answers to Correspondents" column, for which I should be sorry, as it is a constant source of interest and amusement to me, as also are certain portions of the advertisement pages. The latest cutting from the latter that has gone in my cabinet of curiosities is an advertisement that runs—"45 Warnerke.—An emulsion maker, who can with certainty produce plates of the best quality giving above number, will be disengaged," &c. Such a man has no right to be disengaged, he is too valuable to lose. My Warnerke is only marked up to 25, as are those of most of my friends, and to think that 45 can be obtained raises a feeling of the intensest wonder as to how it is done.

What a capital lecture was that recently delivered by Mr. J. Traill Taylor at the Society of Arts! There are few who cannot learn something from it; and his description of the various modes of finding the focus of a lens is a capital summary. But, as a matter of fact, who, out of the thousands possessed of a camera and lens, ever is wise enough to ascertain for himself the focus of his lens or lenses? Very, very few, I am certain. Yet the process is very simple. For the average photographer who cares little for optics and will not go to the least trouble for finding the foci of his lenses, I am inclined to think the method given in THE BRITISH JOURNAL OF PHOTOGRAPHY a few years ago is the simplest and easiest yet given. One had to hang up a two-foot rule and observe the size of its image when the camera was at a certain distance away. This size marked on paper with a pencil was compared with a series of lines given in connection with the article, and the focus was read off at once out of the table given with these lines. Here was no trouble worth speaking of. All that was necessary was to have the JOURNAL at hand.

FREE LANCE.

BICHIROMATED GELATINE EMULSION PAPER.

BEFORE proceeding to a description of the developing operation I should like to interpolate a few remarks which further experience with the Obernetter paper have led to.

In my previous article I spoke of the occasional adherence of the print to its original support if too long exposed in the printing frame. This danger, I find, is far greater than I at first found, especially when chloride of sodium is added to the sensitising solution, as the colour of the sensitive surface is then so light that the solar influence penetrates too readily through the whole depth of the comparatively thin layer of emulsion; and in the case of a negative combining delicate half tones with strong shadows, it is difficult to secure the former without rendering the latter adherent. In this case, though portions of the image may develop successfully, the film will be torn on stripping away the paper. With thin negatives offering little contrast, and using a very weak sensitising bath—not more than one and a half per cent.—the development is easy, provided the printing be performed in a weak light, and its progress carefully watched, which is easily done

on the pale yellow surface. When the half tones of the picture are just visible it is done.

I also mentioned that I had not tried the effect of sensitising without the addition of salt, but I have now done so, and find it an improvement, inasmuch as while it lengthens the exposure, as I had expected it would, it naturally lessens the danger of printing through to the insoluble substratum. In this case, however, the bright scarlet colour of the sensitive paper quite masks the faint brown image produced on the plain yellow surface, and consequently renders the timing of the exposure a matter of guess-work, unless an actinometer is used. So great is the difference between the two forms of paper, or, rather, of sensitising, that a sheet, one half of which was dipped for an instant into the sensitising bath containing chloride, after immersion in plain bichromate in order to discharge the red colour, developed successfully, so far as the scarlet portion was concerned, though the other half tore away with the paper, the parti-coloured sheet having been exposed as a single print.

The method I mentioned casually as giving promising results, that in which the emulsion paper is blackened by exposure to light before bichromatising, appears to me now to be the best of the three; the very much darker colour of the layer of gelatine retards the penetration of the light, with very much increasing the exposure as compared with the scarlet form; while, in addition to that, the combined action of the light and free silver upon the gelatine-itself colour the latter, and so add greatly to the face of the image produced. The body of gelatine is quite sufficient, but it is so weak in silver as compared with a negative emulsion, that after development, when the silver haloid alone forms the image, it is absolutely necessary to resort to heavy intensification in order to secure sufficient force even for opal work. But the preliminary exposure to light not only darkens a portion of the haloid, leaving the rest *in situ*, but it also stains the gelatine itself, without in any way rendering it insoluble, and so produces an image of ample strength for opals or for transparent positives, to be transferred to paper or backed up with any white material.

It may be noticed that the image produced by this last method, if dried when the glass picture comes away from the hot-water bath, presents, when placed in contact with a sheet of white paper, precisely the appearance and, it may be presumed, the composition of an untuned and unfixed print made upon Obernetter paper in the ordinary manner, *minus*, of course, the unconverted haloid. Its colour is a bright red, verging between those peculiar photographic *nuances* described from their character as "brick," and "cherry red," tending, however, more in the latter direction. Here, then, is a chance of making opal positives of the true "photographic purple" tone by simple gold toning, and without the slightest suspicion of any lurking sulphuric compounds to cast a doubt on their permanency, for no hypo is used in the process. True chromium salts are said to have a clinging love for gelatine paper, and especially opal, but I do not think that would seriously affect the permanency of even the tone, and not at all the picture itself. All the carbon prints, I fancy, that I ever saw, which have shown changes of colour under the influence of time, were early single transfer prints, executed perhaps before the danger of lurking chromium salts was suspected.

But to proceed to development. Let the requisite glass supports be prepared before commencing to manipulate the prints. If opal, in the case of "matt surface" it will only require carefully cleaning, though a thin layer of hardened gelatine will be no detriment. If the opal be smooth, *i.e.* polished, the substratum is absolutely necessary. If the prints are to be retransferred from plain glass to paper the former must be prepared with French chalk and coated with collodion, after which it is washed free of the ether and alcohol and left in cold water until wanted. If to remain permanently upon the glass, as in the case of a lantern slide, the French chalk is omitted and a coating of collodion, or gelatine and chrome alum, applied alone.

In connection with lantern slides a few words may be said with regard to the preparation, both of the tissue and the mounting glasses, in order to secure neatness and to have the picture in a proper position on its final support. Let the pieces of tissue be cut very accurately, and considerably smaller than the regulation size of lantern slide. Supposing the opening in the finished slide to be two and three-quarter inches, whether square or circular let the actual mounting mask (or one identical with it) be employed as the "safe edge." Let

the pieces of tissue be cut accurately to three inches square, and let a similar-sized opening be ruled symmetrically about the aperture in the safe edge. This will leave a protected margin of one-eighth of an inch all round the picture, while there will be a similar difference between that and the glass to allow for expansion of the paper when wetted. This is of great importance, as if the paper extend over the edge of the glass the picture is sure to come away in development. For the rest, in placing the tissue in the printing frame it is only necessary to place the safe edge correctly upon the negative, the tissue upon that, its edges coinciding with the ruled lines; and finally, before squeegeeing the tissue on to its glass support to see that it is exactly in the centre, and, in fact, as carefully placed as if you were mounting a print. This being done, the finished picture will be straight and central.

The first operation in development is to immerse the exposed tissue in cold water until perfectly limp, or nearly so. With ordinary carbon tissue, in consequence of its considerable thickness, this requires some little time, but with our present paper a few seconds suffice. If too short a time be allowed it will not be flat on the glass; if too long, it will not adhere through the subsequent operations. The best plan is to just immerse the glass support, and then, plunging in the tissue, bring one edge into proper position, a little within the corresponding edge of the glass plate. As soon as the paper seems about to lose its tendency to curl, or a little before, draw the glass out of the water with the paper in contact, and, if there are no creases or folds, lay it down on a smooth table, cover it with a sheet of bibulous paper, and that again with a piece of American or waterproof cloth, and pass the squeegee over it several times, gently at first and afterwards with more force, finally placing it under pressure. If several prints are to be developed they may be placed successively in a pile, with a sheet of blotting-paper intervening; or if only one or two, a screw printing frame may be used.

Allow the prints to remain under pressure for at least a quarter of an hour, then place them in a dish of cold water for a few minutes. This is more necessary than with ordinary carbon tissue, as, owing to the short immersion before squeegeeing and the non-permeability of the Obernetter backing, there is not sufficient water contained in the sensitive film to cause it to dissolve readily and evenly if at once immersed into warm water.

After soaking in cold water for five minutes they may be transferred to water at about 100° Fahr., from which they are taken one by one into much hotter. It is impossible to name the best temperature, but I find with this paper it must be high, as, owing to the reasons I have already given, the paper and glass do not readily separate at a low temperature. Three or four minutes in the hot bath may elapse before the paper begins to show signs of moving, but it should not be hurried. When the gelatine appears to be melting at the edges, try gently with the fingers if the paper will slide upon the glass, but do not be rough. When this stage is reached raise one corner of the paper, and, still under the surface of the hot water, slowly but steadily peel it off. Then lay the glass in another dish of cooler water and proceed with another.

The development is by no means finished, perhaps scarcely commenced, for the image will in all probability at this point be perfectly invisible, hidden by a hopeless-looking smear. It is desirable, however to allow the gelatine to soften thoroughly in cold or tepid water before proceeding further, and the whole of the print to be developed may be brought to this stage before going on to the next. No harm is done by leaving them to soak, but the subsequent operations are greatly facilitated.

When the whole of the prints have been stripped, the first one is taken and again immersed in hotter water, say at about 120° Fahr., and moved about that the softened gelatine may be removed from its surface. Gradually the high lights of the picture will be seen as clean glass, and when all appears clear and bright a rinse under the cold-water tap will finish the operation, and so with the rest.

If on attempting to strip off the paper, supposing the soaking in cold, tepid, and warm water to have been sufficiently performed, the film should tear, it is evidence of over exposure. Frequently the sky of a landscape will remain adherent to the glass, while the rest of the picture goes away with the paper. If the paper strips without

difficulty, and the subsequent treatment leaves little or nothing on the glass, under exposure is the fault.

If the developed image is to remain on the glass on which it is, nothing remains except the toning, of which, however, in connection with these thin films, I am not in a position to speak in this article. Before proceeding to that part of the subject, I wish next week to refer to the method of making an emulsion and coating paper, which removes all the trouble arising from the insoluble substratum of the Obernetter paper. I hope then to be able to deal with the toning and finishing.

I have devoted more time and space to this subject than at first I intended, but in my renewed experiments I have discovered in the process possibilities I had not previously suspected, and that must therefore be my excuse.

H. Y. E. COTESWORTH.

PORTABLE DARK TENTS.*

WITHOUT placing on record any chimerical suggestions for an entirely new form of tent, let us try and see if we cannot improve upon the old one, at any rate, so far as the present occasion serves, to the extent of its carcase. I am confident that a thoughtful commercial attempt to remedy the defects I have pointed out would meet with success, for there is no doubt that if a really serviceable developing tent were introduced it would sell like wildfire. It has been the one thing wanting for several seasons past. To begin with, I have little or no fault to find with the outside dimensions of the present tent; writing from memory, a 10 × 8 is about 28 inches by 21 by 7—nothing out of the way. The shape is in its favour—which is more than can be said of other types, such as the umbrella, the music-book pattern, and so on. For the wooden body, however, I would substitute something else; wood is not a vital necessity, it is heavy and untrustworthy. I think a well-made mail canvas would do. It is largely used for camera cases, is strong, and if not absolutely light-tight might easily be made so by being given an inner lining of ruby fabric. It will stand a tremendous amount of wear. I have seen camera cases which have been all over India and Europe, braving a thousand vicissitudes and returning quite uninjured. If it were employed for the body of the tent it would do away with a power of weight, and, what is more, as it is of such an eminently serviceable nature, would obviate the employment of costly brass-bound mahogany for tropical climates, and indeed of a travelling cover which, with wooden bodies, is a *sine quâ non*. Then, as to the stand. This is, as most people are aware, an imposing affair; it is twice the size and weight necessary, although I am bound to admit it has to support a lot, and is both rigid and strong. But under our reformed tent it need not be so big, and strength can be obtained with less work. I would make the head into which this tripod fits a permanent part of the base of the tent. The major portion of the front elevation of the tent ought to be monopolised by the window—the little strip of glass which makers give us at present being ridiculously inadequate, especially if the outside light be dull. There ought to be no difficulty on this head, for, of course, when the tent was closed the glass would, as now, be shielded from breakage by a movable panel or door.

One of the principal causes of the unpopularity of the present dark tent is that although it is fairly easy to set up it requires considerable ingenuity in order to close it again. A vast cloud of twill, supported by a framework of iron rods, seems necessary to ensure immunity from the actinic rays. One would think that two thicknesses of some suitable material could be used; apparently, however, this is not the case, for three and sometimes four thicknesses are considered necessary. This covering seems to be too voluminous—and as a matter of fact it is, for manipulative purposes. I should think a fairly stiff canvas lined with ruby fabric and bellowsed, so that it can be easily folded and unfolded when packing and unpacking, would be more satisfactory than the present arrangement. As it is, when packing up the tent a neat fold is almost impossible at the hands of an ordinary male brute, feminine assistance never being at hand when it is wanted. An inverted conical bellows—so that the lower part could be easily secured to the body—would be a great blessing, and is highly practicable. Naturally there would be no absolute necessity for bellowsing the covering that formed the roof and sides although, properly done, it would be an advantage.

So much for the carcase of our model tent. I should say that the weight of one constructed upon my suggestions would not be an ounce more than seventeen pounds, and would come very near to something like real portability. The employment of such a material as mail canvas—or something similar—as a substitute for wood is highly

* Concluded from page 134.

desirable. Intending purchasers of the present form of dark tents are invariably floored by their weight, their general stuffiness, and that indescribable ponderousness always, in my mind, associated with them. It is no uncommon thing for a cultivated amateur to exclaim, "I could make a better one myself." That is just the very thing that is wanted, and if somebody would only attempt it, and publish the result of his labours, much might come of the attempt. "Oh, but we are quite in the hands of the shopkeepers!" cry some. *Au contraire*, Messieurs, they are in yours. The coming season looms in sight; I believe that if a developing tent modelled upon the imperfect suggestions I have thrown out were placed on the market it would find a swift sale, particularly if its internal arrangements were correspondingly improved. This, by the way, reminds me that I have not, as yet, touched upon that branch of the subject, which must perforce stand over for a future opportunity, when, perhaps, we will "step inside."

MARSTON MOORE.

METHODS OF RETOUCHING.

III.

My own experience of retouching began in Paris very many more years ago than I care to set down on paper, still I do not wish to lay down my own system, or systems, as infallible, or the ones fittest for imitation. I therefore wish to be as general as possible, and give for instruction the methods producing results which I consider the most correct as well as artistic. For this purpose, therefore, I wish to make a few remarks upon the methods of retouching in Germany, France, and the Continent generally.

I will take Germany first, as the methods most practised there are bold and decidedly artistic. Even when they fail as *negative retouching*, which to be really good must preserve likeness, they possess a certain independent merit of their own, owing to their decided and skilful treatment. A good German retoucher treats a head, say, the ordinary vignette cabinet size, just as he would a crayon drawing of similar dimensions. This, needless to say, is a bold treatment for a negative, and one likely to efface the leading markings in a finely lighted negative. Still, I have seen some very beautiful results produced, but the retoucher must be very skilful, or he will have to pay for the beauty of effect by the comparative loss of resemblance.

He generally begins by carefully filling up all the transparent spots or lines, as in the methods already described. He does this, however, in a slightly different manner to those I refer to, inasmuch as he uses the point of the pencil much more, lightly dotting or spotting until he removes all the markings—such as blotches, freckles, and optical exaggerations—until the face presents, comparatively, a smooth and even surface, free from any traces of such blemishes.

He now starts on the modelling of the face, which he accomplishes by means of cross hatching as a foundation, placing a line or touch here and there as his eye may catch a defective or unfinished portion of the face showing a want of gradation.

The next points treated are the *high lights*, which he at once puts in their respective places, and then gradually softens into the half tones and shadows, until the negative assumes that appearance of roundness and delicacy of modulation so grateful to the eye of a retoucher. To produce this effect is the sole object he has in view at starting, and its consummation not only affords him pleasure, but is a kind of reward for his pains and skill.

As a retoucher following this school becomes more and more experienced, so his touches or strokes of the pencil will become bolder and bolder, under which latter treatment a negative will possess much greater artistic value, inasmuch as it will be freed from that mechanical stiffness so generally observable in a beginner's work. As is natural to suppose, broad and bold cross hatching, even in skilful hands, will not always secure a finished picture, so our retoucher of the German school begins to fill in any defects which may appear between the lines or cross hatches. In this way not only a bold and dashing effect is gained, but also a very taking picture will result. Notwithstanding all that can be said in favour of this method, it always will have its glaring disadvantages as regards portraiture generally. For what is termed *publication pictures*, it is undoubtedly good, as a brilliant result is certain to be obtained, and the loss of likeness is scarcely a disadvantage. In pictures of this class the resemblance is a matter of very secondary consideration. The public will not buy an *ugly* portrait, especially when it is of some one they do not personally know; but they do buy a "pretty picture," and make themselves believe it is also a correct likeness. Whether the public be right or wrong in this regard I will not dare to offer an opinion. I will only say with the old showman, "They pay their money and they have their choice."

The method practised most generally by the French has at least

one very great advantage over their German rivals, inasmuch as the likeness is much less likely to be lost, this, too, although there is but a trifling difference in the handling. Indeed, in most of these methods, the commencement is nearly the same, that is to say, the retoucher begins by levelling up or spotting out all the defects on the negative until it becomes even throughout, and then worked until it presents a sufficiently soft appearance. When they have worked a negative to this stage (having levelled the face and removed all the inequalities) the majority of good French retouchers effect the necessary modelling by making very fine, long, downward strokes, somewhat curved. This treatment will not produce the effect of that stipple which would be the most suitable, but it will make the face so treated very smooth and soft.

This method, too, is not so vigorous as the German, but, as you may easily see on consideration, the likeness is less likely to be lost. I must say I prefer it to the other, because a somewhat similar result can be gained without losing what to me seems the most essential quality of a portrait—the likeness. It is also quite as acceptable in fancy work, or what may be styled "*publication work*," as its rival.

Before the "dry" plates became generally in use, the old-fashioned collodion plates required the help of a medium in order to give a *tooth* to the film. Generally the negatives were treated with a solution of gum, or a mixture of gum and dextrine, dissolved in warm water. This washed over the film of a negative would give it a surface as readily worked upon with a pencil as a sheet of drawing paper. Like everything else in life it has its disadvantages, the worst being the liability of the film to split when varnishing. This misfortune is of course accounted for by the absorption of moisture by the gum and dextrine. The Germans, in order to avoid this trouble, mostly retouched on the *varnish*, using a medium such as already described to obtain the necessary tooth for working. So much for old style.

In the modern "dry plate" this danger of the films splitting is altogether obviated, and each artist can follow out his especial style to his heart's content. We have only to use a medium, of which there are numbers in the market, to give the necessary surface for taking the pencil, and then dash away in pursuit of the desired result. We have unfortunately at times to put up with a very great trouble, notwithstanding all our advancement. There are various kinds of mediums which, although giving a splendid tooth for working on, fail to retain the work placed upon it during the process of varnishing. Necessarily this entails double work upon the retoucher and is nothing short of a misfortune to the poor, hard worked, and (I don't hesitate to say it) generally underpaid retoucher who works "on piece."

The coming off of the work during varnishing may result from a number of causes. If the film be slightly damp, the plate not properly heated, or the varnish not of a proper consistency, all will result in worry and trouble for the retoucher. Still, like all who worship, however humbly, at the shrine of art, we must take "the rough with the smooth." I may here tell all intending retouchers that they will find much more of the former than the latter as they struggle along. They will also find some difficulty in finding a medium that will make it more *toothsome*, and even varnishing will not make it smooth.

There are some very fine specimens of work come from Russia, notably St. Petersburg and Moscow. I cannot positively say how they have been retouched, but judging from the subjects before me I feel inclined to say the German school, but in a modified form, predominates. Vienna, too, sends us some fine specimens of the photographic art. The retouching in my opinion, although very fine and pretty, bears the stamp of being over laboured. As I said before, excessive work or too bold and dashing a style, may be all very well for fancy pictures, but they are simply absurd when employed in portraiture. I would not dwell so much on this point only my object has been in these "papers" to treat retouching almost solely in its connection with portraiture; and good portraiture without likeness is to me an impossibility.

Taking a look all around, I think America has sent us as fine specimens of photography and retouching as any country in the world. In the *first-class* American photographs, as compared with similar works produced on the Continent, I think there will be less fault to be found. They do not look so over worked and hard. Even in cases where we, as experts, know they have been so treated, it will not be observable to the eye of the ordinary observer. The climate of England generally is not over favourable to the production of really excellent photography. Still there are times when it is *favourable*, and the results gained on such occasions will, I am confident, hold their own beside the best produced in any other country in the world.

A few remarks on the treatment of so-called "Rembrandt" pictures may not be amiss just here, as I think it will nearly complete our

study of retouching and its methods as strictly applicable to portraiture. In many cases this kind of picture will be found somewhat more difficult to manage than the generality of ordinarily lighted ones. Many times photographers attempting this style of lighting either make the light upon the profile too strong or the shadow too intense. To the retoucher one fault is as troublesome as the other. Negatives which would yield very decent results are often spoiled by after intensification, and thereby effacing all the details in the light side of the face.

There is no light in nature however strong but has detail and modulation, and so also should it have in a negative. Rembrandts are mostly profile, so we would start work at the edge of the light upon the forehead, and soften it into surrounding parts until the temporal arch is reached; in this case the drawing of the arch should be preserved by the placing of a light to show its formation, but always keeping same in harmony with the prevailing shadows and half tones. Great attention should be paid not to efface the modeling, but rather to preserve the relative importance of each detail. There is no indication of the malar bone and the palpebral muscles which should be lost. I do not mean unduly accentuated, but sufficiently relieved so that they will show well when printed to that density necessary to show off this style of picture to the greatest advantage. There never can be a good Rembrandt picture which will not print with clear, brilliant shadows.

The light on the nose must be carefully worked, and the drawing of the same rectified if necessary, also the corner of the eye, and the oft-times deep shadow formed by the orbital arch. In under exposed negatives the retoucher will have a deal of trouble treating these latter points. The lights on the cheek bone (giving formation to the face), the lips, and chin, are all points which demand careful attention. Where the negatives are defective owing to under exposure, the work necessary, both before and after varnishing, can be supplemented by matt varnishing and stumping on the reverse side. This latter must only be resorted to after the ordinary work has been carried as far as possible.

Should there be little or no variety in the tone of the background, a pleasing effect may be produced by indicating a light close to the figure or face on one side (generally the one remotest from the light) and somewhat more distant from it on the other. Before attempting this, examine any portrait, so lighted, painted by a good artist, and found your own work on the same principle.

REDMOND BARRETT.

LANTERN ARRANGEMENTS AT DUNDEE.

In connection with Mr. G. D. Macdougald's remarks on the splendid success that followed the efforts of the Dundee Photographic Association to utilise the electric light for lantern work, I may perhaps be allowed to say a few words. I was at once an interested and a disinterested party. As Mr. York's slides from my negatives were the ones used, and as I was the lecturer, I may safely be said to have had an interest in the affair; but as I am not a member of the Dundee Association, and had no hand in the lantern business on the occasion in question, I may claim to have had no prejudice for or against the system of illumination. But this I will say, that not only were my previous doubts as to the electric light for the lantern completely dispelled, but in all probability I shall for many a year to come look upon the arrangements of that evening as my *beau idéal* of what such an entertainment on a larger scale ought to be. I have of late years acquired some slight experience of the routine of limelight lantern work and lecturing, and I do not believe that any reader of this JOURNAL will put down to egotistic motives my action in commemorating to a certain extent the events of February 10 in the Kinnaird Hall of "Bonnie Dundee."

I was most politely, but unnecessarily, consulted before the meeting as to the light for the lantern and as to the size of the screen. When I heard of a thirty-foot disc I was, I admit, adverse to the idea. My "adversity" was only slightly modified when I heard that the screen was to be whitewashed; it was modified to the extent of about twenty or twenty-five per cent.; for at a guess, and judging at hazard, I calculated the waste of light by absorption of an ordinary screen to be about twenty per cent. I was not able to form any opinion as to whether a screen of such a size would be either necessary or advisable, for I did not know the size nor the shape of the hall. I thought, and I still think, that a twenty-five feet screen is large enough for most halls, and, if anything, a shade too large for the best slides and limelight. But I am now convinced that the thirty feet screen was not a bit too large for the hall, and not a bit beyond the power of the light that was used on the occasion. While I was on the platform I could form no opinion as to the sharpness of the detail, the quality of the illumination, nor the proportions of the screen, all that

I could verify was the remarkable steadiness of the light. But after the opera was over the electricians kindly "turned on" a slide, while I viewed the effect from the body of the hall, and I could not but own that for brilliance and just proportion nothing better could have been desired. The screen was tastefully draped with red cloth, and was altogether a paragon of screens.

I had several times before seen the electric light used as the radiant for optical lanterns, and if I doubled the wisdom of a thirty-foot screen I still more questioned the advisability of using the electric light. I never before saw it anything like steady, and I never before liked the colour produced by it shining through any slide: in fact, I had mentally condemned the electric light for the optical lantern; or, to put it at the mildest, I could only "damn it with faint praise." I do not know what particular form of lamp was used at Dundee, nor did I see the machinery which was across the street, but I am able to attest the steadiness and good colour of the light. It is a pity Mr. Macdougald has not told us more about the lamp; perhaps he may be induced to do so still. The light was so brilliant that even with coloured glasses I could not examine it—(to say the exact truth, nobody would have been much the wiser if I had been able to examine it).

One thing must not be omitted in this connection. The heat of the lantern was astonishing. The slides required to be made quite hot on a gas stove before insertion in the lantern, otherwise a smash would have been inevitable, and the vicinity of the lantern would be a good preparation for Carpentaria.

No signalling was heard between myself and the lanternists, for right under my nose was an electric "push," which acted on a bell in the lantern room, the bell being muffled so as to be inaudible to all but the operator. The scenes were changed as if by the mere exercise of my volition, or as if I had trained them to come on spontaneously in their proper places.

Altogether, I shall not in a hurry forget Dundee; and perhaps I may be allowed to add a few words to what I have written, by way of making a few remarks on what I saw during my memorable and delightful visit to that city. I shall avoid remarks that I might be tempted to make regarding the social kindness I received, and I will endeavour to confine myself to what will interest my readers.

I saw and used the studio of an amateur, a studio which, for convenience and elegance, is not surpassed by any studio I ever saw. When I say that 15 x 12 portrait cameras, with stands and lenses to match, were rife in the studio, and when I add that I found Seavey backgrounds on Morgan's supports, it will be understood that all the necessaries for good work were available, the brains and taste being presupposed. I admit it was a new and delicious sensation to me to fire off a 12 x 8 plate, under expose it, and still escape without an anathema. I did it, however, several times, and the owner of the plates—if he did not like it, at least pretended not to object. And I actually discovered a person—not an old maid—who really did not like being photographed. It was worth while to go to Dundee for that alone! The owner of this studio and I spent some time testing various lenses, and I found among other things that I possessed a fifteen-inch single lens, that gave me straight architectural lines to within an inch of the edges of a 12 x 8 plate. If there is any distortion it is not visible to my eyes. I believe there is much misunderstanding about the capabilities of "single" lenses; every day I am coming nearer and nearer to the use of single lenses alone, even for subjects supposed not to be amenable to any but rectilinear.

I also visited the establishment of Mr. Valentine, the widely known photographer, chiefly of landscape. This gentleman claims to have the largest establishment of the kind in the world, and he is at present making a great addition to it. The boss of this show may safely lean all his weight on his staff, but he seems to prefer to lean chiefly on himself. He develops himself all the negatives sent in by all the operators he has travelling about, and as these amount to thousands yearly he ought to know something about development. I noticed that he used in his dark room a ruby globe open at the top, the room being all painted red, so that I found at least one man of like opinion with myself as to the best colour for a dark room. The system of saving residues of silver appeared to me very complete, and I saw in use enormous print washers à la *Sturrock*, only "far more so." Mr. Valentine prints to a large extent and with great success in platinum-type, and a gentleman of the staff, who I think was called Frank, very frankly showed me how he did it. The whole detail of printing was being carried on on a scale to me positively alarming, and I left the place in a very thoughtful frame. I saw a very great many young ladies—all unmasked and untouched, some round, some oval, some cushion-shaped, but all, I am sure, quite square; to any one I might (on the 14th) have said, "Thou shalt be my Valentine."

A very good *tone* prevailed over the whole establishment, every one seemed to be fixed and permanent; H. S would have fled in despair

and in fact the whole arrangements showed the most careful development. Though the establishment is being enlarged it would be very difficult to reproduce it even with a very heavy layer of gold. Mr. Valentine affects negatives of a very plucky nature; he says that he considers albumen prints from such negatives to be more lasting than those from more delicate *clichés*, and I agree with him down to the ground. Plucky prints seem to take on more gold, which appears to me the best safeguard for permanence in albumen printing. Mr. Valentine had all his negatives—considerably over seven in number—arranged in racks or grooves, and so numbered that the printers can, without racking their memory in the *press* of business, pick out any required negative at a moment's notice. Each negative requiring a cloud printed in had its particular cloud negative, and a certain number of young ladies—not "Celestials"—were employed in the "sky line" alone. These young ladies were plainly visible above the horizon, and may be said to have reached the highest point or zenith of the profession. Some (of the ladies) had a fine sharp outline, while others were beautifully vignettted away. I have, however, said enough on this subject, and must now dissolve into another. Mr. Valentine turns out an enormous number of slides: for this work he finds winter the season best suited; during frost he makes his slides, and the thaw is appropriate for his process, which is the wet one.

ANDREW PRINGLE.

FORMULÆ FOR DEVELOPERS: HOW SHOULD THEY READ?

[A Communication to the Society of Amateur Photographers of New York.]

I THINK that the questions we have for discussion to-night are both apt and timely, especially so when we see how flooded the literature of our art-science is with the constantly increasing armies of developers.

The tyro is early told by the many writers "to choose out a good developer and stick to it." Sound and good advice, surely. But how is he to pick it out?

It is like taking a young man into a machine-shop and saying to him, here are all the materials required, and all the tools necessary to work with, now go to work and build a locomotive. Does he know the difference between a wrench and a jack screw? So it is with the beginner; scores of formulæ for developers are before him, but what does he know of the properties of the different ingredients? The pyro, what is it for, and how does it act upon the emulsion or the plate to bring out the latent image? The carbonates of soda and potash? He sees that some use one, some the other, and some both. Is he told their action and the requisite amount necessary to produce that action, and what is the sulphite of soda added for to the above, sometimes in "A" and sometimes in "B?" He is told that citric acid and its salts and the bromides are restrainers. Restrainers of what? He sees that the bromides are recommended for over-exposed and under-exposed plates; but why? And so on. Even the fixing bath is a perplexity to the beginner.

But even when he has mastered, to a considerable extent, the properties of the different articles comprising the developing bath, his troubles are not at an end. The great array of unscientific, incongruous, bulky, wasteful, and happy-go-lucky developers (and a careful survey of the different published formulæ will soon show that each of the above classes have one or more in its ranks) stare him in the face. From which is he to choose? If he is determined to know himself, and not take the word of another, he begins by mixing up one developer after another according to the formula given in each case, and tries them in turn, in search of a good developer and the one that will give him the best reward for his work; but he soon finds the shelves of his dark room full of bottles and his pocket-book empty. Or suppose that a fair young lady amateur, not having the knowledge, time, or facilities to prosecute the above experiments, chooses, by the advice of a friend, a certain developer, which must be made up strictly in accordance with the formula. Intending to take a trip for a short stay in the country where she hopes to make some shots at choice bits of woodland and lawn, she has the developer made up for her at the nearest drug store, never dreaming of the result in bulk. Now "A" calls for sixty ounces, "B" forty-six ounces, and an equal quantity of hypo solution is required. To start she must sling her camera in its case over one shoulder, tuck the tripod under her arm, seize two one-gallon demijohns in one hand, a demijohn of the same size and one or two hand-bags in the other. Her dismay at this bulk can easily be seen. "The impediment" of this outfit would soon tire out the most enthusiastic of amateurs.

How much better it would be, especially to the amateur, if all the formulæ were given so many grains to the ounce of water. It would take but a glance to convince him whether it was a scientific one or not, whether the proportions of its ingredients were correct and

capable of producing the best and desired results. What a saving of time and money it would result in; saving in solution of many of the salts used, and especially sulphite of soda, which rapidly deteriorates and becomes useless, or nearly so. Why then make them in that way? Why not let the formula read:

Carbonate of soda.....	So many grains.
Sulphite of soda	" "
Pyro	" "
Water	1 ounce.
Carbonate of potash or soda	So many grains.
Water	1 ounce.

And then multiply each ingredient by ten or its multiple, and you will have a developer of sufficient quantity and sufficiently fresh to meet all demands; and then, if the plate makers would paste on the cover of their boxes their formula for the developer reduced to grains to the ounce, it would be of great advantage and economy to any one trying one or two plates. The developer could be made up before opening the boxes.

A careful analysis of eighteen published formulæ shows a great diversity in the amounts of the ingredients, and

The largest amount of pyro used to the ounce of water..	10	grains.
" " sulphite of soda "	"	.. 80 "
" " carbonate of soda "	"	.. 40 "
" " " of potash "	"	.. 21 ⁵ / ₁₆ "
The smallest amount of pyro used to	"	.. 1 ³ / ₈ "
" " sulphite of soda "	"	.. 5 "
" " carbonate of soda "	"	.. 1 ¹ / ₂ "
" " " of potash "	"	.. 5 "

In many of the formulæ the amount of sulphite of soda was largely in excess to the quantity generally conceded to be required in proportion to the pyro—four of sulphite of soda to one pyro. But in one we have sulphite of soda, fifty grains; pyro, six grains. Another formula says his alkali is weak, forty grains to the ounce of water!

The use of saturated solutions in making up the developer should, I think, be discarded, for the reason that they are uncertain, the changes of temperature and evaporation rapidly affecting them; and then the mixing of two or more saturated solutions oftentimes produce the deposition of more or less of one or both of the salts, but never in equal proportions.

I think also that the use of either the dry or granulated salts is also objectionable, especially the carbonates—carbonic acid is not the most stable element. In the crystal you have a fixed and determinate quantity, and they should therefore always be called for.

I have not referred to the part of the question whether the ounce should always be regarded as composed of 480 grains, for if the method of writing the formula in so many grains to the ounce of water be adopted, there is no further trouble to be apprehended as to whether the ounce is 437 or 480 grains. But should the term be used? I think that the quantity in grains should be given (in 437 ¹/₂ grains or 480 grains). This is rendered necessary from the fact that most of the articles used are sold by avoirdupois weight, 437 ¹/₂ grains. Another good plan would be, in directions for making up the formula if the grain system is not adopted, to say: Water, to make so many ounces. One should recollect in reading the English formulæ that there is a difference of four ounces more in the pint used by them.

JOHN H. JANEWAY.

FILM PHOTOGRAPHY.

[A Communication to the Bristol and West of England Amateur Photographic Association.]

IN THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for the current year will be found a contribution of mine on *Stripping Films*; but since it was written the process in question has been so improved that I gladly take this opportunity of bringing it before your notice, and at the same time of supplementing my paper in the ALMANAC. The Eastman Company were kind enough to let me have for trial some of the first of these films which came over from the States, and I worked them last summer with complete satisfaction and success—so much so that I have no hesitation in recommending the process as one that will produce negatives in all ways equal to glass, and in some respects superior.

If I may not be considered out of place in going over the same ground twice, I may describe the stripping film ("American Film" the Eastman Company call it) as a film of *insoluble* gelatine emulsion attached to a sheet of paper (which serves as a temporary support) by a thick layer of soluble gelatine. In appearance it resembles the ordinary negative paper, and its treatment is the same as regards exposure and development; in fact, if the negative is consid red not

worth stripping it can be squeegeed to glass and printed from in the regular way. Presuming the emulsion-coated paper to have been exposed in the roller slide (and this is the only way to work films properly), it is cut into the right lengths and then developed. I may here remark that the emulsion is very rapid, clean, and free from fog, giving a brilliant image with any amount of density that may be required.

As to development, the Eastman Company, in their original instructions (they have not yet issued the new directions) lay especial stress on the fact that soda developer must be used, as there is a risk of the pyrogallum acid, when mixed with ammonia, attacking the gelatine substratum and rendering it insoluble. Although this may be right in theory, it is not so in practice, and I have always used ammonio-pyro development in preference, as giving negatives of better printing colour.

The following is the formula:—

- A. Sulpho-pyrogallol.
- B. { Potassium bromide 120 grains.
Ammonia (°880) 6 drachms.
Water (distilled) 6 "

To develop—take water, 2 ounces; A, 20 minims; and B, 2 minims, commencing with half the quantity of B.

After development wash the negative well and fix in tolerably clean hypo; this will, as a rule, do away with the necessity of using the acid and alum clearing solution later on. The negatives only require a few minutes' washing and are ready for the first of the stripping manipulations, namely, *squeegeeing to the collodionised glass*. Take a clean glass plate a quarter of an inch larger all round than the negative, dust it over with French chalk, rub clean with a cloth, and then coat with plain collodion. I am informed that enamel collodion diluted with two ounces of ether and one ounce of alcohol to the pint is the correct thing, but I turned out an old bottle of autotype transfer collodion, which answers perfectly. Let your collodion *set well*, and wash the plate thoroughly until the greasy lines have disappeared, then put your negative face downwards into the dish, bring it out clinging to the collodionised plate, and squeegee in the usual way, of course, putting a sheet of American cloth between the negative and the squeegee, and not using the latter too vigorously. Now lay the plate on a table, negative upwards, place two thicknesses of blotting-paper over it, and then put upon the top of it a board with almost ten to fourteen pounds weight on it. Take negative No. 2, squeegee it to a collodion-coated plate as before, and place it on the top of No. 1 with two more sheets of blotting-paper, and so on until you have a pile of about a dozen negatives under the board. This is an operation that does not take long, as a dozen plates can be coated and the negatives squeegeed on within an hour, and by this time they are ready for the first stripping, which may take place any time within fifteen minutes to two hours (or more) after the squeegeeing.

The *stripping off the paper support* is next proceeded with as follows:—Turn your pile of plates upside down, and place No. 1 in a porcelain dish, pour over it water at 100° to 120° Fahr. (not hotter). In about two minutes the paper will blister up and become loose at the edges, then you can lift it up bodily at one corner, and gently draw it off the negative film, which will remain firmly attached to the glass; then, with a little more warm water, wash off any of the gelatine substratum that may be still sticking to the film. With ordinary care failure is impossible; but it is well not to use water at too high a temperature, or to attempt the stripping too soon after squeegeeing, or failure may result in either case. Stripping from the collodionised plate contrasts wonderfully with the original method, which required great care and delicacy of manipulation, for you can go ahead now without the slightest risk of spoiling your negative. No pouring boiling water over the film or rubbing it with the finger (generally into a hole) to get off the paper which would stick in some obstinate place, and what is equally important, no waiting for the negative to dry between the squeegeeing and the stripping, but you can develop, strip, intensify (if necessary), and attach the gelatine skin, all one after another without delay. As regards intensifying, you can judge of the density of the image so well in developing that it should be seldom necessary, but when it is required, silver or mercury intensification can be applied at this stage. Should clearing be thought desirable, acid and alum can be used, but *not previous to the stripping*, since alum in any form would probably render the gelatine substratum insoluble.

To *Squeegee the "Skin" to the Film*.—When the process was first introduced in America a warm solution of gelatine was poured over the film after the paper had been stripped off, and the plate was then set on a level shelf to dry; but as this involved a lot of trouble in the drying—which took longer than a gelatine plate does to dry in its preparation—the Eastman Company substituted what they term a

"skin," which is squeegeed to the plate instead. The "skin" is composed of gelatine, to which is added glycerine to render it flexible, and must be cut in pieces rather smaller than the negative, as it expands considerably when wetted. It should be soaked in water containing a little glycerine (glycerine, one ounce; water, twenty to twenty-five ounces), for if placed in water alone the glycerine in the skin dialyses out, and the film becomes horny on drying. If, on the other hand, too much glycerine is used the film will take a long time to dry, and be difficult to strip from the glass. The solution is best used fresh for each lot of films, or difficulties will occur in the drying. After the "skin" is soaked until quite limp it is squeegeed on to the film—bright side outwards—taking care to avoid air bubbles; it is then set to dry, the time occupied in drying depending very much on the warmth of the room and the state of the atmosphere. I have repeated at length, from the article in the ALMANAC already referred to, these details bearing on the treatment of the gelatine "skin," since I consider them important for the successful working of the process. As to the drying of the plates, this occupies about the same time as the ordinary gelatine negatives on glass. I usually carry my films into the kitchen at night, and find them dry next morning. *When perfectly dry* the film should be coated with collodion, and in a short time can be cut round the edges with a sharp knife, and stripped without difficulty from the glass. The object of this last coating of collodion is to prevent the film being affected by damp, and in this respect these latter negatives are superior to those made by the old method, which were liable in time to become slightly spotty, or to get stained by contact with the sensitised paper in printing, if the paper was not absolutely dry.

Owing to the recent improvements in the process it will be found: First, that the stripping off the paper support is now a most easy and certain operation, on account of the drying of the film after squeegeeing to the plate being dispensed with; and, secondly, that the whole of the manipulations will occupy no more time than is required for the washing and drying of a gelatine negative.

Several films should be treated in succession; and of course a certain amount of method is necessary in working a process of this nature, but nothing beyond ordinary care is requisite to make it a success. Personally, I have found it in every way successful, and consider the negatives made by it will compare favourably with those made on glass, and be superior as regards halation—in fact, I look to film photography for a distinct advance in the future in both landscape and interior work.

For tourist work, some films are simply invaluable; and who has not felt the want of them when travelling abroad, with the difficulties of the Custom House, the bulky luggage, and the risk of breakage. But we shall change all this, and with our roll holder and spools of "strippers," set off in future to the "Continong" with the happy assurance that we have no plates to be smashed by the railway officials, or to be opened at the *Douane*; and added to this, shall have the satisfaction of knowing that at the end of a long day's toil we shall be freed from that most tiresome of occupations, the changing and numbering of one's plates. Eastman and Walker, we shall bless you then!

II. MANFIELD.

THE LANTERN MICROSCOPE.

[Abstract of a Communication to the Manchester Microscopical Society.]

It is some eight or ten years since I felt dissatisfied with the results which I was then able to obtain with the ordinary lantern arrangements for projecting microscopic objects upon the screen, and began to make experiments with the aim of getting more successful illumination. The amount of light transmitted through the bi-lens lantern condenser being in the inverse ratio of the square of the distance between it and the luminant, I tried to shorten the space by the well-known device, first introduced by the Rev. W. T. Kingsley about 1855, of adding a third lens to the other two, and thus shortening the compound focus. But this I soon found was, without further addition, of no use whatever, as the cone of rays at its apex was so large, or the light passed through it at so great an angle, that it was impossible to transmit it through both the object and the objective. Thus the beam of light, however strong it might be at the focus of the condenser, did not reach the screen, and therefore served no purpose except that of boiling the object in the balsam used in mounting it.

I next placed another lens in the cone of rays a little beyond the focus, and hoped by this means to so lessen its diameter as to make it capable of transuission. This was a sort of sub-stage arrangement, and was found to be a great improvement when the lens was of the right focus for the objective, and was situated at the right distance from both it and the object. To be able to thus place it at the right distance from both, meant having a sub-stage lens for all objectives

differing widely in power, the focus of each being such as the power and construction of the others might require. Rack and pinion movement was also found to be necessary, so that the rays might be properly focused on either side of the object. The lenses used should be large enough to take in the whole cone of the principal condenser, and for the higher powers it is requisite to combine two or three of them together. The highest as well as the lowest powers may thus be made useful for lantern projections. Mr. Kingsley stated in his paper upon this subject at the time I have just named that he could transmit as much light through the higher as through any of the lower powers, and gave diagrams of the arrangement which he made use of.

So much for the past; now we come to the present. The objectives which I shall use this evening are 2", 1", and $\frac{1}{10}$ ". The 2" requires the sub-stage lens to be a little over 2" focus, $1\frac{3}{8}$ " diameter, plano-convex. A similar kind of lens, $1\frac{3}{4}$ " focus, proves in my hands to be a good all-round condenser for all powers from $1\frac{1}{2}$ " up $\frac{1}{10}$ " objectives. By liberal use of the rack and pinion and of the concave lens to be presently described, this sub-stage lens gives the most brilliant results throughout this wide range of powers. The $\frac{1}{4}$ " objective, when it is desirable to use it for photographic purposes, requires two lenses; the back one to be $2\frac{3}{4}$ " focus and $1\frac{3}{8}$ " diameter, and the front one $1\frac{1}{4}$ " focus and 1" diameter, both plano-convex. This also makes a good condenser for the $\frac{1}{10}$ " objective. All the lenses must have the curved surfaces turned towards the lantern. The luminant goes to within $1\frac{3}{4}$ " of the back lens of the principal condenser with the 2", and to within 2" with the other two objectives. I have tried it closer than this, by using a back lens of shorter focus without advantage, in fact, considerably otherwise. If a flint concave lens is placed in the cone of rays about one or two inches before the really active ones begin to cross, the light is much improved. The concave which I use is about 6" focus and $1\frac{3}{4}$ " diameter. It is so placed in the tube which carries the other sub-stage lenses that its distance from the principal condenser can be altered so as to modify the length of the cone of rays to adapt the focus of the other lenses to the objective when they do not exactly meet its requirements. The concave lens was, I believe, first introduced into the lantern cone of rays by J. T. Taylor in 1866, for the purpose of parallelising them, but I do not use it for any such purpose in this lantern microscope. In my lantern polariscope I imitate Taylor in the use of the concave, but here the purpose served is quite a different one. My lantern condenser is $3\frac{3}{4}$ " diameter, with a plano-convex $3\frac{1}{2}$ " diameter and 7" focus, mounted upon the back of the tube which carries the other lenses.

In lantern microscope projection three things are essential. The first is brilliant illumination, the second large amplification, and the third clear display of detail. But brilliant illumination does not mean a dazzling display of light upon a large white screen, showing a dark, patchy outline of an object, without detail. Objects shown in this way are far inferior to an enlarged woodcut. The light must be made to enter the object so as to bring its structure out to the eye of the onlooker. But no amount of light will do this if its dimensions are too small for the crystalline lens to form an image of it upon the retina. With high-power objectives the light must, in the nature of things, be greatly subdued. Still, a large image, moderately but properly lighted, can be far better seen than a small one many times as bright. An object may in fact be too bright to be seen. If rays of great angle are too powerfully converged upon it the image becomes as bright as that part of the screen which represents nothing but bare glass. It is in this case just like an over-exposed photograph, flat and without contrast. The image may, therefore, be too bright for the screen, just as it may be too black for it, and what we have to aim at is that mean which will show the detail in one without making the other too glaring.

Having made our arrangements according to what is here advanced, we ought to be able to show the various minute organs of insects and the details of vegetable and animal tissue. I have shown very finely the blowfly's tongue over sixteen feet long, and the male flea with its outstretched legs twelve feet long. Sections of spine of echinus may be magnified to seven or twelve feet diameter, and section of a rat's tail eight feet diameter. Mites in cheese with such powers become large as guinea pigs, and *volvax globator* gracefully rolling over a sixteen-foot screen are larger than tennis balls. The cornea of the *dytiscus* is a most wonderful object when shown eight to ten feet in diameter.

When I say that such things can be shown in such enormous sizes, you must not suppose that the display will be like an outline map, black and skeleton-like in appearance upon a white ground. Instead of that the small capillary bloodvessels in anatomical sections, the various appendages of the feet of insects, the hairs of plants, the rings of insect trachea, the eyes of insects with the light gleaming through

each facet of the cornea, with other equally minute details, can be displayed to an audience with very great satisfaction. That you must admit far surpasses anything ever achieved by the old lantern microscope, and we boldly challenge any admirer of the old method to show that he is not now left as far behind by the new one as the old stage-coach is left behind by the railway train.

I think I ought to say that my lantern microscope has been made by myself. All its details have been worked out by myself. I have, of course, utilised any old photographic lens mount, or old microscope fittings which I could get to work up into my arrangement, so as to save mechanical labour. It fits, as you will see, into the ordinary lantern front. The alum trough goes into the place which holds the slider when the lantern is used for ordinary pictures. The stage is one of Dancer's old lantern microscope stages, but is modified so as to hold and enable me to change the sub-stage condensers, which can be done more easily and with less loss of time through mine than it can be done through any other arrangement. The compactness of the instrument is also something worth considering.

Since the foregoing pages were written I have fitted up a one-inch objective which is very satisfactory. It transmits a large beam of light, and gives a flat field of great size, the central and marginal definition being fairly good at the same time. As a rule the best ordinary objectives give no definition beyond a small circle in the middle of the field.

NOTE.—This lantern microscope was exhibited at the Manchester Microscopical *soirée* on the 29th January, 1887, attached to a photographic camera, the bellows body of which opened out to thirty-six inches. With the $\frac{1}{10}$ " objective, images were shown upon the screen magnified eighty diameters, and were seen well defined, brilliantly and equally lighted, without covering being placed over the camera, notwithstanding the gaslights overhead and all round the room. The field was noted for being as even as a sheet of writing-paper. When the lantern door was opened much astonishment was expressed when it was seen that all this illumination was obtained from a small paraffine lamp burning with a single half-inch wick. Thus the lantern microscope in this form becomes as useful to the micro-photographer as it is to the lecturer or the science teacher. W. LEACH.

Our Editorial Table.

INSTANTANEOUS PHOTOGRAPHY.

By C. W.

Bath: Charles Seers, 1, Argyle-street.

THIS is the maiden effort at photographic literature by a gentleman whom we well know to be capable of writing with authority on the subject on which he now treats, in what is little more than a pamphlet of eighteen pages, but in which there is much that is useful. The author favours the production of small negatives, and believes that the near future of photography lies in the direction of "very carefully taken, artistic small negatives, with the view to these being either in part or in whole subsequently enlarged."

The term "instantaneous," as applied to photography, he considers to be on the whole sufficiently well defined as "any photographic picture which, without blurring, clearly indicates objects in motion;" and assuming this as an intelligible definition, the author considers that the duration of an exposure must vary considerably, as the object photographed is in more or less rapid motion. In one case the duration of an exposure of one-fifth or one-tenth of a second may be permissible, whereas in another, one-hundredth part of a second will be scarcely sufficiently brief.

The essentials in an instantaneous shutter are grouped together under the following headings:—(1), It must be capable of giving a brief exposure. (2), It must be capable of giving a variable exposure. (3), Its construction must be such that, during exposure, it allows the lens to act with its full power and under its most favourable conditions. (4), Its construction and position must be such that the plate is as evenly illuminated as possible. (5), It must not shake the camera. (6), It must be as light and portable as is consistent with good work. (7), It must permit of the use of suitable diaphragms. (8), Its construction must be such that it cannot in any way derange the optical conditions of the combinations of the lens. (9), It should be simple to work, not liable to get out of order, and must of course be light-tight when closed. Each of these points is treated of with a reasonable degree of fulness, and a practical deduction is made therefrom. Certain manufactures come in for a

share of favourable comment, with which we have nothing to do. The little work is ably written.

HINTON'S BOOK OF PHOTOGRAPHIC LABELS.

As implied by the name, this book (issued by Hinton & Co., 38, Bedford-street, Strand, W.C.) is a collection of gummed and perforated labels of the most useful chemicals and "mixtures" used in the practice of photography. They have been compiled and arranged by the Rev. F. C. Lambert, and we can testify to their great utility. Many of the most useful are in duplicate; several contain numbers and others are left blank. They belong to that order of things of which we can truthfully say that no photographer should be without them.

THE A B C OF PHOTOGRAPHY.

London: The Stereoscopic Company, Limited.

SINCE the first edition of the *ABC of Photography* was issued, now many years since, photography has indeed undergone a well-marked process of evolution. The present edition (the twenty-second) is an entire reconstruction of its predecessors. Besides chapters on the development and general treatment of negatives and prints, it treats on portraiture, retouching, the arrangement of the dark room, lantern slides, enlarging, photo-micrography, instantaneous photography, and paper negatives. Issued primarily in the interests of the Stereoscopic Company, it is—necessarily, we suppose—not absolutely free from the taint of "shop," but it is a good, useful little volume for all that.

GRIMSTON'S INSTANTANEOUS SHUTTER.

This shutter fulfils the condition of having a reciprocating action without the slightest jar during its motion. It is constructed of such thin steel as (together with the sheath or frame in which it slides) to be capable of being inserted in the slit in a lens tube made for the usual Waterhouse diaphragms. The lens mount is thus left quite intact.

The exposure is effected by the rising up of the steel shutter, which raising is effected by the rotation of an arm connected with a spring, a revolution of the arm causing the shutter to rise and fall down with a smooth, gliding motion, and free from all jarring during the entire period of its motion, which may be either slow or imbued with extreme rapidity at the option of the user. The duration of exposure is regulated by very ingenious means; indeed, every part of this elegant little shutter has been carefully thought out and skilfully made. Its scope embraces everything, from the slow movement of an overloaded steambot struggling against the tide to an express train dashing past.

Wratten & Wainwright, 38, Great Queen-street, London, W.C., are the manufacturers of this useful shutter, which can act either by a touch of the finger upon the trigger, or preferably by a pneumatic attachment. Several improvements have been effected in it since it was first introduced to the public, that now before us embodying all of them.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 3139.—"Improvements in Photography and Photographic Reproduction." Communicated by Albert Sichel. Complete specification. A. J. BOULT.—Dated March 1, 1887.

No. 3178.—"An Improved Substitute for Glass for Photographic and other Purposes, and Apparatus in connection with the Manufacture thereof." J. E. THORNTON.—Dated March 2, 1887.

No. 3235.—"Improvements in Photograph and similar Albums and Frames." Complete specification. C. F. FRÄNZEL.—Dated March 2, 1887.

No. 3270.—"An Improved Photographic Camera Stand." J. LANDER.—Dated March 3, 1887.

No. 3393.—"Improved Means for Enabling Unskilled Persons to Produce Artistically Coloured Pictures." W. H. MAY.—Dated March 5, 1887.

No. 3449.—"An Invention by which Pictures, Photographs, or Frames containing Works of Art or other Materials for Exhibition can be Hung to the Wall by Ordinary Picture Rods or Nails." H. DAY.—Dated March 7, 1887.

PATENTS COMPLETED.

IMPROVEMENTS IN PORTABLE PHOTOGRAPHIC CAMERAS AND APPARATUS RELATING THERE TO.

No. 2576. WYNDHAM HARRY PAYNE-GALLWEY, Cromorne Works, Chelsea.—February 27, 1886.

My invention relates to portable photographic apparatus, known as "pocket cameras," and is designed to render the construction of the same sufficiently

compact to allow them to be carried in a portable case, and complete when in use, without loose detached parts; specific improvements being introduced into the chamber or drum containing the sensitive plates, and in its attachment to the camera, and also in the construction of "the shutter" and in other minor details.

My camera consists of the usual photographic camera lens and box, provided with a "shutter," by which instantaneous or any desired prolonged exposure of the sensitive plate may be readily effected, with which is combined a duplicate camera and field plate, adjacent to the photographic camera, by which a duplicate field may be rendered visible to the eye of the operator in use, similar to that which is thrown upon the sensitive plate of the photographic camera.

Both lenses are simultaneously focussed by means of an ordinary tangent pinion and rack. This arrangement serves the double purpose of easy adjustment to any required focus, which, upon being found, is fixed by means of a set screw, whilst at the same time, by the withdrawal of the lens-piece, the external dimensions of the camera are much reduced. A spring shutter is fitted to the mouth of the lenses, so that when withdrawn, the shutter closes over them, and protects them from dirt. The eye-piece of the field-finding camera is telescopic, and spring pressed, so that it may be pressed home, when not in use, to reduce the external dimensions, and which flies out to its proper position, when a detaining detent is released. Within the photographic camera box is placed the "shutter," which is in the form of two hinged doors supported on parallel axes on one of each of their respective edges, and placed at right angles to one another, conveniently vertically and horizontally, so that when one of the shutters—say that in a vertical plane—is rotated on its axis, and thus exposes the plate behind it, the other shutter—say that in the horizontal plane above the vertical shutter—is actuated by a spring, so as to fall rapidly, and immediately thereafter closes the aperture.

To the axis at the lowest edge of the vertical shutter is fitted a milled thumb nut, brought outside the box, and fitted around its axis with a spiral spring, which serves to bring the shutter always to its normal closed position in a vertical plane. The axis of the upper horizontal plate is also provided with a spiral spring, tending to make it close into a downward vertical position. A quadrant is affixed to this axis, bearing with its corner upon a grooved cam upon the axis of the other shutter. When the camera is set for operation, the lower shutter stands in a vertical plane, closing the aperture. The upper shutter is then set by hand against the reaction of the spiral spring, so that it stands horizontally with the quadrant on the axis of the upper shutter pressing against the cam on the lower axis. Upon rotation of the lower axis either by hand or automatically, as hereinafter stated, the sensitive plate is exposed until the cam allows the upper shutter to fall by the reaction of the spiral spring, when the aperture is at once closed. It may be noted that this combined shutter cannot be left open by accident and thus spoil a plate. The aforesaid axis of the lower shutter can be rotated by a rack and pinion, or any similar device which may be actuated more promptly by the mere pressure of a lever or button.

For the storage and supply of the sensitised plates, I attach to the side of the camera a cylindrical drum. The said drum is provided with a series of grooves vertical to the bottom of the drum, around the interior of the outer wall of the box, and around the interior boss, through which a stud fixed to the camera passes, by which the box is attached in place upon the camera. The grooves above described are so arranged relatively to one another that the sensitised plates are arranged partially tangentially to the inner boss, and I thus accommodate a very considerable number of plates in the said box. The box is also provided with a series of indents in an external flange corresponding in number to that of the sheets of sensitised plates, with an additional serration corresponding to one blank space left solid between the boss and periphery in the body of the drum. The cover of the drum towards the camera is fixed relatively to the camera (the drum being free to revolve upon its central axis) and is provided with a slot corresponding in size to the edge and in angle to the position of the sensitised plates in the drum. This plate or cover is also provided with a spring catch engaging in the aforesaid serrated flange on the body of the drum, in order that the position of the said drum, when rotated, may always be exactly determined, so that the divisions in the drum are exactly opposite to the slot in the fixed plate. The slot in this slotted plate or cover is caused, when fitted to the camera, to correspond exactly to a slot in the side of the camera box, such slot being normally covered by a slotted sliding plate, which may be withdrawn or moved so as to cause all the slots to coincide, by means of a spring handle outside the camera box. When it is desired then to supply the sensitised plate to the camera, the sliding plate is withdrawn or moved, so that the slot in the sliding plate coincides with the slots in the drum and the camera, and a sensitised plate can then be delivered by gravity into the camera. When the photograph has been taken, the plate can be returned by tilting the negative plate into its own compartment in the drum. The drum is then rotated through an arc corresponding to a division, so that the next sensitised plate coincides with the position of the slots ready for the next photograph.

The serrations on the external flange of the drum, corresponding to the sensitised plates, are all numbered, and one serration bears the words "drum shut," indicating that position in which the slot of the rotating cover is opposite to the blank partition in the drum. A catch and pointer are provided, affixed to the camera, to indicate the successive numbers. This catch prevents the drum from being removed from the camera until the said pointer is engaged in that serration corresponding to the words "drum shut," in which position the drum cannot be turned any further (which avoids danger of double exposure of any plate), and may be removed, entire and closed, from the body of the camera, by the release of a nut. A duplicate drum may then be attached with a fresh supply, or the plates may be removed in a suitable manner, and a fresh supply of sensitised plates introduced.

It will thus be seen that as the drum can only be removed from the camera in the one position, namely, when the delivery slot is opposite and closed by the blank metallic partition in the box, absolute security is afforded against the admission of light to the sensitised plates before or after the photograph has been taken.

The whole form and external dimensions of my complete camera are, by the preceding construction, within the exterior dimensions of the aforesaid sensitised plate drum and without loose parts when in operation, so that the whole apparatus may be conveniently carried in a portable cylindrical case of the internal dimensions of the cylindrical sensitised plate drum.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
March 15	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
" 15	North London	Myddelton Hall, Upper-st., Islington
" 15	Bolton Club	The Studio, Chancery-lane, Bolton.
" 16	Bristol and W. of Eng. Amateur	Queen's Hotel, Clifton.
" 16	Bury	
" 16	Edinburgh Photo. Club.....	5, St. Andrew-square.
" 16	Hyde	Mechanics' Hall, Hyde.
" 16	Manchester Club	
" 16	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 17	London and Provincial	Mason's Hall, Basinghall-street.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. James Glaisher, F.R.S., President, occupied the chair.

The PRESIDENT said that before the minutes were read he wished the report of the Council, read at the previous meeting and since printed, to be adopted.

Mr. S. G. B. WOLLASTON moved that the report be adopted, with the exception of the clause about the satisfactory hanging of the pictures.

Mr. E. CLIFTON said that he would second this, for the sake of putting the matter to the vote.

Mr. T. SAMUELS did not think the report to be accurate; it said that there were 675 pictures at the exhibition and 198 exhibitors; according to the catalogue the number of exhibitors was 187 and there were 970 exhibits; the 115 exhibits excluded from the report were those on the table, and consisted of apparatus; much more skill was necessary in the designing of good apparatus than in taking pictures. He was against the adoption of the report in its present form.

The CHAIRMAN remarked that the report said that 675 frames were hung.

Mr. T. S. DAVIS moved an amendment that the report be adopted without alteration.

Mr. FRANCIS COBB seconded this, on the ground that no hanging committee ever did or ever could obtain universal approval for its work.

This amendment was put to the vote and carried; twenty-three voted for it and eight against.

The PRESIDENT wished the meeting would express opinions, as requested in the Treasurer's report, about printing the journal twice a year instead of monthly, to reduce expense. He (the President) thought that a monthly issue brought them into closer communication with their members.

Mr. F. INCE thought that the members had not much opportunity to discuss their own affairs; there was a tendency to snuff them out. Every one regretted that Captain Abney, who in the esteem of the Society stood second only to the President, had resigned the Vice-Presidency; he thought that some member of the Council should explain the matter to the meeting.

The PRESIDENT said that if they referred to the *Photographic News* they would see there a letter from Captain Abney giving his reasons for resigning. He resigned because the names of nominators of persons to fill vacancies on the Council were not to be published. A very full Council meeting decided that this should be the case. At the next meeting of the Council Captain Abney was present, and said nothing when the minutes of the previous meeting were read. He hoped he would withdraw his resignation.

Captain W. DE W. ABNEY said that he resigned because the names of the nominators were not added, and because his own nomination list of all the members of the Society was not printed. He had principles he would stick to, come what might, and he thought that the last Council was not constitutionally elected.

The PRESIDENT remarked that Captain Abney nominated all the members of the Society in a printed list to fill six vacancies. The custom had been that any one nominated should be able to fill the office; Captain Abney had nominated some who were dead, some who had failed to pay their subscriptions, and some who were no longer members of the Society. It was utterly impossible and impracticable to have done as he desired.

Mr. WOLLASTON moved that the election be set aside as irregular.

The PRESIDENT refused to receive the motion, because the election had been perfectly regular. New rules should be framed.

Mr. W. S. BIRD said that the rules under discussion had been framed in the most democratic manner possible some years ago, at a time when there was said to be too much power in the hands of the Council. He hoped that Captain Abney would reconsider his determination.

Mr. WOLLASTON said that a friend of his had been nominated to serve without his consent having been obtained.

The CHAIRMAN remarked that such should not have been the case.

Mr. R. M. LAWES stated that he had been so nominated, and he thought the last election to be illegal.

The PRESIDENT then pronounced the adjourned meeting to be closed.

Dr. W. F. DONKIN, M.A., Hon. Secretary, then read the minutes of the last meeting.

Mr. WOLLASTON moved, and Mr. W. H. HYSLOP seconded, that the minutes be not confirmed.

The PRESIDENT put the matter to the vote; twenty-two voted for and five against the confirmation; the minutes were accordingly confirmed.

The PRESIDENT then announced the discussion of Mr. J. B. Spurge's paper, read last month, to be the business before the meeting.

Mr. SPURGE said that he had a rotatory slide rule, connected with the problems in his paper, to bring before the meeting.

The PRESIDENT proposed a vote of thanks to Mr. Spurge, and called upon Mr. Bird to read Mr. Robinson's paper.

Mr. BIRD then read a paper by Mr. H. P. Robinson on *Exhibiting and Exhibitors*. The author said that the quality of the work on view at the annual exhibitions of the Society was improving. Sometimes the same man sent good and bad pictures to one exhibition, showing that the good ones were flukes; sometimes a picture would be hung above a door at one exhibition, and receive a medal at the next one; sometimes the reverse of this would take place. At the last Exhibition were five large frames to show what could be done with a particular maker's camera; as a juror he was not pleased at having to examine all the little pictures in those frames, all sent as an advertisement. Some of the foreign pictures were good but vulgarly mounted. An exhibition must first be made worth visiting by the public, and the pleasing of the exhibitors should be the second consideration. He thought that the names of the exhibitors should be known to the hangers, and that a few pictures should be hung depending for their interest upon the names of the producers: when a man constantly talks photography, writes photography, and tests everything to destruction, it would be interesting to see what kind of work he produces; an impartial hanger, not knowing his name, might reject his work. Persons not members of the Society should pay a little for the space their pictures occupy. When a veteran photographer sends in work, he thought they might in some instances hang his pictures, and be a little blind to their faults. Those who have not the best places on the walls should not attribute the fact to these much-abused persons, the hangers, who had their difficulties.

Mr. W. E. DEBENHAM supposed that the pictures taken with a particular camera were some rather remarkable instantaneous views; he did not see why they should be put away from the other instantaneous views, and he thought that the hangers had acted rightly. Some frames were said to be vulgar; in a matter of taste it was bad taste to call the selections of any one else "vulgar;" it was an unnecessary insult. Many persons liked black frames, and he did not see why they should be excluded. He protested against the suggestion that the hangers should show partiality.

Captain ABNEY said that various caps were flying about, and one of them fitted him, for he had once had a medal awarded for pictures which were subsequently not hung at all when sent to the Photographic Society of Great Britain. He sent in a protest to the Council about the bad work of the hangers, and the Council civilly said that they were very sorry that such merit should have passed unnoticed; at the same time they made him a member of the hanging committee, of which appointment he was very proud. He appeared to perform his duties, and a gentleman said, "What do you want?" He replied, "I have come to hang pictures." The gentleman told him to go away, as he was not wanted, and added that the year before a fellow had sent some very good pictures, which were not hung. He (Captain Abney) explained that he was the man, and the other speaker stated that he was Mr. Robinson; that was their first introduction to each other.

Mr. T. S. DAVIS explained how the hangers would sometimes begin leisurely with their work, guided perhaps by a man of aesthetic proclivities, and afterwards, when time was running short and space more limited, would be guided in the rest of their work by a humble foot-ruler.

Mr. WOLLASTON said that platinotype prints might be marred by being hung against a ghastly head upon pink paper; could not platinotype prints be hung by themselves? He was glad that the craze for bromide enlargements was dying out; he thought such enlargements not suitable for their walls.

Mr. BIRD remarked that Mr. Robinson had applied the word "vulgar" to one kind of mount alone. The hanging was difficult, and must be done rapidly; he thought that Mr. Wollaston would be an excellent hand upon the hanging committee.

Mrs. Mary Pritchard, Sir David L. Salomons, Bart., and Mr. Geoffrey W. Millais, were elected members of the Society.

The PRESIDENT announced that the ordinary meeting of the Society in April would be held on the 19th of that month; that is to say, upon the third instead of the second Tuesday.

The meeting then broke up.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

At a meeting of the above Association, held on Thursday, March 3, at the Masons Hall Tavern, City, London, Mr. A. Mackie presided.

A question in the box asked: "As Boards of Arbitration have been formed to settle disputes in relation to various trades and professions, and are extensively used to escape the unexampled cost and delays of English law, should this Association inquire into the working and constitution of those boards and report thereon for the benefit of photographers?"

Mr. A. COWAN thought that inquiry should be made.

Mr. W. H. HARRISON believed that the appointment of such a board would save photographers the expenditure of much money; in the *Times* law reports of that day was much about such boards, which now had an average of four cases to settle daily; in business agreements a clause was now often inserted agreeing to refer disputes to one of the boards; the board pledged the contending parties not to go to law without its consent.

Mr. W. M. ASHMAN said that the question before the Association at the previous meeting about enlargements might well be referred to such a board. The photographic societies of Great Britain should be consulted about appointing official arbitrators.

The CHAIRMAN remarked that photographers, as a body, had no cohesion whatever, and the society supposed to chiefly represent them, perhaps represented them least.

Mr. A. L. HENDERSON would like to hear opinions from photographers about the appointment of such a board; it was a very important subject.

The HON. SECRETARY thought the subject deserved to be brought up at the next Convention at Glasgow, when a representative of every photographic society in the kingdom would be present.

Mr. HARRISON said that the way to get such a proposition carried through would be for one photographer to take the subject up and make the question his own, doing all the work and correspondence until he had the honour of getting a Board of Arbitration established. As an amateur he had no personal commercial interest in the matter.

Another question was: "Do prints mounted on waterproof mounts cockle? Why not mount proofs with waterproof composition?"

The CHAIRMAN said that undoubtedly they cockled.

Mr. J. HUBERT had had a bad experience with waterproof mounts; prints could only be fixed upon them with gelatine.

Mr. HENDERSON had soaked ordinary mounts in from two to five per cent. of paraffine wax dissolved in benzine. Sometimes he applied this solution after the mounting; it soaked right through the print.

Mr. HUBERT sometimes mounted and dried prints upon boards curved in the opposite direction to that which they would have a tendency to assume after drying.

Mr. COWAN said that good glue was better than inferior samples of gelatine for mounting. All the best professional mounters, including Fox, used glue.

Another question was: "Can wood-spirit be used to precipitate gelatine?"

Mr. HARRISON remarked that pure wood-spirit or methylic alcohol, free from acetone, was rarely seen and very expensive. Ordinary samples were frequently far from pure. It boiled at a lower temperature than ethylic alcohol, and had some useful peculiarities.

Mr. HENDERSON remarked that a commercial specimen before them would give spots if used for precipitation; he, however, knew a New York photographer who invariably used wood-spirit for precipitating emulsion.

Mr. ASHMAN called attention to Mr. T. S. Norris's method of preserving strong solutions of pyrogallol by keeping the upper part of the stock bottle filled with common gas; he had seen a solution which had been kept quite colourless by that method for two years at the City and Guilds Technical College.

Mr. COWAN said that a weak solution could not be kept in good condition by the method stated.

The meeting then broke up.

CAMERA CLUB.

The subject arranged for the Thursday evening meeting of members on March 3 was a demonstration of their carbon process by the Autotype Company. Mr. F. Machell Smith occupied the chair. The attendance was excellent. Both Mr. Sawyer and Mr. Bird were present and spared no pains to make the demonstration thorough and interesting. Every necessary appliance had been brought to the Club, and, in addition, a fine selection of autotype pictures was on view.

Mr. SAWYER introduced the subject by a lecture giving the history of autotype, and then proceeded, with the assistance of Mr. H. J. Burton, to the development of the exposed tissue on single transfer, temporary support, and on collodionised glass. Some very successful results were turned out, the rich colour and fine quality of the pictures obtained by the process proving very attractive.

After the demonstration Mr. J. E. AUSTIN suggested that calcium-chloride tubes might be used with advantage to preserve sensitised carbon tissue. He did not quite understand how Mr. Sawyer proposed in some cases to obtain superior results by taking pictures through the glass side of the plate. He thought the frequent air bubbles in the glass would spoil the negatives. He would like to know whether it were possible to get rid of the glazed surface from the carbon print after stripping.

Mr. W. H. HYSLOP asked what effect gas fumes had upon the tissue.

Mr. V. C. DOUBLEDAY had attempted to make lantern slides in carbon, but had met with great difficulties, and had not been successful. He would like to know the simplest way of going to work.

Mr. G. DAVISON suggested pressing in contact with ground-glass to give a matt surface to the stripped carbon print.

Mr. MACHELL SMITH thought grained zinc would be preferable.

Mr. SAWYER said they had been experimenting in regard to gaining a matt surface. The processes named would no doubt secure the end in view. In regard to Mr. Austin's inquiries, he thought that the tissue did not require the calcium-chloride tube. It might possibly crack if kept in that way. In referring to the superior results obtainable in securing reversed negatives, he meant to convey that improved gradations were to be got by attention in the intermediate process of taking a transparency. The quality of the negative in regard to density could be improved. In reply to Mr. Hyslop, it was necessary to dry the tissue free from gas fumes or it was rendered insoluble. Lantern slides were a weak point. If a negative were the least thin no result bright enough was obtainable.

The proceedings terminated with a hearty vote of thanks to Messrs. Sawyer and Bird and their assistants.

On Thursday, March 17, the subject is *Collodio-Bromide Emulsion*, with demonstration by Mr. H. J. Gifford.

MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of the above Society was held on Tuesday last, in the Masonic Hall, Cooper-street, Manchester, Mr. S. F. Flower in the chair.

The following were elected as members:—Messrs. Thomas Carter, Leslie E. Clift, Geo. Wm. Cook, J. Guilford, Bernard S. Harlow, Arthur Holt, John Irvine, George Moseley, J. Partington, A. Pickston, and John Weir.

Mr. W. RUSSELL exhibited an improved changing bag, the novelty of which consisted of a window of stained parchment. This want, he said, was much felt, and could not be had from the makers.

Mr. T. STEVENTON gave a *Demonstration of Carbon Pigment Development*, but previous to doing so he gave a slight outline of the early history of this process. He then proceeded to develop the prints.

CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

At the recent monthly meeting of this Society, the President in the chair, Messrs. Frederick Heitzman and C. J. Emery were elected ordinary members.

Mr. JESSE WILLIAMS gave an interesting lecture on the *Theory of Development* [this will appear in a future number].

The PRESIDENT, in proposing a vote of thanks to Mr. Williams for his interesting lecture, alluded to the importance of becoming *au fait* as to the action of photographic chemicals. He was afraid many of their members worked by mere matter of rote, and did not take the trouble to ascertain for themselves "the why and the wherefore." He urged them to give more attention to minor details; it was of great importance if they wished to become successful photographers.

Mr. C. F. GOOCH seconded the vote of thanks. The members were interested in the President's account of his recent visit to London and the welcome afforded him by the Camera Club. Arrangements are pending for a visit from Mr. T. C. Hepworth. The President also promised a lecture for next month, illustrated by limelight.

The HON. SECRETARY read a communication from Mr. John Storrie, the Curator of the Cardiff Museum, granting permission to the members to photograph anything of interest, and proffering his kind assistance.

Acting upon a suggestion made by the Hon. Secretary, the Committee of the Cardiff Free Library have courteously added to their lending department a valuable collection of photographic works.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of the Association was held at the Queen's Hotel on Wednesday, February 16,—Colonel Playfair, Vice-President, in the chair, and there was a large attendance, a paper on *Film Photography*, by Mr. Manfield, having been previously announced.

The HON. SECRETARY (Mr. H. A. Hood Daniel) intimated that it would be desirable to pass the printed minutes of January and February at the next meeting, as the issue of the former had been much delayed by the yearly re-arrangement of the advertisements.

Mr. E. BRIGHTMAN was called on by the CHAIRMAN to read Mr. Manfield's paper, that gentleman being absent [see page 152].

Mr. J. PHILLIPS inquired as to time required for final washing of the negatives.

Mr. BRIGHTMAN stated that the time required was much less, as the water got at the film from both sides at once.

Mr. BOORNE remarked that the Eastman people stated fifteen minutes as being sufficient for that operation.

Rev. II. B. HARE inquired why the ammonia should attack the film.

Mr. BRIGHTMAN replied that it was the combined action of the ammonia and pyro which was referred to as *toughening* the film of gelatine too much.

Rev. H. B. HARE considered that if a film was likely to frill at all such was less likely with ammonia than with soda.

Mr. BRIGHTMAN said it was very noticeable how many were now writing and complaining of the frilling of plates, but doubtless they were in most cases using Beach's developer, a very potent producer of that trouble.

Rev. II. B. HARE had experimented with the Beach developer, but had not succeeded so well as with ammonia.

The CHAIRMAN had not succeeded with the Beach developer anything like so well as with ammonia, his chief complaint being that it stained the film so much.

Rev. H. B. HARE considered that the chief objection to ammonia was its considerable and rapid reduction in strength.

Mr. STEVENS advocated keeping it in a ten-per-cent. solution, a very convenient mode for obviating the defect Mr. Hare mentioned.

Mr. DANIEL said that he considered a ten-per-cent. solution somewhat awkward, say, in the case of a solution desired to be made of seven to one. He much preferred the mode of diluting ammonia immediately on its receipt with equal bulk of water and so labelling it. Any strength solution desired could then be made.

Rev. II. B. HARE saw a good mode recommended for keeping the stoppers of bottles tight, namely, to place them upside down in a pan of water.

The CHAIRMAN proposed a vote of thanks to Mr. Manfield for his very interesting and instructive paper, and could not help feeling that after seeing the very beautiful specimens exhibited the days of glass were numbered.

The vote of thanks was passed unanimously and cordially to Mr. Manfield for his instructive paper, which was listened to with much attention.

The CHAIRMAN proposed that, as the Association Room was open to members at any time during the day, the following papers should be regularly taken and kept on the table:—THE BRITISH JOURNAL OF PHOTOGRAPHY, *Photographic News*, *Amateur Photographer*, and *The Camera*, which, having been duly seconded, was carried, after which the meeting was adjourned to March 16.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held at Myddelton Hall, Islington, N., on Tuesday, March 1, Mr. J. Traill Taylor, President, in the chair, Messrs. W. Ackland, W. Bedford, E. Dunmore, E. W. Foxlee, D. W. Hill, J. Martin, and G. W. Shadbolt, members of the former North London Society, were elected honorary members, and Messrs. Harold Imray and H. H. Dimmock were elected as ordinary members.

A letter was read from Mr. Eric H. Johnson, of Putnam, Conn., U.S.A., offering to exchange prints with members of the Society.

A question from the box was read, asking the best method of making oxygen.

The PRESIDENT described the ordinary method of making oxygen from chloride of potash and manganese.

Mr. E. CONRAD said that the addition of chloride of sodium had been recommended.

Mr. E. CLIFTON drew attention to the fact that oxygen was now being commercially produced by the Brins Oxygen Company, by the barium-oxide process, at a very cheap rate; oxygen so prepared did not contain chlorine, and therefore did not destroy the gas bags.

A question was then read, inquiring the cause of and remedy for collodion emulsion which gives crapy lines on coating the plate.

Mr. A. MACKIE suggested that either the solvents used were not of sufficiently high specific gravity or that the pellicle had not been sufficiently dried before redissolving. He added, that with some samples of pyroxyline this fault was more likely to occur than with others.

Mr. L. MEDLAND showed a new lens mount he had constructed for converting his rapid symmetrical into a wide-angle lens. He also showed an auxiliary focuser for use in instantaneous work.

In the adjourned discussion on Mr. Taylor's lecture, Mr. F. W. COX asked whether the composition of the glass used in the manufacture of lenses influenced their rapidity, focal length and aperture being the same.

The PRESIDENT replied that, provided the glass was colourless, there would be no difference.

A MEMBER said that he had a portrait lens which gave a flare spot under any circumstances, and wished the President to give the reason.

The PRESIDENT thought this hardly possible, and suggested that the lens be brought to the next meeting for examination.

Mr. MACKIE said that, considering the importance of the lens, it was astonishing how ignorant photographers were of the simplest facts concerning its properties and use, and suggested that a few axioms applicable to lenses in general, whatever their construction might be, should be published in one of the photographic journals.

A large number of interesting slides was then shown by means of the optical lantern.

The next meeting will be held on Tuesday, March 15, when Mr. Edgar Clifton will deliver a lecture on *Cameras, Ancient and Modern*. Visitors are invited.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

The usual fortnightly meeting of this Society was held at the Greyhound Hotel, Dulwich, on Wednesday evening, March 2.—Mr. Wolf in the chair.

After the usual business had been transacted, Mr. WALKER gave a description of the Eastman stripping films and their manipulation. The whole of the processes were shown practically by Mr. Jackson, the Company's demonstrator, and were entirely successful. Mr. Walker showed a series of reproduced negatives on the films made by Mr. A. Pringle, which were quite equal to any on glass.

The next meeting will be on Wednesday evening, March 16, when a communication on bromide-paper will be made by Mr. A. Ryder.

Correspondence.

Correspondents should never write on both sides of the paper.

FEBRUARY MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE.—GELATINO-CHLORIDE PROOFS AND EMULSIONS.—A NEW STRETCHER.—A TRIPOD WITH ARTICULATE CENTRE.—ANOTHER MANUFACTURER OF DRY PLATES.—BUSINESS DEPRESSION.—EASTMAN'S PAPER AND TONING OF PRINTS BY PLATINUM.—A NEW SHUTTER.—A SMALL CAMERA.—PORTRAITURE BY ELECTRIC LIGHT.—REVERSIBLE FILMS.—SILVERING GLASS PLATES.

The Photographic Society of France held their February meeting on Friday evening last, the 4th instant, M. Davanne in the chair.

M. Tondeur presented a collection of positives on glass, made by his new gelatino-chloride emulsion. He said he was very happy to be able to add that it was a Frenchman who was the first to present gelatino-chloride emulsions to the French Society of Photography. Here a storm of interpellations fell upon the unhappy author. MM. Franck, Guilleminot, and Stebbing said that they had manufactured gelatino-chloride plates, and that proofs had been presented to the Society. M. Tondeur took to the safe side by saying that if the results from gelatino-chloride emulsions had been exhibited, no emulsions ready to be used had been shown. M. Tondeur states that he has discovered a new and novel method of making emulsions in full light, and that upon going into his dark room rapidity is acquired instantaneously. These emulsions can be kept for a length of time without decomposition. M. Tondeur had promised to endow the public with his secret, by divulging it to the French Society of Photography, and it was even published upon their programme; but at the last moment this gentleman preferred to keep his secret to himself, and disappoint the members who went to the *séance* on purpose to learn another method.

M. David presented a stretcher for films composed of a brass frame, as in those already known, such as Londe, Eastman Company, &c. The only thing new is that no flaps are required to turn down upon the film. The film need not be larger than the size required, and is held by the following expedient:—Round the edge of the brasswork frames M. David had the idea to punch a line of holes; the rough surface of these holes act like pins, prick into the film, and hold it firm. When the stretcher is put into the dark frame, the door being closed pushes upon the stretcher and flattens it down; this flattening makes it become larger, and causes the

film or paper to become stretched like a drum-head. For myself, I cannot recommend stretchers which make holes in the sensitive surface. The only inconvenience I see in the folding-down ones is that the films must be purchased of a larger size than required, thus making them a little more expensive.

M. Horn presented a camera tripod with an articulated contrivance in the centre, such as was presented to the Society in the month of December by M. Lebreton, and of which I gave a full account in one of my letters to THE BRITISH JOURNAL OF PHOTOGRAPHY. Since the value of that addition by M. Lebreton has been established, other inventors claim the honour of having invented it; one among the rest claims the honour for his old master, one of the first manufacturers of photographic cameras, long ago dead and reposing from his labours. As it is, the dodge is a good one; and if it has been forgotten and in disuse, it must be brought before the photographic community again as a very useful addition to the well-known tripod.

M. Offert, a new manufacturer of gelatino-bromide of silver plates, presented specimen packets to the members in order to be experimented upon.

Plates are at such a low price on the Continent, and makers so numerous, and business so bad, that plates of any brand and at whatever price are equally disdained. The proprietor of one of the best houses in Paris, on being asked to give work to an operator, replied that he had been obliged to discharge hands, and that he could not find work for the operator remaining. On being asked the cause of this dearth of customers, he replied that although photography had made such rapid strides in beauty and artistic taste during the last two years, it appears that the public has become indifferent altogether to photography. Formerly, said he, albums could be seen upon every parlour table; now coloured illustrated journals take their place. Amateurs torment their friends to sit as models, photographers bother actresses and artists, as well as prominent personages, to honour them with a sitting; so at last, if things go on in the same way, we shall be obliged to fee our customers instead of their paying us. A little exaggeration can be accounted for, but this is not the only instance.

M. Chenevière presented a collection of positives on Eastman's paper, as well as some enlargements having a very agreeable tone, having been passed through a bath of platinum. To M. Vidal is due the popularisation of this method of toning, which he described as follows:—In order to make positives printed upon Eastman's paper more durable, they can be toned with platinum, the same as those printed upon albumenised paper are toned with gold. After having developed the image in the ferrous-oxalate bath, it is thoroughly washed in water acidulated by acetic acid, and it is then immersed in the following solution:—

Water	2000 parts.
Bichloride of platinum	1 part.
Hydrochloric acid	25 parts.

The proof can be left in this bath from twenty minutes to half an hour. It is well to print the proofs a little deeper in shade, as they lose a little of this vigour in the toning bath. If the operator is not sure of the action of the platinum salt upon the proof, let him cut off a small piece of the proof, and immerse it in the following solution:—

Water	1000 parts.
Bichloride of copper	120 "

If the image is covered with platinum, it will resist the action of this bath, but if it has not been properly toned it will fade away completely. The paper need not be thrown away, as the image can be redeveloped by plunging it into the ferrous-oxalate bath. Not only will it redevelop in all beauty, but it will give a brighter and a better image than it did after its first development. The action of the platinum toning solution ameliorates and modifies the tone or colour of the prints, which take a fine bluish-black colour. After having fixed and well washed the proofs, they must be allowed to remain at least ten minutes in the following solution:—

Water	1000 parts.
Alum	50 "

M. Marco-Mendoza presented a new shutter of his invention, with which he declared he was able to make different exposures, from instantaneous to minutes. This instrument is made after the principle of Watson's rapid shutter; when one flap rises up another falls down, and thus the obturation is obtained. M. Londe objected to this system, as being faulty in the extreme. He said that it was practically impossible to avoid a shaking of the camera with a shutter which opens, and at the moment when the image is half exposed lifts a catch, which liberates a second flange to close the lens. The inventor, with great tact and dexterity, turned the laugh on his side, by wisely saying that he did not pretend to say that his shutter was superior to that of M. Londe, which was a commercial article.

M. Français presented a small camera for instantaneous work, 2 × 2. The camera is intended to be held in the hand during the operation. The lens is of a fixed focus, therefore automatic; an instantaneous shutter is adapted. Above the working lens is another small lens, which acts as a camera obscura. The image is reflected upon a ground-glass inserted in the top of the camera, so that the position of the object can be ascertained, and its movements seen all the time. This ground-glass is protected by a kind of covering lying flat when closed, but when opened

forms a sort of tent or shade. M. Français has given it the name of kinégraph.

Professor Stebbing presented some magnificent proofs obtained by a new combination of the electric light in the studio of M. Chary (late Walcry), of Paris. The proofs were so to the taste of some of the members, that notwithstanding the expressed wishes of the President to return them several were missing. The French Society would do well to copy the English societies, in having a book in which to write the names of members and visitors, and by whom introduced; these petty larcenies would not occur so frequently; strangers being admitted up to the present without any control. Readers of THE BRITISH JOURNAL OF PHOTOGRAPHY interested in electric lighting can read a short description of M. Chary's method in one of my former communications.

M. Balagny presented some very fine specimens of his reversible films. M. Bory sent in a communication on the silvering of plate glass. It being very late it was ordered to be published in the *Bulletin*.

25, Rue des Apennins, Paris.

PROF. E. STEBBING.

RETOUCHING.

To the Editors.

GENTLEMEN,—With the sentiments expressed in last week's JOURNAL by "Over-weary" I can heartily sympathise, having often felt that way myself.

Of course, employers naturally expect a maximum of work with a minimum of pay, and that is responsible for a good deal of the wretched retouching produced. When a man is expected to finish so many heads a day, be they rough or smooth, he cannot have any time to think what is best to be done, but must simply put the polish on as rapidly as possible. To stick at that polishing process day after day, and week after week, is almost maddening in its monotony. Such work (though often regarded as the easiest) is dreadfully wearing, not only to the eyes but to the nerves and body generally, and should certainly be better paid for than it frequently is.

I should like to ask Mr. Barrett what he considers a fair day's work? Doing the negatives well, and working, say, from nine a.m. to six p.m., with an hour off—I am well aware that some negatives take twice as long as others, but taking the rough with the smooth—how many *carte-de-visite* vignette heads ought to be done in the time?

On applying for a situation I have been told that unless I could do a certain number of heads per diem I would not suit. Is that sort of thing quite fair? Then, after literally slaving all the summer, as the winter comes on you may be informed that the small amount of business doing does not justify the retention of an expensive assistant, and, with many regrets, out you go. That sort of thing is hardly an encouragement for men to persevere in the profession.—I am, yours, &c.,

HYDRA.

To the Editors.

GENTLEMEN,—In last week's issue of THE BRITISH JOURNAL OF PHOTOGRAPHY there are two of your correspondents who have very kindly mentioned my name, and to whom, with your indulgence, I wish to reply. One, "Over-weary," has only added his testimony to the justice of some of my remarks in a former issue of your JOURNAL, and for which I beg to thank him; but the second, Mr. H. J. Gorfin, "calles me over the coals" because I said "that Mr. Williams," of Regent-street, "retouched his negatives." Whenever I am wrong I am only too happy if any one will kindly correct me. Personally, I have always regarded Mr. Williams as a photographer second to none, and I cannot find anything in my article to the contrary, but I hope Mr. Gorfin will forgive me if I stick to my opinion regarding Mr. Williams retouching his negatives. As I said, I may be wrong, and if Mr. G. Croughton (an artist of the time in question, and also one whom I regard as an authority on retouching) will condescend to tell me that I am, I will be very happy to acknowledge my error and make the *amende honorable*.—I am, yours, &c.,

REDMOND BARRETT.

SULPHURATION OF PLATINOYPE PRINTS.

To the Editors.

GENTLEMEN,—I do not wish to trouble you further in reference to this controversy; it is evident to me that, as of old, the people will be deceived, and that they "love to have it so." Very well, let them. But I wish you to place on record that in compliance to a request by me to Mr. Pringle that he would state publicly the grounds for his public statement (absolute) in your pages (December 3, 1886), he has sent me a private letter, in which he says: "You appear (*sic*) to find fault with my statement that the 'metal platinum forms but a small proportion of platinotype print.' Will you kindly weigh it, and then say what proportion of the total weight is due to the paper and what to metallic platinum?" Now, gentlemen and readers—those who do read—I want you to turn to Mr. A. Pringle's letter, published December 3, and then to form your opinions upon the justice and honesty of the combating parties. If I were to write a "trilogy of letters," I could not come up to—or go down to—the level of this remarkable interpretation so long forthcoming. Again I say, read the letter from Mr. Pringle, published December 3.—I am, yours, &c.,

HERBERT B. BERKELEY.

P.S.—I should add that Mr. Pringle further states that he doubts the composition of the image—especially since writing the "absolute statement," but he does not give any reasons. There is an error in eighth line, second paragraph, of my letter, February 18—for any read no.

LIMELIGHT MATTERS.

To the Editors.

GENTLEMEN,—I shall be glad if you will allow me to say, in answer to Mr. Lewis Wright's letter of last week, that the automatic valves in question do fulfil their title by acting perfectly when attached to the ordinary pressure gas cylinders, even when all the taps of jets, &c., are turned off and the regular valve is unscrewed and open. This I tried to express in my remarks when I said "that a gas cylinder with an automatic valve attached is practically the same as an average weighted gas bag." I shall have much pleasure in showing those interested the automatic valves in operation if they will call at 406, Strand, London, and, providing a few hours notice is given, will have a triple or biunial lantern set up in the dark room with identical optical systems and jets, so that the light from the gas cylinders and gas bags could be compared. When using mixed jets with the extra high-pressure gas cylinders recently introduced, it is somewhat more difficult to control the flow of gas and prevent it accumulating when a tap is turned off as it would be in dissolving; but when it is considered that the pressure in the steel bottles is 1500 pounds to the square inch this is not to be wondered at, and notwithstanding the difficulties to encounter there is every chance that the inventor (Mr. R. Beard) will succeed in overcoming this. As, however, an iron bottle or gas cylinder twenty-eight inches long and five and a half inches diameter can be filled with twenty cubic feet of gas at a pressure of about six hundred pounds to the square inch, and as the valves act perfectly in checking the flow at this pressure, there seems no necessity when required for dissolving to have the extra quantity of gas pumped in the cylinders.—I am, yours, &c.,

March 7, 1887.

G. R. BAKER.

EOSINE IN ISOCHROMATIC PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—We need trouble you with no reply to Mr. Hyslop's letter in your number of February 25. His "statement" is, this time, quite correct; there has been no transfer of the patent, therefore he would be hardly likely to find a record of the transaction. Nevertheless, it is a fact that we are the sole licencees for the use of eosine in the gelatino-bromide process for Great Britain and the Colonies.

With regard to Dr. Vogel's specification which has just been published, we have to inform your readers that the application has been opposed and all proper steps taken to prevent an English patent being granted, on the ground that it is a direct copy and infringement of Tailler & Clayton's patent, dated January 8, 1883, under which we hold our licence.

In reply to the suggestion of a correspondent, Mr. H. A. Lewis, that we should supply the eosine preparation for the purpose of rendering ordinary plates isochromatic by the bath process, we beg to explain that we do not use or recommend this method, which is troublesome and complicated, for the simple reason that plates so prepared will not keep, whereas, by our method of making the emulsion itself isochromatic in the first instance, the plates are not only of superior quality, but they also have all the good keeping qualities of the best gelatino-bromide plates of the ordinary kind.—We are, yours, &c.,

B. J. EDWARDS & Co.

The Grove, Hackney, London, March 8, 1887.

A DISCLAIMER.

To the Editors.

GENTLEMEN,—I was as much surprised and puzzled as your correspondent Mr. England, at seeing the curious remarks said to have been made by me at a recent meeting of the Leeds Photographic Society. I certainly did not say amateurs had a monopoly of artistic treatment of their subjects, or any advantage whatever over the professional, except in so far as they may have a greater freedom of choice of subjects; that is, they can refrain from trying to make pictures of what is unpicturesque.

With regard to the second statement fathered on me, what I did say was, that, having had to pass some time in a certain not very high-class establishment at one time, and noticing the general absence of beauty (to use a mild term) in the class of persons who frequented it, I thought the professional photographer was to be pitied who was expected to invest such rooms with artistic appearance. On this point I may mention that yesterday I met a professional friend, who, after telling me he had had a hearty laugh over my (supposed) observations, added, "But what you say is quite true, and had I been present I should have spoken even more strongly on the subject."—I am, yours, &c.,

12, Park-street, Leeds, March 8, 1887.

A SUGGESTION.

To the Editors.

GENTLEMEN,—The system of piracy, as carried on now and for years past, demands a remedy. Of course, the remedy is to have any portrait registered, but in daily practice the time taken up in sending to the office in London is an objection. The plan I offer is, that it should be possible to register a photograph in any town at the stamp office. It would bring in a considerable revenue, as, doubtless, it would be taken advantage of by all respectable photographers. If you think it worth attention, please put it in your valuable JOURNAL.—I am, yours, &c.,

Cheltenham.

AN ARTIST.

Exchange Column.

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

Will exchange half-plate Lerebour portrait lens, with Waterhouse diaphragms, for half-plate wide-angle rapid rectilinear lens.—Address, J. GOODMAN, New-street, Farsley, near Leeds.

Will exchange quarter-plate mahogany camera, one single dark slide and double combination portrait lens, for strong tripod stand suitable for 12×10 camera.—Address, TRIO, 123, Southgate, Gloucester.

Will exchange a Lawley's portrait lens, with sliding-body camera and one single slide, for Lancaster's quarter-plate instantograph.—Address, W., 8, Westfield-terrace, Sheffield.

Will exchange a dark photographic carriage on wheels, completely fitted up (cost £10). Wanted, half-plate long-focus folding camera, with three or more double backs.—Address, J. W. SMITH, 71, Seagate, Stamford, Lincolnshire.

Vogel's carte and group lens, two and a quarter inches diameter. Wanted, offers in ferrotype stock.—Address, Mr. ASULEY, 29, East-street, Stonehouse, Devon.

Wanted to exchange, phantom shutter (hardly used), suitable for Ross' 5×4 rapid rectilinear lens, for Watson's cyclist's tripod and stand.—Address, E. MANKS, Royal Aquarium, Westminster, S.W.

Wanted to exchange, gem camera, nine lenses, to take thirty-six pictures on 7×5 plate (cost eight guineas), for a good whole-plate rectilinear lens.—Address, A. GATES, Photographer, Market-street, Aberdeen.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although no necessity for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED:—

W. D. Valentine, Dundee.—Two group photographic views.
G. & H. Hall, 26, Westgate, Wakefield.—Photograph of testimonial to W. Aden Cas.

PAINTER.—Unless we knew the focus of the front lens we could not answer. But it will cover a whole plate at any rate.

AMOURETTE.—Try another sample of paper having a less highly glazed surface, or dry the prints between blotting-paper, so that they do not curl up in drying.

A. WILSON.—With that dusting-on formula you ought to succeed. Probably you do not allow the plate, after being exposed, to remain sufficiently long in a damp place.

HYPO.—1. Any strong tricycle will answer, but we cannot indicate a special make.—2. Brown holland will answer.—3. Advertise for an artist. There are many who would willingly undertake the work.

RAPID PARAGON.—1. Yes, there is a difference in the construction.—2 and 3. The components of either of "Rapids" used as a single lens will be all that you require.—4. The bayonet joint is the more convenient.

HYPO.—The spots are evidently due to sulphur. Probably air-bells have become imprisoned between the prints while in the fixing bath, or perhaps in the first washing water. The injury is quite as liable to occur in the latter as the former.

S. S. S.—1. To remove the stains try sulphuric acid (diluted) and alum.—2. Have the background repainted. We are preparing an article on the subject.—3. Either of the lenses will answer, but we would give preference to the one having the shortest focus.

C. J. S. B.—Write to Messrs. England Brothers, Charles-street, Royal-crescent, Notting Hill; they are the printers. Husnik's work on the collotype process (in German) may also be of service to you. It may be procured through Messrs. Trübner & Co., Ludgate-hill.

F. JOHNSON asks: "Can you please to inform me, through the 'Answers to Correspondents,' if there is any method of securing rich purple tones with Cowan's chloride plates for transparencies? and if so, kindly give formula, and oblige."—Perhaps Mr. Cowan will kindly supply the desired information.

LUX.—Probably pure hydrogen, obtained by dissolving zinc in diluted sulphuric or hydrochloric acid, would serve the purpose. The special virtue in employing dry pyrogallic acid in the way described lies in its being always fresh. It is usually measured in a small scoop when lifted out, instead of being weighed. The strength can always be nearly estimated.

J. HARRIS inquires: "Will you kindly give an arithmetical example to show how to divide the diameter of stop into the focal length of lens?"—We reply: Having ascertained the focus of the lens—which is, say, ten inches—and the diameter of the aperture in diaphragm—which we shall assume to be half an inch—you have next to compute how many half inches there are in ten, and then mark that particular stop as $\frac{1}{2}$.

H. H. NEWMAN asks: "Would you kindly let me know, through the JOURNAL, where I can get a good pyrotechnic lamp for artificial lighting, also a magnesium lamp for the same purpose?"—Those who employ pyrotechnic compounds usually have a lamp constructed according to their special requirements. Mr. F. W. Hart, of Kingsland, and Messrs. Solomon, of Red Lion-square, both supply magnesium lamps.

W. S. writes: "Will you kindly inform me, through the JOURNAL, the cause of the film of the enclosed negative going as it has? I developed with the developer given by Mr. Pringle on page 90 of the JOURNAL, with the exception that instead of using bisulphite of potash I used sulphurous acid and carbonate of potash. The exposure was eight seconds with a wide-angle lens."—The appearance of the film is due to incipient frilling, brought about, no doubt, by the employment of an excess of potash. This our correspondent can prove for himself by trying some of the same plates with a developer made up according to the formula given by Mr. Pringle.

J. H. T. ELLERBECK writes: "In the report of the Liverpool Amateur Photographic Association, just issued, my name appears as an honorary member. As this is open to misconception, I ask you to allow me to state that, although repeatedly offered this, I have most emphatically refused the honour (?), the acceptance of which, had it been of any use to me, would have been an acknowledgment of the legality and justice of their late decision."

J. H. J. says: "I wish to enlarge from quarter and half-plate negatives to about 12×10 on bromide paper by daylight. Would you kindly tell me what kind of lens would be the best? I have a Ross' half-plate rapid symmetrical, and my camera racks out to sixteen inches. I have never done any enlarging."—The lens named will do quite well, but in enlarging from the half-plate negatives a stop will no doubt be required.

A MEMBER of the Bolton Photographic Society informs us that, *apropos* of the report given in our JOURNAL last week, the awards at the annual *soirée* were as follows:—No. 1, Photographs taken during the season: 1st, Mr. E. N. Ashworth; 2nd, Mr. C. K. Dalton. No. 2, Photographs taken at outdoor meetings this season: 1st, Mr. C. K. Dalton; 2nd, Mr. W. Laithwaite. As regards No. 3, that for Lantern Transparencies, there was practically no competition.

KU KLUX.—It will quite well suffice if the small camera be placed on a strip of wood of twelve to eighteen inches long, with pieces at either end against which the camera may be placed in succession to ensure parallelism. It is only when a very near object is to be photographed that the bars are required to converge towards it. Eye-pieces of the kind spoken of cost seven shillings and sixpence the pair, unmounted. If you fail to obtain them, write again.

W. D. asks: "Will you kindly inform me if good methylated spirit will answer in the place of the large quantity of alcohol mentioned in Henderson's cold precipitation process for making gelatine emulsion? I mean the eight ounces of alcohol with which the gelatine and silver are mixed, and which is nearly all recovered."—Methylated spirit will answer the purpose quite well. Of course what is known as "methylated finish" will not do at all. This latter is often sold for the former by some oilmen.

A CONSTANT READER (Hammersmith) writes thus: "Will you kindly inform me, through your valuable JOURNAL, whether a plate exposed, say, fifteen seconds on a day like last Saturday out of doors would take a long time to develop and only produce a picture without contrast?"—As we do not happen to know the quality of the light in our correspondent's neighbourhood on the day named, or the lens employed, or any other particulars, we are unable to give an opinion. We surmise, however, that the plate was under exposed.

SPECTRUM puts the following query: "How are the glasses in a lens fastened together?"—In reply: Lenses are usually cemented together with Canada balsam; occasionally castor oil has been used. The lenses may be cemented as follows:—Make the glasses thoroughly warm, then place a drop of the balsam in the centre of one, by preference the concave—supposing one to be concave; next press the other upon it so as to force out all the balsam possible. After this the lens must be placed in a warm situation till the balsam becomes hard.

WASHING MACHINE writes: "Would you enlighten me, through your 'Answers to Correspondents' column on the following:—I am making a print washing machine with zinc; would it do to leave the zinc bare or should it be coated with something (the inner tray at least)? if so, what would be most suitable?"—In reply: Many washing machines are used with the bare metal, and when the zinc becomes coated with oxide it is scarcely likely to injure the prints, provided the major portion of the hypo is washed out prior to their immersion. The safest plan will be to cover the zinc with one or two coatings of Brunswick black. We ourselves never employ metal vessels for washing silver prints, as we much prefer porcelain or earthenware.

FOG writes: "Would you kindly, in your column 'Answers to Correspondents,' tell me the cause of the indistinct appearance of the image on the enclosed piece of Eastman's paper? It is enlarged from quarter-plate negative. I need hardly say that it has neither been properly washed or fixed, as it is the third I have made with similar results. The image came up slowly and refused to further develop. I have rigidly carried out instructions in regard to developer. I think it is not owing to fog from light in enlarging camera, which is a room made entirely dark excepting what passes through negative. The paper was fixed on carrier for holding it by means of ruby light."—Supposing the paper has not been exposed to extraneous light during its manipulation—and from the appearance of the print we have no reason to suppose it has—there is very little doubt but that the exposure has been far too short. Try the effect of at least three times the exposure.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, March 16, 1887, will be on *Outdoor Outfits*.

The Scovill Manufacturing Company, New York, have favoured us with a richly-bound library edition of their *Times Annual*, which we have no hesitation in stating to be the most elegant volume connected with photography we have ever seen emanating from the New World.

A FRIEND sends us a newspaper cutting containing a very full account of the annual *soirée* and exhibition of the Glossop Dale Photographic Society. There are some things in it which we will take occasion to utilise shortly.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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BACKGROUNDS.

A QUESTION which at the present time appears to be exercising the minds of many modern amateur photographers—if we may judge by the number of inquiries on the subject we have received of late—is, the best kind of background for portraiture to adopt in the coming season. The background of a picture is one of its most important features—a fact too often overlooked by photographers, though not so by painters. In connection with this subject, it is related of a celebrated artist that when a lady, anxious for her son to become a pupil of his, suggested that the lad might perhaps commence by painting the backgrounds, the famous artist replied to the following effect:—"Madam, if your son can paint my backgrounds he requires no instruction from me, for I find the background the most difficult part of the picture." However, it is not with the æsthetic part of the question we are now going to deal, but the practical.

Every photographer should possess at least one plain background, and with this, judiciously used, may be obtained far more artistic effects, and a greater variety of them, than is possible with the larger proportion of the scenic ones now in use. It must not be assumed by the uninitiated that because a background is a plain one it must necessarily appear of a flat, even tone in the photograph—this would be a fallacy. Those who are familiar with the portraits by the late Adam Salomon are fully aware of what can be accomplished, artistically, with plain backgrounds. The essentials of a plain background are that it should be of a flat and even tint. It should be free from creases and streaks, and possess a dead, or non-reflective, surface. Its colour, and the material of which it is composed, are of secondary importance, provided it has the proper photographic value to render the tint or tone required in the picture. The same background, it may be mentioned, can be made to appear either lighter or darker, according to the amount of light that falls upon it. We shall now briefly describe different kinds of plain backgrounds which have been, and now are, employed in portraiture.

The almost universal background of the amateur of old was an ordinary blanket. It answers fairly well, provided it be old and somewhat yellow in colour, otherwise it will prove too light for general purposes. Woollen backgrounds, of various tints, may be obtained at most photographic warehouses. These answer admirably, and are very convenient, as they can be folded up without becoming creased, but they harbour dust and are liable to be injured by moth.

A very useful background, particularly for groups, may be

formed by papering the end of the studio with plain paper, or a wooden frame may be covered with canvas and that papered. Plain paper, of almost any colour or shade, can be obtained from the manufacturers of paper hangings under the name of plain grounds. This is paper merely coloured with the ground colour before the pattern is printed. A background thus made is uniform in tint and very durable. It is also inexpensive. A piece of common brown paper forms a capital background, especially for vignettes, and is cheap. Suitable paper, under the name of carpet paper, about five feet wide and of any length, is supplied, at a few pence per yard, at all carpet warehouses.

One of the best backgrounds that a photographer can have, so far as durability is concerned, is one in flatted oil colour. If a background be simply painted with ordinary oil paint it will prove too glossy, hence the gloss has to be destroyed. There are different ways of accomplishing this. One plan which we have seen adopted is, to sift over some fine dry sand after the paint has been applied. This is absorbed by the wet paint, which then dries without gloss. Another way is, when the paint has just become tacky, to dust over the surface some flock—such as that used for wall papers—of the same colour. This plan answers well. The flock may be obtained from the dealers in artificial florists' materials.

The most general method of obtaining a dead surface on oil colour is by turpentine flattening, which is done as follows:—After the background has been coated with ordinary paint and become dry, it is gone over again with some of the same colour, but this time mixed with turpentine only. By this means the glossy character of the paint is destroyed and the surface left dead. It requires some small amount of skill to apply this coating without leaving the marks of the brush, particularly in hot weather, owing to the volatility of the turpentine. Hence, in flattening a background, it is usual for one person to apply the colour while another stipples over the surface with a large badger-hair brush. Another method of making an oil colour background is by what is known as soap flattening. This is common oil paint mixed with a strong, hot solution of soap. This when applied as ordinary paint dries with a dull surface. It is somewhat troublesome to prepare, but the novice is more likely to succeed with it than with the turpentine flattening just described.

Distemper backgrounds are easy to make, and are very generally used. In this case, the colouring matter is mixed with size and water, and applied with a common whitewash brush. These backgrounds are quite as good as those in oil,

except that they are far less durable. If a distemper background becomes wetted—as by a leaky roof—a stain, which of course will show in the picture, is produced. This cannot be got rid of without applying a fresh coat of distemper. Also the surface is easily injured by abrasion; a slight rub with any hard substance will produce a mark. If a background be coated many times with distemper, the accumulated colour is liable to crack, and, sometimes, to peel off. This never happens with a flatted oil one.

There is a very simple method of producing backgrounds which is well suited to the amateur, though it appears to be little known or seldom used. It consists in applying colour mixed with dextrine or similar material, as a dry powder to wet canvas, and then working it in with a brush. Backgrounds of this description are very durable, and are easily repaired should they happen to get injured either by water or by abrasion.

STAR PHOTOGRAPHY.

THE Conference of Astronomers arranged for Easter next for the purpose of discussing plans for a concerted system of photographing the whole of the starry heavens, will arouse so much attention, both among photographers and the public generally, that some account of what has been done already in this field of work will be interesting to the majority of our readers we do not doubt. We have on sundry occasions brought under our readers' notice the various wonderful achievements of modern photography in astronomical recording—representations of the solar surface and spectrum, lunar, cometary, eclipse, and transit photographs—all have excited vast attention, and we have kept our readers *au courant* with their leading details. Now, however, we would address ourselves to star photography only.

The project at present before the astronomical world is, briefly speaking, the division of the whole of the sky into a certain number of sections, each observatory devoting itself to one particular section, and, by degrees, obtaining a number of negatives embracing in the aggregate the whole of the allotted space. What is required is concerted action, and it is hoped that the Conference may devise a suitable plan for securing it.

As to the actual operation of photographing the stars, it is, primarily, simple enough, though the details are laborious. It is neither more nor less than treating the stars in the same way as a landscape, and exposing the plate to the image for a suitable length of time. The difficulty is twofold: first, a very long exposure is needed to obtain stars of small "magnitude," as it is termed—that is to say, of small apparent illumination—secondly, the objects, unlike a landscape, are continually moving away, or at least appearing to do; hence in a long exposure they are gone from the field of view long before the exposure is over. Astronomers, however, have instrumental arrangements worked by means of a clock so contrived as to turn a telescope that it shall always follow the moving object, and the astronomical camera is fixed to one of these arrangements. The clock is set going, the exposure started, and the plate follows the object, but, unfortunately, not with perfect accuracy. By means of a supplementary camera, or telescope, the observer can watch how the clock performs its duty, and by means of adjustments under manual control can render the following-motion perfectly uniform—that is to say, if he remain on the *qui vive*. When the exposure amounts to, say, three hours, our readers may imagine the state of exhaustion an observer, with his eye

fixed upon one star the whole of the time, must arrive at before the conclusion of his vigil.

The actual form the camera assumes is as varied as the optical means employed. This latter may be the ordinary astronomical telescope refractor, or a reflector, either with or without a magnifying lens at the focus; or, again, it may be an objective specially constructed or adapted for the purpose. Of the latter classes, by far the most celebrated instrument is the objective of Messrs. Paul and Prosper Henry, now in use at the Paris Observatory, where it was placed in May the year before last. The photographic lens is 33 centimetres in diameter, and 3.43 metres focus (*i.e.* about $\frac{1}{10}$), and it is accompanied with a finder of about the same focus, but smaller in diameter. This photographic lens has a chemical focus which is accurately determined, so often as once a month, by a simple process. The focus is first roughly found by means of a piece of blue glass, and then at measured small intervals on each side of this focus a series of images of a star is taken upon a small plate; the sharpest image shows the true focus, and the adjustment is made in accordance.

That such expensive optical appliances are, however, not actual necessities is proved by the work done by the Liverpool Astronomical Society, work, unfortunately, which has had to be given up, for a time, at any rate, through want of funds. They employed, and with conspicuous success, a camera and lens made by Mr. Howard Grubb, the lens being apparently a photographic portrait objective, as its focus is under sixteen inches and its diameter four and a half. This was mounted in the usual manner with a driving clock.

With both the Paris and the Liverpool instruments gelatine plates were, as we need scarcely say, employed. The Rev. Mr. Espin has given to the public his mode of working. He states that pyro development was tried, but soon given up in favour of ferrous oxalate; and to ensure the best action the solutions were made fresh for each evening. All the Liverpool negatives were taken on commercial plates, Wratten & Wainwright's "drop-shutter" plates being the brand employed.

At Paris the plates would appear to be made upon the establishment, as, in Admiral Monech's report in the *Annuaire* of the Bureau des Longitudes, reference is made to plates of various kinds, the most rapid being such as would not keep more than a day. These latter plates were, on that account, not employed in the actual work of mapping. The Admiral further states that there is a limit to the sensitiveness of the plates it is desirable to use, for, whether owing to light reflected from the lamps of Paris into the atmosphere, or from the rays of the moon, there is a certain amount of glare or diffused light which has an action upon the plates, and fogs them. *A priori*, it might have been thought the duration of exposure would have been diminished *pari passu*, and so obviated fog.

It will, no doubt, at once occur to our readers that some plan would be necessary to prevent small specks of dust or imperfections of the film being mistaken for stars, and this possibility has been felt and provided against, in a manner as successful as it is ingenious. The plan involves great labour, but the end is worth the means. Upon each plate the map of the stars is photographed three times over, by means of a delicate mechanical adjustment the plate being slightly shifted between each exposure in such a way that the image of every star is repeated so as to form a minute triangle. This triangle is so small that to the naked eye it appears as a single spot; but under a magnifying glass the three points are each seen, and thus error is rendered impossible. With regard to the

exposures required, there is a striking discrepancy between the Liverpool and the Paris experiences which is scarcely accounted for by the difference in the lenses. Thus, for stars of the fifth and sixth magnitudes, Mr. Espin gives one second and thirty respectively; while Admiral Mouchez requires only one-fiftieth and one-twentieth of a second for the same magnitudes.

We have, however, now treated with as much fulness as our space will allow the leading points of this most interesting subject, and we now leave it, hoping to return to it at no distant period with the object of showing how a little astronomical photography can be undertaken with no further apparatus than an ordinary portrait camera and lens.

COLOUR SENSITISING OR COLOURED SCREENS?

WE spoke last week of the possibility of discrepant results being obtained by different experimentalists with orthochromatic plates owing to slight variations in their methods of preparing or dipping the plates; and it is now our intention to say a few words upon some of the widely divergent opinions that have been expressed with regard to the value not only of home-made "colour-sensitive" plates, but also of the recognised brands of commercial manufacture.

We fully recognise that most probably these latter may, and no doubt do, vary materially from time to time, and that in consequence more or less divergent results may be secured by different operators; but it is scarcely just on this account to deny, as has been distinctly the case, the entire principle. Some time ago it was publicly stated by one gentleman that he believed orthochromatic photography to be a delusion; nevertheless, many others have convinced themselves, and what is more to the point, have supported their convictions in the most eloquent manner by actual results of a surprising character. Others, again, assert that the correct rendering of colour gradation is only a matter of exposure, and that ordinary plates, if properly treated, with or without the intervention of a coloured screen, will produce all the effects that are to be obtained by means of the so-called orthochromatic films.

We confess that we were at one time much of this opinion, but we cannot help acknowledging that experience has entirely changed our views; that, in fact, after commencing to experiment with the purpose of demonstrating this aspect of the question we were forced to recant, and now stand, in spite of the diversity of opinion and the numerous accounts of failures we hear, firm believers in the principle and its value. Perhaps the succeeding remarks on one or two points that have struck us may help in some cases to elucidate the mysteries of non-success.

The causes of failure, or supposed failure, may perhaps be generally classed under two heads; in the case of those who have attempted to prepare their own plates, the idea that all that is necessary is to *colour* the film, and with those who have failed with commercial plates, the expectation of too much has led to a want of recognition of what actually is gained. Without going into the theory of the process, it may be remarked that from what has recently been published it appears absolutely necessary that a silver compound must be formed with the colour sensitiser, while there is abundant testimony that mere colouring or staining the film is useless or worse. With regard to failures with commercial plates, it is possible, perhaps, that the makers are partly to blame in leading the public to expect too much; for when it is clearly stated that the plates may be used without the yellow screen the tyro naturally jumps to

the conclusion that the highest results are thus obtainable, and, finding such not to be the case, forthwith condemns the whole process. On the other hand, we do not agree with Mr. W. H. Hyslop, a successful amateur worker of orthochromatic plates, when he says that there are no plates in the market that will give an orthochromatic effect without a coloured screen. Our own experience is to the contrary effect, though we are not prepared to deny that there are plates in the market which absolutely require the screen, as the following experiments will show.

Two different brands of orthochromatic plates were pitted one against the other under precisely similar circumstances, together with another sample of ordinary (or shall we say, hetero-chromatic?) make, as a comparison. The colour chart employed comprised a variety of designs as well as colours, but the two combinations we shall have most pointedly to refer to consisted, one, of a bright but light yellow cross in a circle, the ground between the arms being filled in in alternate quarters in vermilion and bright, tolerably dark blue; the other consisted of a circle of the same yellow surrounded by a series of concentric lines in blue, separated by white.

The exposure required by the ordinary plate in order to give what we are accustomed to consider a "good" photographic result, was found to be five seconds. Exposures were then made upon each of the three samples of plates of five, ten, fifteen, and thirty seconds respectively, and each plate was developed separately in a solution of the same composition until the image appeared faintly at the back of the plate, where that was possible. The two samples of colour-sensitive plates, which we will call A and B, though they gave a perfect image with the shortest exposure, were evidently underdone, and it was not until A had had ten seconds and B fifteen that they could be considered fairly exposed. The ordinary plate with five, ten, and fifteen, gave negatives that would have been selected for quality in preference to all the rest; with thirty seconds it was overdone. As the result, so far as colour rendering is concerned, did not vary in the respective sets of plates in the slightest with the exposure, the only difference being in density and contrast, the sets will be compared as single plates presently.

Next we employed a coloured screen of orange-coloured silver stained glass; the colour was of considerable depth, but it was the lightest we had at hand. The plates A and B were then exposed for thirty seconds, one minute, and five minutes; the ordinary plate for one, five, and ten minutes. One minute sufficed for A and B, while five minutes gave a softer result without any general change in the character of the image; five minutes proved scarcely sufficient for the ordinary plate, but ten was all right.

Prints from these negatives are now before us, and we will as briefly as possible describe the different results. Taking the ordinary plate first, we have the yellow cross rendered midway between the blue and red, the latter being practically black and the former not much removed from white. The blue-margined circle is naturally rendered with a moderately dark body and lighter edge. The B orthochromatic plate gives precisely the same effects, differing not in the slightest degree in consequence of its colour treatment when used without the screen. The A plate has, however, shown a marked modification, though it does not go so far as the reversal of the renderings of blue and yellow. In the ordinary plate the yellow cross stands out perfectly distinct upon a parti-coloured ground, but in this its outline is lost, the yellow and the blue being rendered so nearly

alike that it requires close examination even of the negative to find the outline. In the other diagram, too, the two colours are reproduced with such nearly equal force that it is impossible to separate them.

Turning to the second series of exposures through the screen, the ordinary plate exhibits not the slightest variation from what we have already described in connection with the first sets. We may dismiss it at once. B and C, however, show an entirely different aspect. The first diagram represents a very light cross on an evenly dark—nearly black—ground, the blue and the red being perfectly indistinguishable even in the negative. The yellow circle, with its border of blue, which without the screen is shown as an evenly-coloured, rather dark ball, now appears as a very light disc, with a well-defined and much darker margin.

Another pattern in the chart consists of a series of alternate blue and green stripes, which are rendered without the screen upon both ordinary and orthochromatic plates, especially the former—with the blue much the darker; but in the orthochromatic plates, with the assistance of the screen, this result is reversed, showing that it is not only the blues and yellows that are affected, the green being reproduced in a much lighter shade with the screen.

These experiments, and numerous others of a similar nature, have convinced us, in the first place, that orthochromatic plates may possess a power of their own even in white light, but that it is greatly intensified by the use of the coloured screen; secondly, that plates may possess orthochromatic properties when aided by the screen, though they are totally devoid of them otherwise; and, thirdly, that the screen alone is of no use whatever with plates that do not possess some tendency in the direction of colour sensitiveness. We may qualify this by stating our belief that *some* plates may possess such tendency without having been specially prepared for colour purposes, though it will be in a greatly inferior degree. We are led to this view from an observation made in experimenting with the screen on a particular batch of plates, one of which, excessively under exposed, showed distinctly in the negative the well-marked cross on a clear, transparent ground. But even in this case, with a longer exposure, that sign of orthochromatism disappeared. These plates were of our own make, and contained chloride, which seems to lend itself to colour-sensitising purposes better than bromide.

We shall resume the subject next week, when we hope to have something to say further with regard to the theoretical side of the screen question.

Our readers everywhere, but more especially those in and around London, will learn with feelings akin to sorrow that a gentleman long and favourably known to them, either by name or personally—we allude to Mr. W. K. Burton—is about to leave this country for a protracted term of years. Mr. Burton has accepted an important position offered to him by the Japanese Government, and on the first of next month starts for his future home. He is to occupy the newly created "chair" of Sanitary Engineer in the Imperial Institute of Japan; and we are certain that we speak the sentiments of every one in wishing Professor Burton a prosperous career. He has promised that our readers will hear from him occasionally. Before leaving he will be entertained to dinner by a few friends. Those desirous of joining the party will find particulars in our issue of next week, as the details have not been settled at the time of our going to press.

TUESDAY last will long be remembered by residents in the Metropolis as a day of fog of a unique and exceptional character. Meteorologists

tells us that the cause of the combined snow and fog was that London was a kind of meeting-place of two streams of barometrical depression, the one coming from the east, the other from the west. But, be the cause what it may, the darkness at midday on Tuesday somewhat exceeded that experienced at midnight; it certainly was so around the Covent-garden district. It was not so much a genuine fog, as the term is understood, as a modified fog enhanced by a black pall overhead, which effectually debarred access of light from above. Professional photographers in London are, during winter and early spring, entitled to the commiseration of their brethren in the provinces. But even fog will not be without its uses if it prove an incentive to the more general introduction of the electric or magnesium light.

The spontaneous discolouration of paper, always a subject of interest to the photographer, attracts at the present time more than usual attention, bound up as it is with questions of permanency. Many years ago it was shown that the so-called "fading" (a curiously contradictory expression) of certain carbon prints was simply the discolouration of the paper itself upon which they were printed, and every now and then the same point crops up when "permanency" questions are under discussion. It has always been considered that the presence of wood pulp in the composition of a paper is a material factor in the production of this effect, and experts could, no doubt, when thus forewarned, form a fairly accurate estimate as to the quality of any particular sample of paper in this regard. Hitherto, a ready test, simple in application, has not been described; but in a well-known German technical periodical Herr C. Wurster gives an account of a simple method of testing paper for the presence of such deleterious matter. He states that the yellow and brown colour acquired by some papers is due to the action of active oxygen on the resin used in sizing the paper, or, in some cases, upon the woody matter present in the paper; but that the presence, or even the percentage amount of woody matter can be determined by means of a test paper made of a certain chemical. When the moistened paper is pressed between paper containing wood, it acquires a deep red colour; ordinary sized paper merely turns it a delicate rose colour. Our readers, in the course of the eosine discussions, have been rendered familiar with the more than sesquipedalian names of complicated carbon compounds, and this new test paper has a name of equal lengthiness; it is made by steeping in a solution of dimethylparaphenylenediamine.

We note that in the publishers' announcements for spring, photography promises to be well represented. Messrs. Sampson Low, Marston, & Co., announce the *Pioneers of the Alps*, to be illustrated by photogravure portraits from the original plates taken by Captain Abney. Also *Life and Nature Studies* by a gentleman whose paper read before a metropolitan photographic society, given in our pages some little time ago, was read with such deep and absorbing interest by artistic photographers—Mr. Hume Nisbet. Then, again, Mr. H. K. Lewis will immediately issue *Photography of Bacteria*, illustrated with eighty-six photographs reproduced in autotype, by Dr. Edgar M. Crookshank.

Appropos of astronomical photography, we may draw attention to a note presented on the twenty-eighth ultimo to the Paris Academy of Sciences by M. Bouquet de la Grye, which will give some faint idea of the enormous amount of labour entailed after obtaining a desired set of negatives. M. de la Grye's remarks are upon the "Transit of Venus" results of 1882. Altogether one thousand and nineteen plates were dealt with, and the calculations involved were so lengthy as to cover no less than thirty-two thousand sheets of paper!

It is known that gas engineers are treading hard upon the heels of electricians in devising more powerful and cheaper gas lights (there is no doubt as to which is the more convenient process for photographers). Already there is to be seen in practical application in London a method of producing a powerful light by means of the heat

of a gas flame rendering incandescent an infusible body, and other similar systems are elsewhere in use; but at present the great drawback to this method is the cost of the gas. Water gas can be produced much more cheaply, but at present it is not, as a rule, "laid on." But an experiment is now in progress in Brussels which may have an important influence upon the price of gas. M. Wybauw, the gas engineer to the Municipality of that city, has advised the price of gas for day consumption, i.e., for manufacturing purposes, to be reduced fifty per cent., and the plan has been in action long enough for him to be able to write that "The success of the experiment has been complete." That with gas at a shilling or eighteenpence per thousand feet there would soon be a practicable light for the studio, there can be little doubt.

THE LEGITIMACY OF DOUBLE PRINTING.

AFTER a careful perusal of the interesting lecture delivered by Mr. Norman Macbeth, R.S.A., before the members of the Photographic Club—and a careful perusal it richly deserves by all who aim at artistic work—one cannot but feel there is a bias and not in favour of photography in the assumption that photography is out of place if it attempts idealism. According to the lecturer photography has a plain matter-of-fact course to run, and it must not deviate from that track under any circumstances. This is scarcely fair to photographers, some of whom have succeeded in imparting by their own skill and intuitive perception of the beautiful, highly artistic and idealistic qualities to their pictures. Did not Rejlander produce anything that might fairly claim to be idealistic? Has not H. P. Robinson, Adam Diston, and others combined negatives so that the resulting print told its tale in a manner not to be gainsaid? And to my thinking a great deal better than scores of pictures we see hung at our picture exhibitions, and which claim to be exemplifications of fine art. Undoubtedly artistic improvement is the quality photographers will have to cultivate, and it is hard lines for them to be told at the outset they are seeking after a chimera, and the process they use is incapable of producing more than mechanical work at its best. Why the lecturer should set his face against a photographic picture being made of more than one negative I am at a loss to understand, unless he is under the impression it cannot be done without a great deal of hand work to hide the junction of the different negatives. This, at any rate is not the case, and a clever manipulator will be able to effect it without the slightest indication of such joins. That figures can be introduced into landscapes without infringing the least canon of art has been done repeatedly, and I do not think better instances of this can be pointed out than the small figure subjects with natural backgrounds Mr. T. Edge introduced many years ago. There was no touching up to hide the joins, and no inlaid appearance when they were done. They were perfectly natural, perfectly artistic, and perfect pictures in every sense of the word, and could the lecturer have seen some of the best examples I am inclined to think he would withdraw his opinion as to the inartistic effect of printing from several negatives.

Again, with respect to printing in skies to landscapes where otherwise there would be a blank space or a graduated tint utterly inappropriate for some subjects. Graduated tints only suggest a perfectly free, cloudless sky, and photographers aim at something more than only representing nature in its softest moods. Fancy a picture of a coast scene on a rough day, who would think a calm and cloudless sky could by any means accompany such a scene? It would be altogether out of place and an utter absurdity. Printing in clouds from a separate negative is, to my thinking, *when properly done*, a very artistic improvement, and I fail to see why any exception should be taken to it. Skies utterly inappropriate may be added, and frequently are, but that is no argument against their use in a *proper* manner; if they convey a truthful impression painters can do no more. It is said that because the landscape is affected by the shadows of the clouds that pass over it, by putting clouds in that were non-existent at the time is contrary to truth. Why this argument should be applied *only* to photographers is difficult to say. I should like to know how often a painter puts into his picture the sky that existed at the time he painted the landscape. The fact is that except in certain cases the shadows of the clouds are a very unimportant factor in the matter; in the first place

the cloud must be very dense, and, secondly, it must pass between the sun and the landscape being photographed. In a general way the sun is either at the side or behind the photographer, and the shadows cast from the clouds are barely perceptible. If they do fall on the field of view the slight flattening effect produced is absorbed by local colour or configuration of the ground, and becomes quite inappreciable in the photograph. For clouds to visibly affect the photographic landscape they must be heavy, and the sun must be behind them and in front of the camera, and a wide open view must be the kind taken. Then with a very rapid exposure cloud shadows will be noticeable. Now, except for certain effects, such a position with the sun in front of the camera is rarely ever chosen, as it is the very worst kind of lighting for general subjects—opaque objects, such as trees, houses, &c., are rendered with little or no detail and in a manner silhouette against the sky, and the least mistiness in the atmosphere is greatly exaggerated. The cast shadows of clouds are so very indefinite and fleeting that few artists ever paint the same clouds that existed at the time they painted the landscape or the same shadow they produced—except, as I have already said, in special cases—and I am convinced that no artist or photographer could by any possible means decide if the clouds shown in the photographed picture existed at the time and were simultaneously taken with the landscape, or if they were entirely foreign to the subject. Of course this is presuming such clouds were artistically and skilfully managed. I have seen photographic pictures with skies taken simultaneously with the subject that had the appearance of being afterwards added, much more than when they were really so. It *very rarely* happens that the existing clouds compose anything like as well as clouds afterwards added, and the fact of the special suitability of the sky at once hints at double printing. Painters themselves generally suit the form of their clouds to their subjects, or ought to do so, and would probably be astonished if they were charged with not being true to nature because they did so. The fact is a certain amount of license is not only permissible but necessary in picture making, whether the means used are pigments or light itself. Any one taking advantage of the means at their disposal (by two or more negatives in the case of the photographer), so long as the results harmonise, are quite, in my opinion, within the legitimate scope of the art they employ.

EDWARD DUNMORE.

MECHANICAL OPTICAL LANTERNS.

LECTURERS are, no doubt, at times in great difficulty to find a suitable operator to work their optical lanterns and dissolving apparatus, and anything that can be made known in furtherance of the simplification of manipulation, or in the way of mechanical or automatic means of projecting pictures on a screen, must be of value to lanternists. If an audience is so fascinated by the subject matter and delivery of the lecture, and pictures are only required to demonstrate ideas or certain points in a lecture, a single optical lantern meets the requirement of the case, and with a little scheming a novice can be utilised to satisfactorily "second" the lecturer by passing in and out of the lantern the pictures to be produced; but, as a rule, if the entertainment is a pay one, something more for the money than ordinary photographs or pictures is looked for, and dissolving or mechanical effects have to be introduced to give variety.

Considerable ingenuity has been displayed in designing and constructing single and dissolving view lanterns and carriers to this end; and as some of them may have passed out of memory or not been heard of, I will endeavour to briefly describe those I consider to have merit and from which ideas may be borrowed or improved upon in constructing apparatus to meet the individual requirements of the lecturer.

In the front rank I think I must place a lantern which provides for the mechanical changing of the pictures by means of a rotating cube, holding in succession a series of photographs, fastened together by tape and passing out of one box into another through an open stage. The cube being just the size of the glass on which the view is photographed or painted, and hollow, as it is turned it moves away the picture last shown and brings the next one down, the tapes allowing the slides after use to fall flat into the empty box which is to receive them.

As I write this a plan suggests itself to me that I think could be utilised for optical lanterns, requiring but little attention while in use. It consists of an arrangement of wire holders for the slides, fastened to endless bands and turned by handles as in a revolving stereoscope.

In this way, if the condenser of the lantern is rather larger and of longer focus than usual, to counteract for the extra distance the photographs or pictures are away from it, a number can be shown in succession by simply turning the handle, and if holders for twenty-five are arranged for in height a double width would give fifty, and it would only be necessary to shift the box sideways after each twenty-five had been shown. Should more than fifty photographs be required to illustrate the lecture another box could be inserted, or it would be easy to arrange for sixty by making two rollers of thirty each. Either of the above plans have the merit of not requiring any more attention after once the light is started than the simple turning of a handle, and should the lecturer desire to be independent of any extraneous assistance whatever he could, without any considerable difficulty, get a simple pedal arrangement attached to the axis of the cube, or the handle of endless band, so that the foot, acting on a lever, the revolution could be performed.

Most oil lamps after being carefully adjusted require little attention during an hour and a half entertainment, and with the limelight, if the lecturer set all the taps carefully to get the best light and fixed one of the four-way Universal dissolving taps (or to express it more correctly, an on-and-off cock with bye-passes) between the jet and the bottle or ball and hydrogen supply, the light could be raised to its proper and originally fixed brilliancy, by simply moving the lever of the dissolver. The limes, by means of clockwork, can be made to turn, and it must be a dunce indeed that with lime forceps handy could not replace a cracked or broken lime with a new one, after lowering the lights to the minimum to keep it alight, by moving the lever of the four-way dissolver.

It is a matter of surprise to me that these four-way dissolvers are not more used than they are for this purpose, as to my mind it is a great advantage after once getting the best light (and having everything ready) to be able to go away to the lecture table or elsewhere about the room, and know that on returning or giving a signal the impromptu assistant, with only five minutes previous tuition, can start operations by moving the lever. The gas bottle with automatic gas regulator attached furnishes a perfectly uniform flow of pressure after once being set.

For showing mechanical and ordinary slides as they may occur in the arrangement of the illustrations for the lecture, the lantern with double stage known as the "Metamorphoser" is an excellently designed instrument, and in its improved form capable of serving many purposes of a public lecturer if the operator has a little rehearsal and used ordinary common intelligence. The new Eclipse carrier designed and patented by Mr. R. Beard and sold by the leading opticians, makes the perfect centring of each slide certain and its change automatic, the only thing the operator has to do is to see that the slides are put in the carrier the right way up. If a bold label is put on the corner of each, showing the right side and proper way up, it is not likely a mistake can occur with a succession of photographs or pictures $3\frac{1}{2}$ inches high (the length may be $3\frac{1}{4}$, $3\frac{1}{2}$, or $3\frac{3}{4}$, and will still be centred).^{*} When a mechanical slide has to be shown the brass lever that shifts the stages is depressed and moves up into position the second stage in which the mechanical slide is placed.

The mechanical dissolving view apparatus I will describe in next article.

G. R. BAKER.

"ARTIST AND PHOTOGRAPHER."

How often I see this title (or, rather, these titles) in advertisements and on the back of mounts. Yet what a libel this is on photography! As the two words are separated by the conjunction it is left to be understood that *photography* is not *art*, but only that a photographer may also be an artist. If these advertisers mean "painter" by "artist," why don't they say so?

This introduces a question worthy of a few moments' consideration:—"Is Photography an Art?" I am perfectly aware that my readers are getting their "chestnut-bells" ready. I am ready to admit that the conundrum propounded above is a veritable worm-caten "chestnut." But has the question ever been satisfactorily answered? I give below a few reasons why I answer "Yes" to the afore-mentioned conundrum.

First, its latitude. Any science or portion of a science becoming an art when one of its votaries can so weld it, by exercising his own judgment, into different form, that he can produce a better and more pleasing work than another who works, not by individual effort, but by rule.

^{*} The operator has simply to insert the slide, push the runner right home, withdraw the runner and with it the slide last used, which he puts into a vacant box, and then repeats operation by inserting another slide. The act of drawing out the brass runner causes spring arms to automatically push the new photograph into position and consequently into focus.

Secondly, its indefinite formulæ. It must be an art when the successful working of much of its process is left *entirely* to the judgment of the worker.

Thirdly, the dictionary definition. The meaning of "art" is generally given as "skill; cunning; rules under the influence of practical skill." This last follows photography line for line. A. G. FIELD.

MR. MACBETH ON LEGITIMATE PHOTOGRAPHY.

It would be difficult, if indeed possible, to overestimate the value of Mr. Macbeth's utterances on the art side of photography; we can never have too much of such teaching. But I cannot quite follow Mr. Macbeth in his *dicta* as to what is legitimate and what is illegitimate in the art. Mr. Macbeth expresses himself with such admirable clearness that I, of course, understand precisely what he means, and while I sympathise fully with his views, I cannot fully agree with his arguments nor his conclusions.

Mr. Macbeth clearly argues that we are bound to confine our attention and our operations to what is purely and solely photographic action, the work of "simple reflection" as he puts it. I am not willing for a moment to deny that what is not light action is not photography, that would be a flat contradiction of terms on my part. But why should a photographer be confined to photography? Are we bound by any law to confine ourselves to the effects of "simple reflection?" In that case we must never trim our prints, nor mount nor frame them. Yet trimming, mounting, and framing, are important points in the production of artistic work. The painter draws as well as paints, yet I never heard painting called a bastard art. The sculptor is to a certain extent also a plasterer, but a statue is not an illegitimate production in common parlance. Why then should not a photographer be also a drawer, or a combiner, or an etcher? I cannot see where the difference comes in.

Mr. Macbeth sees no harm in getting together, all at one time and place, groups of figures with appropriate surroundings, but he will not hear of portions of the whole being photographed separately, and then combined by any means whatever. I grant the difficulty and the usual failure, but I ask, Where the objection? And why is a painter to be allowed to do what is forbidden to the photographer? Are we to insist that a historical subject is to be painted actually in presence of all the figures or models, and if not, why not? The one is as impossible to the painter as the other is to the photographer.

Mr. Macbeth objects to the double printing of clouds, and says it is more legitimate to wait till a suitable cloud comes on the scene than to select a suitable cloud from a box and print it in. Putting aside the question of *getting* the suitable cloud along with the view, and overlooking the somewhat nice point of *photographing* it along with the view, even with one of the old sky shades, I still cannot help thinking that the double printing operation is every bit as artistic as the other, and it is pretty certain to be more successful. Mr. Macbeth carries his aversion to double printing to a great height when he recommends as an alternative the ancient system of vignetting, or graduating the sky on the print. Nor can I see any vital difference between this vignetting and the vignetting of one negative into another, as in combination printing, which Mr. Macbeth deprecates. They are equally light action and equally vignetting, only the combination printing is *faute de mieux*, while the sky graduating is *faute de pis*.

And with regard to retouching. What good reason can be stated why we should be bound to leave portrait negatives with all their facial colour defects not only reproduced but exaggerated? Retouching is certainly not pure photography, but the virtues of charity, honesty, courage, are not pure photography either, and yet are not forbidden to the photographer. I remonstrate against the idea that photographers are to be forbidden all else besides photography. I thoroughly agree with Mr. Macbeth that retouching and combination printing are frequently badly executed; but that fact does not appear to me to condemn the operations, but only the operator in each particular case.

It is true that Mr. Macbeth does not pretend to urge any arguments in favour of his proposition, he merely states that he objects to certain things as being non-photographic. For my part I can see no reason for his proposition, and in certain phases Mr. Macbeth's reasoning seems to contradict itself, as I have already pointed out.

Is there a fear in some quarters that photography is encroaching, or apt to encroach, on the sacred precincts of painting? That is the only possible objection I can discover to combination printing and "modelling," and it is an objection entirely one sided and worthless from any point of view except one. I yield to no man in my veneration for a really good painter, but I have no great respect for a poor

one, and I consider a really good photographer a more admirable person than a second-rate painter. And I have a suspicion that the public is pretty much of my opinion in these latter days, when photographic portraits are being produced and carried (by the methods Mr. Macbeth objects to) to a pitch of beauty and excellence not until lately dreamed of. Photography will never probably affect the higher grades of painters, but it has seriously affected and will still more affect the less talented painters, unless, of course, photographers follow Mr. Macbeth's advice, and confine their attention to the mechanics and chemistry and the almost impossible combinations of figures and furniture which Mr. Macbeth seems to lay down as the fitting *ultima thule* of our aspirations.

Be it noted that I say nothing here of exhibitions. A photographic exhibition should be an exhibition of photographs, not of drawings, nor etchings, nor paintings.

Considering Mr. Macbeth's position, his experience, and his age, I deliberated carefully before thus venturing to dissent so strongly from his theories. But dissent I do most emphatically, come what may. If photography could be brought to such a state that we could by pure photography produce the effects we aim at, I should say, stick to pure photography. But at present it cannot be done, so I say, use what aids you can, no man has any right to forbid to you aids permitted to others. Photography, as well as painting, must be done so as to please.

ANDREW PRINGLE.

P.S.—I hope no one will suppose I am here advocating wholesale "retouching." I never tried to retouch myself, nor do I ever get my negatives retouched for my own use. "Modelling" at the best is a makeshift; but that does not condemn its use *in toto*. Better "model" than send out horrors.

A. I.

TIHERMO PHOTOGRAPHY.

I AM pleased to be able to give you the particulars of my experiments in the production of thermographic impressions on the solarised phosphorescent tablet, which prove the correctness of my first conclusions. The description which I append was communicated to the Franklin Institute at the last meeting, and the experiments have been repeated in the presence of Dr. Wahl, Secretary of the Institute, who can vouch for the care with which they were conducted.

I did not claim any discovery or advance in the production of negatives of the ordinary camera impressions on the phosphorescent tablet, but informed the members of the Institute that that was an old and practically useless, though interesting, method. I did believe I was the first to make any sort of a camera picture of an object by the action of the heat rays, never having heard of Captain Abney's lecture experiment which you mention. Even now I do not know what his method is, or whether he obtained anything more than a mere fugitive impression.

Referring to my reproduction of the limelight spectrum impression, it may be of interest to know that the spectrum apparatus was fitted with glass lenses, and the plate holder was about five feet away from the incandescent lime. The tablet was *strongly* solarised before exposure to the spectrum. With rock salt lenses, the heat spectrum would have appeared both longer and relatively stronger.

In regard to the "temporary exaltation and corresponding partial exhaustion of phosphorescence" which I observed, I find that Dr. Draper recognised this property of heat, he having stated, in 1851, that heat does not *destroy* phosphorescence, but *sets it free*. (Draper's *Scientific Memoirs*, pages 155-161.) Heat temporarily increases the intensity of phosphorescence, because it acts to liberate the phosphorescent energy.

A word, also, in regard to the indistinctness of "phosphorescent photographs." Sharp negatives cannot be obtained by contact, because the coating of phosphorescent powder must be made so thick that contact with the surface is far from being contact with the lower part of the layer, which also becomes luminous. But the phosphorescence itself does not spread so much as has been supposed. On suitably prepared tablets, camera impressions can be obtained that appear quite sharp, and reproduce in the camera much sharper than by "contact."

FRED. E. IVES.

HEAT PHOTOGRAPHY.*

At the November meeting of this Institute, I described certain experiments in photographing by the aid of the phosphorescent tablet, and announced the discovery of a means of photographing obscure objects by

* This term may be objected to, but is employed because the result of the method described is a fixed photograph of a fugitive thermographic impression.—F. E. I.

the action of heat radiations. Since then, I have made several camera photographs of metallic objects by the action of obscure heat rays, which I placed the objects in a position to reflect. With a source of heat produced with the consumption of coal gas, at the rate of only three feet per hour, I obtained strong heat photographs of small metallic objects, with camera exposures of only ten seconds. But, although a moderate amount of heat was sufficient to give such striking results, it proved to be necessary, under ordinary conditions, to employ heat of a certain quality or intensity, which can be obtained only when the source of heat is also a source of light. My source of heat was the incandescent lime of the oxyhydrogen light, placed in a dark box, one side of which was of black glass; the black glass transmits about thirty per cent. of the intense heat rays, but no rays capable of producing phosphorescence or of affecting bromide of silver.

The object was focussed by the light rays, allowance being made for difference of refrangibility of the heat rays; the light was then extinguished by the black glass, and a solarised phosphorescent tablet exposed in the camera. As I explained in my preliminary communication, this exposure produces a dark impression instead of the luminous impression that would be produced by violet light, and the photograph of this impression, made by contact printing on a photographic sensitive plate, is, therefore, a positive, instead of a negative.

I attempted to substitute a hot iron for the incandescent lime as a source of heat, and even to photograph the hot iron itself, but without success. This might seem to indicate that the tablet is not sufficiently sensitive to the feeble heat rays radiated by objects not heated to incandescence; but a simple experiment demonstrates that such is not the case. Contact with the hand for a single second will produce the characteristic sudden exaltation and partial exhaustion of phosphorescence in a tablet that has been kept at a sufficiently low temperature after solarisation, and a simple calculation will show that enough heat is radiated from the hot iron to produce, in a little while, a strong impression in a camera some feet away. The knowledge of this and of the fact that rock salt lenses transmit, and metallic mirrors reflect, these feeble heat rays, led me to hope that I might photograph obscure objects without having to secure the special conditions that now appear to be necessary. My failure with the hot iron proved to be due to absorption of the heat rays by aqueous vapour in the air. Professor Tyndal found by experiment that the aqueous vapour in the air of his laboratory absorbed seventy times as much heat as the air itself. My experiments were conducted in very damp weather, and nearly all of the heat radiated by the hot iron was evidently exhausted in warming the air, and was carried away in air currents. Although I did not accomplish what I hoped to in this direction, these experiments have made it evident that in a perfectly dry atmosphere it would be possible to obtain photographs of obscure objects by the action of heat rays of low intensity.

I have two illustrations of the method; one is a heat photograph of a German silver key check, the other a photograph of the impression produced on the solarised phosphorescent tablet by the limelight spectrum. The key check photograph is quite small, but reasonably distinct. I believe it is the first heat photograph of an object that has ever been exhibited. The shadows of three pins are reproduced in the spectrum photograph; one was in the violet of the spectrum, another in the yellow, and the third at the lower limit of the visible spectrum. This photograph proves what I have already asserted—that in Balmain's paint phosphorescence is produced chiefly by the violet rays, and the dark heat rays below the visible spectrum act most powerfully to exhaust that phosphorescence. Exposures on the solar spectrum gave substantially the same result, but showed relatively more action by luminous heat, and distinct but very feeble action in a portion of the ultra violet spectrum—the latter action was utterly insignificant as compared with the action of the same rays on bromide of silver.

In my preliminary communication I stated my belief that certain results that one M. Charles Zenger recently claimed to have obtained by the aid of Balmain's phosphorescent paint could not have been obtained in the manner that he described. My later experiments confirm this belief, and I would not again refer to Zenger's communication had it not been widely published, attracting much attention. Balmain's paint is but feebly sensitive to invisible chemical rays, glass lenses are practically opaque to all heat rays radiated by bodies not heated above 200° Fahr., and even a moist atmosphere will not transmit the feeble heat rays to any considerable distance. If Zenger obtained a photograph of a midnight landscape in exactly the manner he described, it must have been by the action of light rays that would have produced a much stronger and better photograph by acting directly upon the photographic sensitive plate itself.

One other statement of M. Zenger's calls for correction by me.

He asserts that collodion-bromide emulsion plates stained with chlorophyl are sensitive to all parts of the solar spectrum "from ultra violet to ultra red." More than seven years ago I discovered and published the fact that such plates are so remarkably sensitive to all colours as to be capable, with the aid of a weak yellow light filter, of producing correct colour tone photographs of all coloured objects; but it is not true that the sensitiveness extends to the ultra red rays: it stops abruptly at the Fraunhofer line α in the red, as shown by spectrum photographs that have been made on such plates.

HOW TO PRODUCE A NEGATIVE.

[A Communication to the Dorset Amateur Photographic Association.]

THOUGH a very elementary subject, it will not, I trust, be considered an inappropriate one for the first practical demonstration before a newly-formed amateur photographic society, particularly since one of the objects of the said society is to assist beginners in the art.

I have more than once heard lately the regret expressed that the days of the old wet plate for field work have passed. It was said that with a wet plate you knew what you had before you left the spot; with a dry plate you might discover when a hundred miles away, and it was too late to rectify an error, that your dry plate was over or under exposed, or that there was some defect in it. The use of the dry plate has its drawbacks, but they are trifling compared with those associated with the use of the wet plate process. Many years ago I worked the collodion process in the field, and I still retain a vivid recollection of its troubles. The wet plate photographer was encumbered with a cartload of material and *impedimenta*, which had to be loaded and unloaded at each operation—he had to work in the stuffiest of tents, generally in the most uncomfortable of attitudes, and in a temperature inside which in summer was more than tropical. After going perhaps miles, he might discover that a leak in his bath cover, or an accident to his collodion bottle, or an oversight, had rendered his journey useless, and he had to return without attempting a picture; in many cases the accident was one which could not have been foreseen. I remember an unfortunate accident of this nature which befell me some twenty-five years ago in Ireland, near Killarney, where I was photographing. A room in the lodge of the house where I was staying was assigned me for photographic purposes: there I bestowed my goods and was happy. A convenient cupboard received my solutions and chemicals, and preserved them from curious and prying eyes and restless fingers; but not altogether, for one day, on going to the cupboard for the nitrate of silver solution for the bath, to my consternation the bottle was half empty. How could I replenish the bath nine miles from anywhere, and what should I do in the meantime? I feared the maid who looked after the room might have mistaken the clear solution for the “craythur” and drank it. My fears were allayed by hearing no allusion to the matter and seeing the girl in her usual health; but the bath had gone, and the maid alone had access to the room, and I could only suspect Bridget, who was accordingly sent for and questioned as to what had become of the liquid, and charged with having made away with it. This she indignantly denied. “Would she be ather a-going to the masher’s cupboard? It was not herself who would be doing such a thing, at all at all!”

There was no help for it—the bath was gone, and there was no photography to be done until fresh chemicals could be procured from England; and the worst of it was the criminal could not be traced, and might next empty the collodion bottle. Next day Bridget’s face began to assume a darker hue in streaks and patches, which became black and blacker. Bridget was terribly alarmed when she saw herself in the glass. She washed the stains with soap and water to no purpose; she scrubbed it with the scrubbing-brush, it still grew darker; pumice-stone and sand were tried—they removed the skin but the patches became more and more marked. Bridget was superstitious—the marks must be the marks of the “devil,” and she flew to the holy water which the priest had specially blessed for her; but even the holy water had no effect upon it. What would become of her, with the marks of the beast so evidently upon her? Bridget was then reminded of the cupboard and advised to confess all she knew about it, and the truth came out. She was dusting the room, and with a woman’s curiosity had gone to the cupboard to see what it contained; the clear liquid in the bottle tempted her, she would draw the cork, but as the cork was not easy to draw she applied more force—the cork yielded suddenly, so suddenly, that much of the contents was spilled on the floor. Shocked at what she had done, she hastily put back the bottle, and with her duster wiped up the clear liquid from the floor; the day was warm, she became hot with the exertion and with the fear of detection, and she wiped her face with the duster! It was a fortnight at least before Bridget was restored to her normal condition, and I think she never went to that cupboard again; she did not at least whilst I was there.

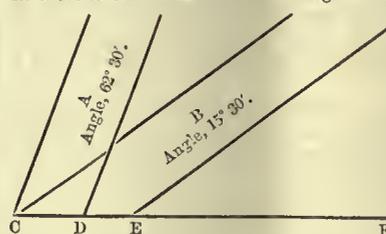
This little story, which is strictly true and unvarnished, has its moral. The moral is this:—There is something worse than not being sure whether you have a picture or not upon your plate, and that is, not being able to attempt a photograph at all.

I trust there is no doubt about the pictures upon these plates, or there will be no demonstration of development this evening. It is not a difficult matter in the summer, with a reliable plate and on a fine day, to secure twelve good views on twelve plates exposed consecutively, but at this time of the year the case is different; with the dull, uncertain light of these short days, which varies almost every ten minutes, one cannot be certain that the right exposure has been given. Let us try. The plate is one of Miall’s make; he is a good maker of a cheap and reliable plate. I have tried his plates by the side of some of the best in the market, and I have found them equal in every respect to any I have tried. I buy them by the gross, and I take care to stipulate that the whole batch shall be of one emulsion. After developing one or two trial plates I can determine for the whole what exposure or modification of treatment they require.

The first step towards taking the photograph is the *choice of the subject*. There are plenty of men who can take a picture which is technically perfect, but it requires the artistic taste and the artistic talent—which is innate and not acquired—to compose a picture. The photographer here is at a disadvantage as compared with the artist. The latter can leave out or modify any object which is not in harmony with the main subject, or which mars the repose or composition of the picture. The photographer must take all that comes into the field of his lens. Again, many pictures which look well to the eye will not compose well when seen on the screen, and in other respects much experience and dodging may be required to secure an artistic picture. Still, something may be learned from books, and much for the education of a latent artistic taste; but as the subject is a wide one to enter into here, I may perhaps be allowed to refer you to Mr. Robinson’s well-known books for many useful hints and much valuable information on artistic photography.

Having chosen your subject, the next thing is to *focus it*. If your subject is not a general one you would focus on the object of principal interest. For instance, you are taking a view of an old ruin. Remove the stops from your lens, and rack in or out the movable part of your camera until the principal details of the ruin in the centre of the picture are as sharp as you can make them; then stop down until the whole ruin is as sharp as you require it. If your subject is a general one, focus upon some object in the middle distance. A word may be said here about lenses, and especially about cheap single lenses, which it is a fashion to run down. Of course, if money is a matter of little consideration, and you want the best all-round lens, there is nothing to beat a Dallmeyer’s rapid rectilinear, but that first-class artistic work can be readily produced by cheap single lenses of the *modern type* is undoubted. I have here, and I hand round for examination, some photographs; they are not my own work, and I can accordingly speak more freely in their praise than I could otherwise have done. Two of them, you will observe, are figure subjects; another is an interior, with a figure sitting beneath an arcade of arches in an Italian painter’s studio; the fourth is the interior of an Italian kitchen—all of them subjects which are generally admitted to be most trying for a single lens. They were taken by an American lady with a cheap camera and a cheap single lens. What could be more artistic than the groups? And observe the softness of the interior of the Italian kitchen, with its shapely utensils lying about, and specially note the straightness of the perpendicular and horizontal lines; the lines, even that trying one of the corner of the room on the edge of the plate, are, so far as the eye can detect, perfectly rectilinear and perpendicular.

We have our subject focussed; what exposure shall be given? I have met amateurs and professionals whose views on this point are a little unsound. Sunlight, I have been told, is sunlight; and if you are taking a picture in brilliant sunlight at midday, whether in June or December, the exposure should be the same. You, gentlemen, know better than that, but you may not have considered the reason why this is not the case, why the sunlight of June is so much more actinic than the sunlight in December. I have here a diagram which will make it evident.



The meridian altitude of the sun on June 21 is $62^{\circ} 30'$, and on December 21 the altitude of the sun is $15^{\circ} 30'$. C D E F represents the surface of the ground, A represents the sunlight, which passes through a cardboard screen with a hole cut in it one foot square, and set at right angles to the source of light (the sun) on the 21st of June, midday—the light forms a rectangle on the ground of which C D represents the side. B represents the sunlight which passes through the same screen on December 21; it covers a rectangle of which C E is the side. C E, you will observe, is more than three times the length of C D, or, in other words, the same amount of sunlight which falls upon the surface of the earth on June 21 is distributed over three or four times the area on December 21, midday.*

How many seconds shall we give? Can you count *seconds* accurately? This is an important matter, for until you can do so it will not be possible for you to compare your exposures or the speed of your lenses with others. You will find a piece of string useful for learning to count seconds. Put a small bullet at the end, or your knife may be tied temporarily; tie a knot in the string about thirty-six inches from the weight, hold the string by the knot—you have now a pendulum, which, whether it swings slowly or fast, whether it swings through a greater or smaller arc, will always swing seconds. Your string and weight will be useful for another purpose, namely, to set your swing back perpendicular when photographing architectural subjects. Set your camera to take in the subject you desire, adjust the swing back by the weighted string held beside it, and focus.

We have chosen the view, focussed and exposed it, the next thing is the development. What *developer* shall we use? Ammonia and pyro, ferrous oxalate, carbonate of potash, soda, or some combination with

* The engraver has not given the angles accurately in the diagram, the length of the lines C D and C E do not therefore bear the proper relations to each other.

sulphite of soda, sulphurous acid, citric acid, or one of the more recent novelties? Until the amateur can produce good negatives with the old stock formula of pyro and ammonia he should not attempt any other; the plates which will not stand the ammonia developer, and the amateur who cannot use it, are neither of them of much account. When he has become tolerably expert with the ammonia, he might try experiments with other developers; but I think he will, in the end, go back to dry pyro and ammonia as being, on the whole, the best and most reliable for general use.

The solution of pyro preserved by the addition of sulphite of soda and similar chemicals is not altogether suited to the use of the amateur who only takes photographs occasionally. I have found much difficulty in obtaining it pure. Much of the commercial sulphite appears to be contaminated with foreign substances, which affect its action, and if pure, however carefully it is corked, it appears after a time to attract oxygen from the air, which converts it into the sulphate which retards the action of the developer, and it is open to question whether a similar change does not take place in it when it is kept for any length of time in solution, so that its properties become altered. The addition of sulphurous acid, as in Beach's formula, would, however, help to preserve it.

I formerly had much faith in citric acid added to the developer in the proportion of one-eighth to one-fourth of a grain to each grain of pyro, and for some purposes I still regard it as invaluable, but there is the same difficulty in obtaining it pure; it is commonly adulterated with more or less of tartaric acid, which ruins it for the purpose for which it would be useful if pure. I now obtain pure citric acid from a good chemist. When added to the developer in the proportion given above it makes a slow but admirable developer for transparencies on ordinary bromide plates. The deposit is slow, but exceedingly fine. A lantern slide developed by means of it will be clean and of good colour, without toning; try it for this and for transparencies for enlargements. For the latter purpose especially you will not be disappointed with it, though you may prefer the ferrous oxalate. You must remember, however, that with citric acid in the developer you will require much more ammonia.

But let us proceed with the development of the plate. We have in this wide-mouthed bottle little packets of pyrogallic acid folded up in tissue-paper, each packet twenty-four grains of dry pyro; in this form the pyro will keep almost indefinitely, though the wrappers may become discoloured. One of these packets contains sufficient pyro to develop four half-plates or a corresponding number of whole or quarter-plates. We have two half-plates to develop. We open a packet and divide the contents roughly with a pocket knife in half; the half we place in this eight-ounce measure, and add water up to the four-ounce division. We pour two ounces of the solution (which, you will remember, contains six grains of pyro, three to the ounce) into this developing glass, and having placed the plate in the tray, we pour the solution of pyro upon it thus. You will observe there is a thread beneath the plate—the ends of it are joined underneath the tray; by means of this the plate can be raised for examination very readily, and without soiling the fingers. Some persons soak the plate in water before developing. I have never been able to understand what advantage is gained by soaking the plate and filling the pores of the film with water, when it is as easy to fill them with the solution of pyro, which will assist development and help to give vigour to the negative. We will leave it in the solution of pyro for two minutes or so, meanwhile we will drop into the developing glass three or four drops from this stoppered bottle, which contains to each ounce of water—

Bromide of ammonium 30 grains.
Liquid ammonia ('880) ½ ounce.

We pour back the solution of pyro from the tray into the developing glass; this mixes the bromide and ammonia thoroughly with the pyro solution, which we now return again to the tray. We will now gently rock the tray, that the development may proceed evenly and regularly. The image is appearing, you will observe, in the high lights; they are now well marked. We will pour six or eight more drops from the stoppered bottle into the developing glass, and proceed as before. The development is complete. Notice the density of the high lights when viewed by transmitted light, and compare mentally when you see the picture in its finished state; it will be a guide in future development. We will now wash the plate under the tap, and place it in this tray, which contains a saturated solution of alum. It may remain there whilst we develop the second plate. That being done, we remove it from the alum, wash again, and place it in this solution of hypo, which has been used over and over again. I prefer a glass dipping bath similar to those used for the nitrate bath in the old collodion process, as the particles of silver salts fall to the bottom, and do not adhere to the films and cause spots, as they are apt to do when the plate is placed in the tray film upwards.

Observe, the plate is clearing, the free silver salts not acted on by light are being gradually dissolved out by the hypo. We must not, however, trust to this old hypo bath. We will take the plate out and immerse it for five minutes or so in this fresh solution of hypo, five ounces to the pint. The negative is now finished. It remains only to wash it well in several changes of water; if we had water laid on it would be well to dry it for a couple of hours under the running water. When thoroughly dry it will be varnished with enamel collodion or negative varnish; but the latter does not afford the same protection to the gelatino plate as it

does to the collodion negative. I will pass round these negatives and will send prints from them for the next circulation, you will then form your own opinion about them.
W. MILES BARNES.

ON SHUTTER EXPOSURES FOR OBJECTS IN MOTION.

In photographing a moving object, the resulting picture will always be more or less blurred. All that can be accomplished is to reduce the blur within such limits that the picture will appear sharp to persons viewing it. This limit, it is obvious, varies with the requirements of each picture. For smaller pictures this limit may not exceed four one-thousandths of an inch, when for larger pictures, to be viewed at a distance, one-hundredth of an inch or more may be admissible.

To reduce the blur, two methods are usually employed—either to increase the distance at which the photograph is taken, or to increase the speed of the shutter. The first method is limited by the size of the picture required, the second method by the sensitiveness of the plate used.

To obtain a desirable sharp picture, we have to select the proper distance at which to photograph the object, and adjust the proper time of exposure (speed of shutter).

The following formula will show the relation that exists between velocity of motion, distance, focal length of lens, time of exposure, and admissible blur:—

- If D = distance of object from optical centre of lens, in feet;
- M = velocity of object, in miles (statute), per hour;
- F = velocity of object, in feet, per second;
- f = equivalent focal length of lens, in inches;
- S = time of exposure, in seconds;
- l = limit of blur, in inches;

$$\text{Then, } D = \frac{44}{30} \cdot \frac{f}{l} \cdot MS + \frac{f}{12} = \frac{f}{l} \cdot FS + \frac{f}{12}.$$

In these equations, of which one is used when the velocity of the object is given in miles per hour, the other for velocity in feet per second, the term $\frac{f}{12}$ may be omitted, as in comparison with the distance D it will be found so small that it may be neglected, especially as the distance will nearly always be estimated.

From the above formula we can derive others, in case we desire to find the speed of shutter, the distance being given, or in case we desire to construct a table for exposure, in which the ratio between distance and focal length of lens is used as argument, namely:—

$$S = \frac{40}{30} \cdot \frac{Dl}{Mf} - \frac{1}{17.6} \frac{l}{M} = \frac{Dl}{Ff} - \frac{l}{12F}.$$

$$\frac{D}{f} = \frac{44}{30} \cdot \frac{MS}{l} + \frac{1}{12} = \frac{FS}{l} + \frac{1}{12}.$$

A table is here given of distances in feet at which an object in motion has to be photographed in order to obtain a sharp picture, the equivalent focus of the lens being six inches, the rapidity of shutter $\frac{1}{100}$ th of a second, and the blur being limited to $\frac{1}{1000}$ ths of an inch:—

Velocity, miles, per hour.	Distance in feet.	Velocity, miles, per hour.	Distance in feet.	Velocity, miles, per hour.	Distance in feet.
1	44	11	484	10	440
2	88	12	528	20	880
3	132	13	572	30	1320
4	176	14	616	40	1760
5	220	15	660	50	2200
6	264	16	704	60	2640
7	308	17	748	70	3080
8	396	18	792	80	3520
9	440	19	836	90	3960
				100	4400

For lenses of f' focal length, multiply the value of D in the table with $\frac{f'}{6}$. For different value of l say l', multiply similarly with $\frac{l'}{6}$. For different time of exposure, S', multiply the table value of D with 50 S'.

USE OF ABOVE TABLE.

Having an outfit of above description, that is, a camera with a lens of 6-inch E. F., and a shutter of a speed of $\frac{1}{100}$ th of a second (nearly all shutters will have that speed), it is desired to take a ship sailing 13 miles an hour. In the above table we find opposite velocity 13 miles per hour, the distance of 572 feet, the nearest distance at which we can obtain a sharp picture.

If we can find the velocity in the above table the distance required will be opposite that velocity.

Should the velocity not be found in the table, as for example a velocity of 26 miles per hour, then we enter the table with 20 miles per hour, which gives 880 feet. Next we find velocity 6 miles per hour, which

gives 264 feet. Adding these two gives us for 26 miles 1144 feet as the distance required.

But if our outfit should have a lens of equivalent focal length of $6\frac{2}{3}$ inches instead of 6 inches, then in the above example we multiply 1144 feet with $\frac{6\frac{2}{3}}{6} = \frac{27}{24}$, which gives 1287 feet.

Suppose, again, your shutter should only have a speed of $\frac{1}{100}$ th of a second, then we multiply 1144 with $50 \times \frac{1}{100} = \frac{1}{2}$, which gives us the distance of 1430 feet with 6-inch lens, and with $6\frac{2}{3}$ -inch lens we multiply 1287 with $\frac{1}{2}$, which gives us the required distance of 1609 feet nearly.

Should in this last case a blur of $\frac{1}{100}$ th of an inch be admissible, we multiply 1609 with $\frac{1}{1000} \div \frac{1}{100} = \frac{1}{10}$, which gives the distance of 644 feet nearly.

In estimating velocities some very plain points must not be forgotten. If we are on board of a steamer moving at the rate of 14 miles per hour, and we wish to take a boat sailing at the rate of 12 miles an hour, when passing abreast we have a velocity of 26 miles an hour for the object; should we overhaul a boat sailing at that rate we have only a velocity of 2 miles per hour for the object.

A railroad train running 40 miles an hour, if taken at a distance of 1760 feet, will not show a sharp picture for some parts, such as top of the wheels, &c., as they move at a much faster rate, the top of the wheels requiring 3520 feet distance to be sharp.

Similarly the feet of men and animals move faster than the body.

Again, moving objects taken at an angle which is not a right angle with the line of its motion, will admit of a longer exposure without increase of blur. The more this angle differs from a right angle, the more may the exposure be prolonged.

A. HEGER.

—*Photographic Times.*

A CURIOUS PHENOMENON IN DEVELOPING.

SOME TIME ago, while the Editors of the *Bulletin* were working together in the dark room, and developing some rapid exposures, they noticed that on removing the plate from the developer and after slight washing, that on immersion in an alum solution the whole surface of the plate glowed with a phosphorescent light. As the phenomenon was a little startling, the effect was looked for and noted at the same period in the course of the making of each negative. It was then suggested that it would be a good idea to endeavour to ascertain the origin of the phenomenon. For this purpose some developer was mixed with the alum solution in the dark, but no phosphorescence was noted. The above operation was then reversed, and, after a number of experiments, it was found that when the developer is sufficiently weak, on pouring into it some strong alum solution, the phosphorescent light appears at the moment of mixing. This was as far as we went with our experiments, intending to return to the matter at some future date. But quite recently we see that others have noted the same phenomenon and various theories have been suggested to account for it.

At a recent meeting of the Société Française de Photographie, M. Perrot de Chaumeux, of Prissac, Department Indre, remarked that he had noted a phosphorescent light which appeared upon the surface of rapid plates on removal from the developer and immersion in a saturated alum solution. In this case the development was with separate solutions of pyrogallol and sodium carbonate according to the method of M. Audra, the pyrogallol having nitric acid in it instead of sulphuric; the plate being placed in them in the order given above, first pyrogallol then sodium carbonate. M. de Chaumeux states that the phosphorescence was not only upon the immersed plate, but also in the adjacent solution. At the same meeting, M. Pector said he had noted the same effect in using Balagny's pellicles at the moment of detaching from their supports, and another member, M. Londe, stated that he had observed the same light on developing the Balagny pellicles. M. Molteni said that phosphorescence was also produced upon developing gelatino-bromide plates in an acid pyrogallol bath; while M. Stebbing said that cutting gelatino-bromide plates with a diamond produced a like result. The general impression appeared to be that the phenomenon is electrical.

Since the above observations were published, we note that English photographers have observed the same phosphorescent light during development. Among these observers we note Mr. John Daniell, of Llanelly. This latter experimenter does not think the phenomenon an electrical one, and we agree with him. Water and saline solutions are too good conductors of electricity to admit of luminous electric discharges in them. We believe that the effect is due to chemical action only, and is probably a combination of the pyrogallol with the alum. The fact that we produced the effect without using a plate in the developer, shows that it is an action due to chemical changes between the chemicals independent of the plate or silver haloids. The kind of developer used does not appear to make much difference, M. de Chaumeux used soda, while we used mixed soda and potash, and Mr. Daniell used potash as the alkali.

The observations of MM. Pector and Stebbing are of an entirely different character. The separation of the Balagny film from its support, and the cutting of the plate with a diamond are both capable of producing electrical phenomena. It is well known that the splitting of crystals of certain minerals produces electric phosphorescence at the moment of rupture, and the separation of the Balagny films is another phase of the same

action, while the cutting of the plate with a diamond is purely friction, and we all know that produces electrical charges.

But no matter what the origin of this phosphorescent light, we think it is important to prevent its appearance during development. There can be no doubt that light of that character immediately upon the surface of the plate will produce fog. The plate is in an extremely sensitive condition, and any light not purely non-actinic would affect it. The method of prevention is a very simple one, and is to wash the plate pretty thoroughly before immersion in the alum bath. By this procedure all risk of fogging the plate from phosphorescent light is overcome.

If any of our readers have noted this phosphorescence during development and can add anything to the observations we have mentioned above, we shall be glad to hear from them, as the subject is undoubtedly a very important one in photographic practice.

—*Anthony's Photographic Bulletin.*

REVIEW OF EXHIBITION OF LANTERN SLIDES BY AMATEUR PHOTOGRAPHERS OF CINCINNATI.

THE Ex-Cincinnati Camera Club, now the Photographic Section of the Society of Natural History, gave on January 19 their fourth annual exhibition of lantern slides at the Odeon, before a brilliant audience of about fifteen hundred people, mostly friends of the members of the Club.

The pictures were projected on a screen about twenty-four feet square, by means of two oxyhydrogen lanterns.

Out of a membership of fifty-two, twenty-one members contributed about two hundred slides, from which one hundred and twenty-five were shown. A number of the amateurs being tourists, the geographical variety was quite extensive, and while covering most of the United States, also included glimpses of the Old World. By a judicious management on the part of the Exhibition Committee, the slides were divided into different classes.

Only one entry in statuary is made. Mr. Bullock giving us a perfect image of the Bartholdi Statue.

Reviewing the Exhibition in a general way, it was a meritorious display of lantern slides. Technically they compared favourably with slides exhibited by professionals, while the subjects were more original.

Perhaps the most interesting class of subjects was that of "Compositions," original or otherwise. It is natural that it should be so, since a composition calls upon our artistic faculties for successful production. Characteristic and ideal subjects will generally be more appreciated. Landscapes of which there must always be a large proportion could be improved materially and become more interesting by the addition of clouds, natural or artificial.

As we are striving to improve as we go, perhaps no one will object to the suggestion. More clouds, more coloured slides, more original compositions.

L. M. PETITDIDIER.

Our Editorial Table.

HART'S NEW NEGATIVE WASHING TANK.

MR. F. W. HART, Kingsland-green, has brought out a negative washing trough of a useful type. In the outer vessel there is an inner one in which the plates are inserted in grooves set at an angle, so as to keep the plates in a sloping position, faces downwards. The water is admitted from the top and flows downwards through the plates under such circumstances that when the jets dash against the upper ends of the backs of the plates, the water rebounds from each back to the face of the one in the adjoining groove and passes downward in a species of zig-zag fashion, which removes the hypo-sulphite very quickly and effectively from the film. The water is withdrawn from the bottom under such circumstances as to ensure the plates being always left well underneath the water even when the supply is stopped. It is a well made and useful appliance.

THREE WEEKS IN NORFOLK.

London: Wymau & Sons.

THIS little work, by J. F. Mostyn Clarke, with illustrations from pictures by Edward H. Fahey, R.I., gives a description of an "outing" by the author and a friend towards the close of last summer on board of the yacht *Rover*. The place selected was Norfolk, the country of the "Broads," many of which streams were visited. The various adventures are most pleasantly narrated, and engender a feeling akin to envy of those who had it in their power to leave the dust and heat of the city to enjoy yacht life under circumstances so pleasant as those experienced.

The work contains numerous illustrations printed from Meisenbach blocks obtained from original negatives by the author and from drawings by Mr. Fahey. These afford a very good idea of the Norfolk Broads. It of course "goes without saying" that a clever

photographer like Mr. Clarke had his camera in active requisition during the pleasant three weeks of yacht life here described.

FALLOWFIELD'S NEW CATALOGUE.

Mr. JONATHAN FALLOWFIELD, of 35 and 36, Lower Marsh, and 86, Oakley-street, Lambeth, S.E., has just issued a Special Season's Catalogue, a copy of which he has sent us. It is a very comprehensive and compendious one and embraces everything that a photographer can possibly desire. Lenses of all the recognised makers; cameras and stands of every form and for both studio and outdoor work; shutters innumerable; roll holders of various makes, and negative paper for the same; dark-room lanterns, burnishers, mounts, and dry plates in almost appalling variety—these and many other things, including optical lanterns and their appliances, all find a place in the new catalogue of Mr. Fallowfield.

ISOCROMATIC PLATES.

We have tried some isochromatic plates sent to us by Mr. B. J. Edwards. In order to test them effectively, we employed a card containing a device in what are, *visually*, strongly contrasting colours, a very dark blue cross on a bright lemon ground. These are so carefully balanced as to give with ordinary wet collodion scarcely a trace of an image at all, and such we found to be the case. With the isochromatic plates the image was well marked, and this in a degree exceptionally so when we interposed behind the lens a piece of glass of a very delicate yellow colour, under which circumstances we obtained a vigorous dark cross on a light ground. This attests the value of isochromatic plates.

Department for Inexperienced Photographers.

SILVER PRINTING ON PLAIN PAPER.

While we quite admit that there is a great charm in a photographic print having a surface as smooth and glossy as glass itself, yet equally so is there a peculiar charm in one totally devoid of all glaze.

Regarding the former, as we have prepared practical instructions for effecting the end in the most perfect manner, we shall say nothing concerning it here.

It will have been inferred from the previous article on this subject, that silver printing may be effected on plain paper quite as well as on that which has been albumenised. We have seen many excellent photographs made upon ordinary writing paper.

If any reader thinks of trying his hand at such practice, he must select a smooth, hard-sized wove, not laid, sample of paper.

This is to be salted by sponging or brushing it over with a solution of chloride of sodium (common salt), six grains to the ounce of water, and then suspending it to dry. But a much richer effect is obtained by the addition of three grains of gelatine, which imparts vigour to the print by keeping it more on the surface without imparting a glaze like albumen. Instead of brushing the solution over, it is much better to pour it into a flat dish and allow the paper to float on it for a minute. When dry it will remain good for a long time.

To sensitise the paper, float it for two minutes upon a bath of ammonio-nitrate of silver, made by dissolving fifty grains of nitrate of silver in an ounce of water (or in a larger quantity, adopting the same proportion), and then adding to it strong ammonia drop by drop. The effect of this addition is to cause a dirty-looking dark brown precipitate to be formed in the previously clear liquid, and the ammonia must be slowly added until indications appear that the liquid is beginning to become clear. Now stop and shake or stir the solution to mix the ammonia with it, when if not yet clear add more, but only by a single drop at a time, followed by stirring or shaking after each drop. Cease adding ammonia after the solution has become almost clear, for it is better that this stage be not quite reached than that there be an excess of ammonia. If the mark should have been overshot, a little more solution of nitrate of silver must be added.

This solution, when filtered, forms an exciting solution for plain paper which yields prints of great beauty of tone. It is not so well suited for albumenised paper. But for plain salted paper, while the above-described ammonio-nitrate of silver bath is undoubtedly the best, yet will a plain nitrate of silver solution also answer well, although, so far as our experience goes, it will not give such rich, deep chocolate blacks as the other.

The paper having been dried is ready for exposure.

Concerning the toning and fixing, this may either be done in the way described in a previous chapter on this subject, or, to save trouble, both these operations may be merged into one. To this end the printing should be carried till the image is nearly veiled in obscurity, and the

pictures, after being rinsed in plain water, immersed in a bath prepared according to the following directions:—

In four ounces of water dissolve one ounce of hyposulphite of soda, fifty grains of sulphocyanide of ammonium, and thirty grains of phosphate of soda. After these have been dissolved, add to it two grains of chloride of gold previously dissolved in a little (say, two or three drachms) water.

The toning and fixing go on simultaneously, and the prints are allowed to remain in this until they have acquired a very rich black tone, by which time the effect of the over printing will have been obviated by a corresponding reduction.

After removal from the toning and fixing bath, the prints must be well washed.

The solution will remain good for a considerable period by strengthening it occasionally with a few drops of gold solution and the addition of fresh hyposulphite of soda solution. When it is considered to be quite used up by long keeping or frequent use, it may be poured into a convenient bottle of large dimensions, or jar, in which other waste hyposulphite solutions are kept, for by a simple chemical treatment hereafter to be described, at least two-thirds of the silver employed in the sensitising of the paper can be recovered, thus reducing to a material extent the expenses incurred in riding the photographic hobby.

What has been here said about the saving of the waste hyposulphite of soda from fixing prints, applies with equal force to that employed in the fixing of negatives, whether on glass plates or paper.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 3530.—“Improvements in the Manufacture of Sensitive Photographic Films and in Apparatus therefor.” Communicated by G. Eastman. A. J. BOULT.—*Dated March 8, 1887.*

No. 3652.—“The Keeping Count of the Number of Prints Printed and to Print from Photographic Negatives.” N. S. BROWN.—*Dated March 10, 1887.*

PATENTS COMPLETED.

AN IMPROVED INDICATOR AND LOCK FOR THE SHUTTERS OF PHOTOGRAPHIC DARK BACKS OR SLIDES.

No. 3325. FREDERICK HAZELDINE, Lant-street, Southwark.—*March 9, 1886.* My invention relates to a combined indicator and lock for photographic dark slides or backs whereby the operator can ascertain at a glance whether the shutter has, or has not, been drawn out, and whereby the shutter is absolutely prevented from being accidentally drawn out a second time so as to give a double exposure to the same plate or film.

The invention consists essentially of a detent or latch capable of being set in such position as to permit of the shutter being drawn out once for the purpose of exposing the plate or film in the camera, and adapted to be automatically set in such other position on the pushing in of the shutter after exposing, that it will act as a stop to prevent the shutter being drawn out a second time.

One arrangement is as follows:—The detent is pivoted to the frame of the dark slide or back at one side of the shutter, and is adapted to engage with a notch in the edge of the latter. The detent is acted on by a spring, and it may be set in such position as to offer no obstruction to the drawing out of the shutter a first time, but on the pushing in of the shutter after such first withdrawal, it will be caused to assume a different position and to engage in the notch of the shutter, so as to prevent the withdrawal of the shutter a second time. The detent may be pivoted between the two limbs of a U-shaped spring, which alternately acts on the detent at opposite sides, the other limb for the time being acting as a stop, but the spring may be otherwise arranged so as to accomplish the same end. For instance, a single spring may be so arranged as to act on the detent in opposite directions from its two extreme positions.

According to another arrangement the spring detent or latch is placed at the end of the dark slide or back, so as to engage with the inner end of the shutter. In this case the detent is hooked and engages with a stud, or its equivalent, on the shutter. The detent may be set for the withdrawal of the shutter by being held back out of engagement with the said stud by a shoulder on the shutter. On the withdrawal of the latter the detent or latch falls into such position as to engage with the stud on the shutter being pushed in, so as to prevent the withdrawal of the shutter a second time.

The claims are:—1. The combination with a photographic dark slide or back, of an automatic locking device, constructed and operating substantially as herein described and shown in the drawings, so that when suitably set it will permit the withdrawal of the shutter of the dark back once, and will, by the act of pushing in the shutter after such withdrawal, automatically lock the shutter in the closed position substantially as specified. 2. The combination with a photographic dark back or slide of the automatic locking device and indicator substantially as herein described and illustrated in Figures 1 to 5 of the drawings, and consisting of a spring actuated detent or latch, and of a notch or shoulder for engagements therewith, the detent being arranged for operation at the side of the shutter as specified. 3. The combination with a photographic dark back or slide of a spring-actuated hooked detent, and of a fixed catch for engagement therewith, the detent being arranged for operation at the end of the shutter as specified.

A NEW OR IMPROVED ADJUSTABLE DIAPHRAGM FOR PHOTOGRAPHIC CAMERAS.

No. 3879. WILLIAM JAMES LANCASTER (trading as J. Lancaster & Son),
Colmore-row, Birmingham.—March 19, 1886.

My invention relates to photographic lens diaphragms, employed in photographic operations, to determine and regulate the amount of light that shall be admitted into a camera; thus the time for exposure in photographic operations depends upon the light upon an object about to be taken, and the size of the aperture of the diaphragm used with the lens.

Usually a series of various-sized diaphragms are employed, or rather a series of diaphragms with various-sized holes. This is objectionable, inasmuch as there is no means of varying the difference between the size of one aperture and the size of one above or below it, so as to give a mean difference.

By my invention the diaphragm is made adjustable, so as to be able to control the size of the aperture, according to the varying requirements and will of the operator; thus the aperture in the diaphragm is expanded or enlarged in such a manner that an infinite variety of apertures can be readily obtained.

The diaphragms or series of plates which constitute the diaphragm, form a part of the mount of the lens, thereby avoiding any loose diaphragms or parts whatsoever; and further, the aperture necessary for certain conditions of light can be predetermined by an index finger, before the former of which the latter travels.

The adjustable diaphragm is constructed as follows:—

Within the inside, and crossing the lens tube, is a circular plate or disc with a hole in its middle, of the full size which the aperture in the diaphragm can acquire; the diaphragm is a compound or segmental one, made up of a series of thin plates overlapping each other, but so disposed or arranged with respect to each other that their radial curved inside ends or parts enclose a circular or nearly circular space or opening; so that on the concave or curved inside edges of the ends of these plates being moved or made to approach each other, a greater or less aperture or hole is thereby produced.

The parts constituting the diaphragm, and the manner in which the curved or crescent inside edges of the plates are made to approach and recede from each other, is as follows:—

Each plate of the series of plates consists of a plate concave at one end to the radius or about the radius of the larger-sized aperture which the plates will make when fully opened out or expanded. This curved part forms the inside end of the plate. The other or outside end is pivoted or hung eccentrically upon the inside of the disc, with a hole in its middle as before described. The said pivot forms a centre upon which the plate turns inwards or outwards, in approaching or receding from the centre of the lens tube; and situated below, and somewhat in a line with the said centre, is a stud or pin, upon the face on the side of the plate, which engages and works within one of a series of radial tangential slots cut within a plate or disc with a hole in its middle, which works or is moved in front of the series of plates by a protruding arm or finger working through a slot cut in the outside tube of the lens.

Each of the said plates constituting the diaphragm are pivoted, and have studs like the one described, and each of the said studs of the series work within the slots as described; and further, each of the plates overlap each other, so that the edges of the one extend over the edges of the other, so as to form as it were a solid plate, but with an aperture that is able to be increased or decreased in size at pleasure.

Upon the top, outside of the lens tube, and in front or surrounding the slit through which the finger works, is an index or graduated scale before which the finger is moved, so that a person, by moving the finger in front of one or other of the numbers or figures upon the scale, can have the size of aperture required. Thus the top scale may be 4, 6, 8, 10, 12, onwards, and bottom or second line "speed" 1, 2, 3, 4, &c.

The moving of the index finger or arm through a quadrant of a circle for closing, or for obtaining a smaller aperture, the studs on the plate of the series of plates, which may be six, eight, or any other suitable number, are made to travel down the tangential slots or slits, and each plate is at the same time turned inwardly upon the pivots upon which they are hung, thereby causing the curved inside ends to collectively approach each other and make a contracted aperture. When a larger aperture is required the arm or finger is only required to be turned in the reverse direction, when the plates are collectively made to slide over each other, and recede from the middle or axis of the lens, by turning eccentrically upon the pivot upon which they are hung, and by the studs on their sides travelling up the slits on the disc or plate wherein they are formed being partially rotated.

A supplementary disc, with a hole in its middle, comes in front of the plate with the tangential or inclined slits, in order to preserve or protect the same from injury or otherwise.

The claims are as follows:—1. A photographic lens diaphragm, or a diaphragm for photographic purposes, with, or provided with, an adjustable aperture or opening which admits of a variable expansion and contraction, and which said diaphragm consists of a series of thin plates (or two or more plates) or the equivalents of plates, which respectively overlap or underlap each other, preferably at their inner radiusly-curved gapped parts; so that on the said plates or their equivalents being collectively moved to or away from a common centre a varying-sized circular, or nearly circular, or other shaped aperture or opening is thereby obtained. 2. An adjustable photographic lens diaphragm, consisting of a series of pivoted swinging plates which overlap or work one upon another in such a manner that their inner concave gapped parts are made to enclose and form an aperture more or less circular, and which said plates are operated, or opened out, or drawn together, for giving a greater or less opening, by a plate (turned by a ring or finger) provided with, or having cut therein, tangentially or other eccentrically arranged slots or gaps wherein pins or their equivalents carried by the said plates work, the parts being arranged, combined, and operated in the manner and for the purpose herein described and set forth. 3. A photographic lens diaphragm with an adjustable aperture composed of a series of overlapping radially-disposed plates with their inner ends concave or gapped, which on being radially drawn together or opened out produce varying-sized apertures, substantially as described. 4. Combining with a lens tube, an adjustable fixed diaphragm. Also providing combined lens tubes and adjustable diaphragms with graduated scales or equivalents thereof, for the purpose substantially as described and set forth.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
March 21	Notts	Institute, 9, Shakespeare-street.
" 21	Blackburn	
" 22	Great Britain (Technical)	5A, Pall Mall East.
" 22	Bolton Club	The Studio, Chancery-lane, Bolton.
" 23	Photographic Club	Anderston's Hotel, Fleet-street, E.C.
" 24	Burton-on-Trent	
" 24	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

At the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, on Thursday, March 10, Mr. L. Medland presided.

Mr. A. L. HENDERSON asked of what "anti-calcaire," an advertised substance for removing lime from common water, was composed. Added to a solution of gelatine it made it thin during the night and left a precipitate at the bottom. The solution had a taste something like soda; there appeared to be lime in it, for some of the "anti-calcaire" would not dissolve.

Mr. W. H. HARRISON thought that it might be hydrate of lime, which was added by certain water companies to waters holding bicarbonate of lime in solution, the whole of the lime being then precipitated as carbonate. Oxalate of ammonia was capital stuff to precipitate lime from water. In both these cases a mere trace must be added to precipitate the lime in the water; there should be no excess.

Another speaker said that it might be "soda lime," which was much used in analytical chemistry for the purpose.

The question was asked, "What is the best method of drying collodion-bromide emulsion after it is washed?"

Mr. HENDERSON: The centrifugal separator.

Mr. J. B. B. WELLINGTON used methylated spirit.

Mr. A. MACKIE said that Mr. W. B. Bolton had published that methylated spirit for the purpose injured the emulsion in most cases.

The HON. SECRETARY had tried Mr. Bolton's formula as published in the ALMANAC, and it did not work in his hands.

Mr. ATKINSON dried the emulsion by the aid of a sand bath.

The CHAIRMAN dried it by squeezing it in a vice.

The HON. SECRETARY had dried it effectually with a lemon squeezer. Imperfect drying was the chief cause of failure of those who first began to work the process.

Another question was, "What is the best method of reducing over-dense collodion transparencies?"

Mr. WELLINGTON recommended the ferricyanide of potassium and thio-sulphate of soda method.

Mr. MACKIE asked if anyone had ever tried the ferric-oxalate method recommended by Mr. W. Willis.

Mr. A. HADDON said that the ferric-oxalate must be followed by hypo.

Another question was, "What is the best work on photographic chemistry?"

Mr. HENDERSON: Hardwich's, edited by Mr. J. Traill Taylor.

Mr. J. TRAILL TAYLOR exhibited some photographs taken in Paris by the electric light, as published in last week's JOURNAL, and sent to him by Professor Stebbing. No better photographs could be taken by daylight, and what had been done by the electric light ought to be possible by the magnesium light, which was much cheaper. A good way of getting rid of the smoke of magnesium was to burn the metal in a close vessel furnished with a long wire-lined tube of common calico, of large diameter, the further end of the tube being made to pass out of the window. Grant and Solomon's magnesium lamp would do to pass out the riband for burning.

Mr. HARRISON said that the price of magnesium bore relation to the price of sodium, so there would probably be another great fall in cost, for within the last month or two Mr. Castner had found out how to make sodium at 8½d. a-pound, instead of about 4s. a-pound as heretofore; the selling prices of the sodium would, of course, be higher. Furnaces had been erected for the manufacture.

Mr. TAYLOR stated that there were sufficient demand for it, magnesium, as made at present, could be sold at a shilling a-pound. Magnesium in powder had been burned with success at some of the *conversations* at one of the meetings of the British Association; the first night the light was offensively cold; the second night they added too much strontium to the powder, and the light was offensively pink.

Mr. HARRISON said that powdered magnesium was cheaper than the riband in first cost, and could be burnt for photographic purposes to more advantage than the other, and without danger of the light suddenly going out.

Mr. HENDERSON remarked that a Glasgow man had a good way of burning magnesium in oxygen.

Mr. G. D. Plover exhibited Hart's hand apparatus for burning magnesium riband.

An exhibition of lantern pictures followed; Mr. Medland contributed zoological subjects and views of India and Yarmouth; Mr. C. H. Cook, views taken in Sussex; Mr. Wellington, general views, and views on the Banks of the Wye; Mr. Thomas Kerr, copies of comical engravings; and Mr. Harrison views taken in Switzerland.

Mr. J. G. Kitchener and Mr. Davenport Knight were elected members of the Association.

The meeting then broke up.

CAMERA CLUB.

On Thursday, March 10, Mr. Norman Macbeth, R.S.A., lectured upon artistic composition. Mr. Adcock occupied the chair.

Previous to the reading of the lecture, Mr. H. J. Gifford exhibited a Newman shutter which was made to fit into the diaphragm slot, was worked by com

pressed air, and gave exposures from what was claimed as one one-hundredth of a second to any desired length of time.

Mr. Alfred Deed handed round some deeply interesting photographs of large size, showing some effects of the recent earthquake at Mentone.

Mr. MACBETH then proceeded to give his address, *On the Composition of the Pictorial*. The lecture was illustrated by diagrams and pictures shown by the optical lantern, and it treated chiefly of rules of guidance as to selecting the most effective boundaries for pictures and as to the arrangement of the principal objects so as to secure pleasing balance and effect. In regard to the proportions of pictures, Mr. Macbeth stated that the smaller of the two dimensions being fixed upon, the length should be obtained by taking the diagonal of the square formed upon this smaller dimension. This surface should be divided up into subdivisions of uneven numbers. Leading objects and those placed or composed to balance them must be on the intersections of these lines, if a pictorial representation is to be secured. After giving the substance of the lecture, which had already appeared more fully in the photographic papers, Mr. Macbeth went *seriatim* through a selection of pictures thrown on the screen, explaining how their boundaries had been fixed and objects placed according to these rules. The greatest stress was laid on the use of such rules of guidance in deciding the limits of a pictorial composition when trimming the photograph.

The CHAIRMAN, in calling for discussion, expressed his satisfaction at having acquired some new and useful knowledge from the lecture. He had come one hundred and four miles chiefly to hear Mr. Norman Macbeth. He knew that discrimination and courage were required in trimming photographic pictures to their most pictorial proportions, and said that much more attention should be devoted to this point by photographers. Many of Mr. Macbeth's remarks and those indications of figures which he had painted in where required upon the lantern pictures showed us a weak point in photography as compared with painting, namely, the difficulty in regard to placing figures or objects, such as cattle or ships, in just the place where there was a felt want. He had been greatly gratified at seeing some of Mr. H. P. Robinson's fine work upon the screen.

Mr. W. K. BURTON said he felt the art side of photography somewhat out of his domain. In regard to so-called instantaneous exposures, Mr. Macbeth had stated or inferred something which was not quite correct when, as he understood him, he suggested that much error could not be made in shutter exposures. There was just as great a difference in effect on the plate between one-tenth and one-twentieth of a second in rapid exposures with large apertures as between ten and twenty seconds in long timing.

Messrs. DAVISON and RODGERS expressed some scepticism as to the value and reasonableness of the system proposed by the lecturer.

Mr. WOLLASTON asked whether the old masters built up their compositions by recourse to a mathematical arrangement to find "*forte*" points.

Mr. H. H. O'FARRELL questioned whether the theory of *forte* points, like other art rules, was not capable of being over refined, and pointed out that in one picture exhibited by the lecturer and divided by him into seven divisions there was an object of interest in each division. He thought that rules of art could never be said to be firmly based unless capable of an explanation grounded on the physiology of vision. The eye, for instance, had only a very limited range of vision, and was constantly travelling over the object viewed. The *forte* points might possibly be explained as being situated on the extreme edges of the area of distinct vision, and thus forming a series of steps leading the eye across the picture. So, again, if a curve were more pleasing to the eye than a straight line, the reason probably was that the eye moved over a curve with less muscular effort than along a straight line. Whatever might be thought of these examples, it seemed clear that until some scientific basis was found all canons of art must be more or less unsatisfactory.

Mr. MACBETH, in reply to criticisms, stated that those pictures, thrown on the screen without the lines on which the composition was arranged being shown, had been felt as pleasing, but they had been treated in the same way as those exhibiting the subdivisions. In seeking to construct a composition pleasing in regard to balance and arrangement, he did not see what else besides such a system there was to rely upon. He would emphasise it particularly in regard to the fixing of the final boundaries of the picture in trimming. As to Mr. O'Farrell's remarks in regard to the picture showing seven figures in a line across the picture, each on a *forte* point, he would say that he did not suggest the plan as serving more than merely an indication in instantaneous work. It would assist in making the best possible arrangement of such a picture when fixing the boundaries.

A hearty vote of thanks was accorded the lecturer for having opened up a most interesting discussion and for having directed attention to the subject of artistic composition in photographic work.

On Thursday, March 24, the subject is *Alpha Paper*, to be opened by Mr. G. Davison.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

The ordinary meeting of the above was held on Thursday evening, March 10, at the Free Public Library.—Mr. J. A. Forrest (President) in the chair.

Messrs. James Fullerton and H. Wilkinson were elected members of the Association.

Messrs. W. Watson & Sons' new detective camera was exhibited during the evening, and excited interest on account of its novelty.

Some discussion was raised by Messrs. P. LANGE and H. N. ATKINS on the merits of the improvement in glass being introduced by Mr. Abbe, of Jena, under the auspices of the German government. It was prognosticated by them that 1887 would be a Jubilee year for photographers, so great would be the improvements in lenses as regards optical properties and price, the latter "a consummation most devoutly to be wished."

The chief attraction of the evening was a lantern exhibition illustrating *A Tour through Holland*, a number of splendid slides, nearly all from instantaneous negatives, being kindly lent for the occasion by Mr. Bernard Conlon, Mount Pleasant, Liverpool, which depicted the topography and social life of that country in a most vivid manner.

Mr. WILLEM S. LOGEMAN, "native hero and to the manner born," "personally conducted" the tour, and before the close of the evening had considerably impressed his audience with the amount of historic and general information he was possessed of, for, as the VICE-PRESIDENT remarked, when proposing a vote of thanks (which was accorded with more than ordinary cordiality), he felt as if he had just returned from travelling in Holland, and that, too, with much pleasanter recollections than if he had recently crossed the North Sea and paid the customary tribute to Neptune, a tax his marine majesty most zealously enforces, as those who have travelled *via* Grimsby or Harwich will painfully recollect. Amsterdam and Rotterdam of course afforded the largest number of views, but besides these places visits were paid to Dordrecht, Delft, Scheveningen, Leyden, Haarlem, Aekmar, Hoorn, Marken, La Haye, Utrecht, &c. Mr. A. W. Cornish manipulated the lantern.

The annual dinner of the Association was held on the 5th instant at the Grand Restaurant, Argyle-street, under the chairmanship of the President, supported by Mr. Paul Lango as Vice.

After the usual loyal toasts the Chairman said he rejoiced in the continued success of the Association—an Association which had his warmest affection and excited his deepest interest; an Association whose birthplace happened to be the very room they were then occupying, and where harmony and good feeling prevailed so generally; and an Association over which it gave him the greatest delight to preside. He concluded with a fraternal greeting to all followers of the "black art."

Messrs. Faltin and Lango entertained the party with some charming German songs and choruses, while M. Gillon ably represented *La Belle France*. Mr. J. H. Day's fine rendering of a German song met with great approval and applause, as it deserved. Mr. B. J. Sayce, one of the pioneers of photography, and the photographic gold medallist of the Inventions Exhibition, a gentleman of whom the Association is justly proud, gave a charming Scotch song with bagpipe chorus while the "Anvil Chorus," from *Trovatore*, with penknife and tumbler accompaniment, proved an attractive item.

Thoughts of Mrs. Candle sitting up at home acted as an all-powerful "reducer," the meeting breaking up at a respectably early hour, all thoroughly pleased with their evening's enjoyment.

DERBY PHOTOGRAPHIC SOCIETY.

THE members of the Derby Photographic Society held their usual monthly meeting at their rooms, 33, Victoria-street, on Tuesday, March 8, when Mr. RICHARD KEENE exhibited and described over one hundred lantern slides made and lent by Mr. J. B. B. Wellington, of London, which were greatly admired by the members present, of which there was a large number; and a unanimous vote of thanks was accorded to Mr. Wellington for lending the slides, to Mr. Keene for his description of them, and to Mr. Saxelby for the use of his lantern.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting was held in the Council Chamber of the Midland Institute on the 10th instant. There was a crowded attendance of members and friends, Vice-President W. J. Harrison, F.G.S., in the chair, and the minutes of the last meeting were read and confirmed.

Mr. J. Pumphrey was nominated for election.

The CHAIRMAN announced that the meeting would be made special for the purpose of exhibiting the lantern slides sent from America, the use of which was given by the courtesy of the Camera Club of London.

The slides, numbering about two hundred, were then shown on the screen, Messrs. Karlse and Place manipulating the lantern and slides. Many of the pictures were of great beauty and elicited much applause, the instantaneous views of moving steamboats, &c., being exceptionally meritorious.

On the completion of this series of views, Mr. CHARLES PUMPHREY moved a vote of thanks to the Camera Club for the loan of the slides, and mentioned the great use to amateurs of being able to see the productions of other societies, thus creating by criticism a sort of friendly rivalry to gain as far as possible the *par excellence* of photographic scenes and pictures.

Mr. A. ROBINSON seconded the motion, and it was passed unanimously.

The remainder of the evening was devoted to the exhibition of a number of slides made by the members themselves, and which forms the nucleus of the collection being got together by the Birmingham Society which it is intended to lend to other Societies in exchange for the loan of theirs for the purpose of exhibition at their different meetings.

At the conclusion the Chairman announced the subject for the 21th instant, namely, *The Humorous Side of Photography*, by Mr. J. W. Welford.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

A REGULAR meeting of the Society was held on the 9th instant in the Mayor's Parlour, Old Town Hall,—the President, Mr. George Bankart, in the chair.

There was a good attendance. Two members were balloted for, and unanimously elected.

The President then introduced Mr. PILSBURY, who gave his paper on *Composition in Photography*. Coming from such an eminent authority, the remarks were received with deep attention, and the various points touched on were at once recognised, and the lecture was such that every one present duly appreciated the hints and information given by no sparing hand. Mr. Pilsbury opened by saying that while he could not speak to photographers as a photographer, his knowledge of the science being quite nominal, yet he could speak to them as one who could advise as to the best means of obtaining truly artistic and pictorial effects. Each point introduced was illustrated with an example either by photograph, drawing, or sketch on the blackboard, which materially assisted the members in grasping the idea he wished to convey.

The principal feature to be avoided in landscape photography was the introduction or repetition of straight lines or geometric forms, which could frequently be avoided by changing the standpoint of the tripod, and the undulatory form of outline was to be sought rather than any other to enhance the pictorial value of the photograph. His remarks as to lighting a picture were such as to completely revolutionise the ideas of most of the members, and yet when brought home by illustrations were incontrovertible.

The attention of the members was maintained until a late hour without any symptoms of flagging interest, and at the close, on the motion of the President, a hearty vote of thanks was tendered to Mr. Pilsbury and carried with acclamation.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held on Friday, the 4th instant (postponed),—the President, Mr. T. S. Yeomans, in the chair.

The minutes having been confirmed, discussion was invited as to fixing the excursions of the coming season. Finally it was determined that there should be three whole-day excursions, namely, to Haddon Hall, York, and Dovedale, on some Wednesday or Thursday, as might be arranged by the Council according to convenience.

The Competition subjects were then proposed, and from which six were then determined by vote as follows:—"Sunshine and Shadow," "Old Building within Ten Miles of Sheffield," "Country Life," "Animal Life," "Street Scene in Sheffield," and "Workshop Interior."

Mr. C. F. Coombe was elected a member.

The PRESIDENT announced his intention of offering a prize for competition.

In order to give the smaller plates a chance, it was proposed to give a prize for the best series of three views taken on half-plates and under during the season; the original plate to be printed to its full dimensions, and not to be cut down from a larger size.

After arranging a few remaining details as to the forthcoming *conversazione*, the meeting broke up.

A *conversazione* was held by the above Society on Wednesday evening in the Masonic Hall, and was well attended. A large number of views, chiefly the work of the members, and embracing the various prize and competition pictures of the past season, were exhibited on the walls of the Hall, and there were also shown specimens of appliances, &c., used in connection with the art of photography. The members' work was, in many instances, of high merit and fully equal to that of professionals.

Mr. E. H. Pearce lent H. P. Robinson's *Sunset and Dawn*.

Photographic materials and appliances were exhibited by Hebbert Brothers, who had on view one of J. R. Gotz's newest pattern cameras. Culey & Preston also showed an assortment of cameras, tripods, and dark-room requisites, and Taylor Brothers one of their newest whole-plate cameras. Mr. J. Barber showed his newly patented dissolver for the limelight, also a nicely got-up "saturator" for the ethoxo light. Mr. G. W. Atkins lent, amongst other objects, a photo-micrographic apparatus attached to his camera for enlarging microscopic objects, also a microscope depicting the eye of a dragon-fly; in each facet of which a portrait or other object was seen, showing thereby that each facet contained its own lens.

Mr. J. W. Charlesworth exposed and developed some photo-micrographs with the aid of a portable dark room, lent by Mr. G. Bromley, his microscope being lighted by means of a small electric lamp.

Mr. Bromley had some fine stereoscopic prints, also a microscope showing micro-photographs.

During the evening a large number of views, taken by the members, and showing places of interest in Sheffield and neighbourhood and other places in England, were thrown upon a large screen by Mr. C. Yeomans, Hon. Treasurer, by means of his optical lanterns illuminated by incandescent electric light—a novelty to most of the audience. The lamps were worked by thirty-two cells of an improved mercurial battery of the single liquid class, and showed a good ten-foot disc, being but little inferior to the blow-through jet, against which, however, it was not expected to compete.

Some very fine examples of photo-micrography, by the Woodbury process, comprising foraminifera and other shells, blow-fly's tongue, &c., were also displayed: these being probably some of the finest results attained in this direction.

Mr. J. A. Rodgers presided at the pianoforte, and gave selections of operatic and other music at intervals.

BRADFORD AMATEUR PHOTOGRAPHIC SOCIETY.

THE second exhibition of this Society is now open in the Bradford Art Gallery and Museum. About two hundred pictures comprise the exhibition, the work of members of the Society. The subjects treated are as varied as are the resources open to the student of the photographic art, whose artistic instincts may lead him to plant his camera in the sylvan glades or mossy dells of his own country, or impel him to try his hand at Alpine scenery; and considering that this is only the second season of the Society, the exhibition is said to be one of a most creditable character. As an adjunct to the collection of paintings and objects of art now on view in the Art Gallery, the exhibition is an acceptable and appropriate contribution. The exhibition also takes the form of a competition, the coveted honour being the silver medal awarded in each class, a bronze medal being given as second prize. Prizes are awarded for the three best pictures in each class. The exhibits were judged by three professional artists, namely, Mr. W. Eskett, York; Mr. T. Illingworth, Halifax; and Mr. J. Gunston, Bradford; when the following awards were made:—Class I., "Best landscape on full plate and upwards:" first prize, H. Forsyth; the second prize was awarded to D. G. Law. Class II., "Best landscape half-plate and under full-plate:" first prize, M. B. Wallace; second prize, D. G. Law. Class IV., for "The best instantaneous photograph:" first prize, W. S. Smith. Class V., for "The best interior:" first prize, G. L. Salt; second prize, W. H. Scott. Class VI.

"Best architectural subject:" first prize, H. Forsyth. For the "Best portrait," and the "Best composition picture," "Highly commended" was attached to photographs by G. L. Salt and C. H. Smithson. Mr. J. E. Fawcett also exhibits, "not for competition," an interesting group of photographs, representing natural objects, photographed with the microscope. We understand that the exhibition will be open for a few weeks.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Committee of this Association met at 181, Aldersgate-street, on the 7th instant,—W. Bedford, Esq., in the chair.

The minutes of the previous meeting were read and confirmed.

Messrs. T. Bedding, Edwin Cocking, J. Crocker, J. Humphries, E. T. Hiscock, H. Keen, H. J. Klosz, E. G. Priddle, J. A. Rigby, F. A. De Saules, O. A. Smith, A. Spiller, T. Watson, L. Wolff, and E. De Zuccato were elected members of the Association.

The correspondence having been dealt with, the meeting discussed at considerable length various methods, having in view the desirable object of extending the knowledge of and obtaining additional strength to the Association numerically and financially, feeling sure that all cognisant with the aims of the Association would appreciate and support the Committee in their efforts to help the unfortunate.

Having heard with regret of the accident to the Rev. A. Tooth, who had placed a vacancy in his Orphanage at the disposal of the Association, a vote of sympathy was passed.

CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

THE March meeting of the above Society was held on the 11th instant,—Mr. S. W. Allen, the President, in the chair.

The arrangement for Mr. T. C. Hepworth's lecture was confirmed for the 23rd instant, and will take place at the Lesser Park Hall.

The Secretary was instructed to obtain an album, contributions for which will be solicited from the members, and when filled presented to the Cardiff Infirmary. If sufficient prints are received it is proposed to present albums to other institutions of the town. The Hon. Secretary would be pleased to receive contributions from friends at a distance.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of the Association was held on March 3, in the Rooms, 207, Bath-street,—Mr. Lang, F.C.S., in the chair.

Minutes of last meeting were read and confirmed. Mr. Thomas Nisbet was unanimously elected a member.

A quantity of apparatus sent by Mr. A. L. Henderson, London, was shown, and caused great interest among the members. Among the things sent may be mentioned the following:—Calotype camera, emulsion distributor, spectacles for dark room, pictures with green fog showing optical result, pinhole camera with pictures taken by same, specimen of isochromatic photography produced by the intervention of yellow glass between the object without any staining of the plate, photograph taken by gaslight of the dinner of the London and Provincial Photographic Association, &c. After they had been viewed by the members, and a good deal of discussion and questions asked regarding them, the CHAIRMAN said the Association was greatly indebted to Mr. Henderson for these interesting exhibits, he therefore proposed that a vote of thanks be accorded Mr. Henderson, which was given.

Thereafter the CHAIRMAN called upon Mr. William Goodwin to say a few words about isochromatic photography.

Mr. GOODWIN said that this was a subject he had lately given some attention to, and Mr. Lang knowing that asked him to come to-night and give the Association the benefit of his knowledge thereon. Some fourteen years ago chlorophyl and turmeric had been recommended for the purpose of making plates more sensitive to certain rays of the spectrum, but very little had been done in this direction until a few years since, when some of the dyes procured from coal tar had been used with marked success for this purpose. Amongst these were the eosines and the erythrosines, about which so much had appeared in the journals lately. In his experiments he could not say he had made any discoveries; he had contented himself by trying the various formulae which had been published, and he had got the best results with that published by Mr. Wellington. With this formula, however, he found that instead of soaking the plates in the carbonate of silver and erythrosine at the same time, it was better to soak first in the carbonate of silver and afterwards in the erythrosine, using the two separately. Mr. Goodwin proceeded by the aid of the black board to show by means of curves the effect of various dyes when used in isochromatic photography, remarking among the dyes that those only that had a chemical action on the film of the prepared plate were of any use. At the close of his remarks Mr. Goodwin passed round a series of photographs of a bouquet of flowers taken on ordinary and isochromatic plates, which showed the great advantage of the latter in coloured subjects.

A question asked by a member at Mr. Goodwin was: Seeing the wonderful result got by Mr. Henderson simply by the use of a coloured screen, could the same results shown in the photographs of the flowers not be procured without going to the trouble of staining the film?

In answer, Mr. GOODWIN said that he had begun experimenting in isochromatic photography on a scale of colour he had made himself, and had got some most extraordinary results, the yellow and the red photographing almost white. He could not for some time understand this, until he had examined the colours he had used in making the scale, and found that they were so much made up of white to give them body that they were useless for the purpose. He thought that something of the same kind was the explanation of the photograph sent by Mr. Henderson, as the yellow glass when used with an ordinary plate on a flower had no perceptible effect.

After a good deal more conversation, Mr. BELL proposed a vote of thanks to Mr. Goodwin for the interesting manner in which he had dealt with the subject of isochromatic photography.

This vote was responded to, the members having fully appreciated Mr. Goodwin's kindness in giving the Association the benefit of his knowledge in this department.

The evening being by this time pretty far advanced, several matters of interest were carried forward till next meeting, and the members separated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE fifth ordinary meeting of the session was held on Wednesday evening, March 2,—The President in the chair.

A communication from Mr. ANDREW PRINGLE, entitled *A Javot in Spain*, was read, in which the writer described his experiences, photographic and otherwise.

Mr. F. BRIGLMEYER gave a demonstration of the exposure and development of the Eastman bromide paper, using the formula recommended by the makers. The exposures were successfully made by magnesium light.

Mr. R. BOW, C.E., said that in his experience a short development tended to greyness of tone, while a long and restrained treatment yielded a reddish or chocolate colour.

Mr. W. FORGAN thought that the best results were to be obtained by commencing the development with a weak solution, which permitted of complete control and allowed a deliberate judgment of the progress of the image. He got good black, but not brown tones, with Eastman paper.

Dr. THOMPSON, when first experimenting with the Alpha paper, two years ago, had conceived that if the same means employed for toning gelatine emulsions on glass were employed for paper films like results should follow, and he had found that to a great extent it was so. He thought that an exposure exactly suited to the character and density of a negative was required in order to secure the fullest detail possible and to approach the appearance of the silver print.

Mr. J. MCKEAN had not seen bromide paper to be so suitable for small work, and the probability was that its chief use lay in the making of enlargements.

Mr. WILSON said he had developed a good deal of Eastman paper, and had satisfied himself that a simpler formula than that published was quite efficient. He made a saturated solution of iron and a similar one of oxalate, and to three parts of the former he added one of the latter, the mixture being of a wine colour. This he found to act well, and he got purple-black tones. He suggested that a portion of an evening might also be devoted to the making of lantern transparencies.

Mr. Forgan exhibited some early examples of *cartes-de-visite* taken by Disderi, who might be called the inventor of this style of portrait. They were in a remarkably good state of preservation.

The Secretary exhibited Mr. F. Houghton's "Acme" dark slide and changing box. The slide division itself contains all the plates or films intended to be used, and which may easily consist of twelve plates or twenty-four films, each one being contained in a thin metal carrier, which, after exposure, is pulled by means of a small rod with a flat hook into the attached changing box, and the operation repeated till all are exposed.

A silver print fixed entirely by liquor ammonia instead of hypo was laid upon the table by Mr. Bow, who promised to speak upon the subject at the next ordinary meeting.

A number of large photographs of the Grand Observatory now being erected at Nice were exhibited by Professor C. Piazz Smyth.

Correspondence.

Correspondents should never write on both sides of the paper.

EXHIBITING AND EXHIBITORS.

To the EDITORS.

GENTLEMEN,—I regret that my health would not allow me to be present when my paper on *Exhibiting and Exhibitors* was read at the Photographic Society of Great Britain. Perhaps you will allow me to comment on so much of the discussion as you report and needs a reply.

Captain Abney refers to an incident in ancient history—my first introduction to him. It is so long ago now as to make us very old friends, and perhaps to dim the accuracy of the memory of both of us; but as it affords an illustration confirming what I mention in the paper of the awkwardness of too many cooks, perhaps I may be excused for giving my impression of an incident which has otherwise only a personal interest.

On one occasion when I was helping to hang the pictures, I had arranged the frames for one side of the room much to my satisfaction, and went away for an hour. On my return I found a stranger, who had not appeared before the work was half done, altering my arrangements. The stranger was Captain Abney, and I think I told him rather freely that he was interfering with the part of the work I had undertaken. From that moment commenced an unbroken friendship I have always highly valued, and which is one of the many pleasures I owe to photography.

It is rather awkward to publish a discussion on a paper before the paper is printed. In my case it gives Mr. Debenham an opportunity of ingeniously suggesting that I endeavoured to insult a foreign exhibitor.

Foreign exhibitors know better than Mr. Debenham does that I always welcome their exhibits; indeed, I should be very ungrateful if I did not, for they receive mine with great cordiality. In the present instance I speak, in the paper, of this foreign exhibitor's work in the very highest terms, deploring only that the mounts, which the photographer probably never saw, were so vulgar in taste as to greatly damage the pictures as well as the general effect of the exhibition.

Mr. Debenham objects to my saying that the mounts were vulgar in taste on the ground that it was a matter of taste. As my paper was chiefly on matters of taste, I think I may be allowed to agree with everybody of taste except Mr. Debenham, that the mounts were vulgar. I am sorry to be compelled to agree with most people in disagreeing on this subject with Mr. Debenham.—I am, yours, &c., H. P. ROBINSON.
Tunbridge Wells, March 12, 1887.

AN IMAGINED DANGER FROM AMMONIA.

To the EDITORS.

GENTLEMEN,—Early last summer I took up photography as an amusement, using Trafalgar and Iford dry plates, which require amongst other chemicals for their developing ammonia. In the latter end of August I was attacked with most violent ophthalmia, never having had it before (although I must admit my eyelids have often been weak, especially in the summer). I was at a loss to find the cause, and it was rather naturally suggested to have been brought on by photography, probably from the fumes arising from the ammonia during developing. As I only just escaped from losing my eyesight I am very chary about taking to the work again, bitterly as I regret having to give up such a fascinating study.

In the first place, however, I should like to know whether photography really had anything to do with it, and in the next, provided it had, is there no means of taking thorough precautions against the danger? Could I use another developer? or if that could not be done advantageously, would the wearing of protecting spectacles be sufficient guard for the eyes?

I should be very interested to know if this affection is ever met with among the profession, and what steps are taken in cases of attacks.—I am, yours, &c., E. Y. E.

Lower Sydenham, March 14, 1887.

[Although we have never heard of ammonia acting in the manner described, yet it is not impossible it may have been the cause of the ophthalmia in this case. If so, then our correspondent may take comfort in knowing that the carbonates of potash or soda will render him independent of ammonia.—EDS.]

RETOUCHING.

To the EDITORS.

GENTLEMEN,—In last week's JOURNAL your correspondent "Hydra" puts a question which, I must confess, is not an over-easy one to answer. He says, "I should like to ask Mr. Barrett what he considers a fair day's work. Doing the negatives well, and working, say, from nine a.m. to six p.m., with an hour off?" I will try to give a satisfactory answer.

There are some photographers (and good ones, too) who would not consider twenty-four hours a-day (Sundays included) to be at all too much during the busy months, and so obviate the necessity of working at all (at the photographer's expense) during the slack season. But thank Providence—I speak feelingly—these examples are few. For a good retoucher, one who is quick and works hard while he is at it, personally, I consider ten o'clock quite early enough to begin, and he should be able to get finished by about half-past five p.m. Retouching has always come rather easily to me, so I made up my mind on reading "Hydra's" letter not to give my individual opinion as an authoritative measurement of a day's work, but conferring with a few fellow-workers on the matter, have come to the conclusion that one dozen of mixed negatives—that is to say, about three or four large heads (ordinary cabinet vignettes) and the rest cabinet three-quarters and full-lengths—may be considered a fair day's work, this supposing the negatives of a fair average quality. It is possible to get cabinet heads that two hours would be necessary to make them presentable. I knew a first-rate retoucher (a Russian) who considered six cabinet vignettes a good day's work. But really so much depends upon the quality of the negatives that it is almost impossible to give more than a suggestion as to what may be considered a fair day's work in this branch.—I am, yours, &c., REDMOND BARRETT.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, March 23, will be *Outdoor Outfits*.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting of this Society will take place on Tuesday next, March 22, at eight p.m., at the Gallery, 5A, Pall Mall East, when the subject of *Bromide Prints* will be brought forward for consideration.

Exchange Column.

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

Will exchange telescope, marine glass, and box of fairy bells, for a Ross' $8\frac{1}{2} \times 6\frac{1}{2}$ portable symmetrical lens or wide-angle rectilinear, same size.—Address, J. H. GORMAN, Fore-street, Dulverton.

Gentleman's eighteen-carat gold keyless English lever, demi-hunter, three-ounce cases, by first-class maker; exchange for photographic goods.—Address, PHOTOGRAPHER, 4, John-street, Bradford.

Half-plate mahogany bellows camera, swing back, repeating back, and extra back for cabinets; also Marion's embossing press for cartes. Exchange for cabinet lens, head-rests, good interior background, or useful accessories.—Address, BARTLETT, 49, Dudley-street, Bilston, Staffordshire.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

A. M. F.—We would give preference to the "rapid," which will nearly cover the larger size.

G. G.—We have not tried No. 1 on your list, but we can speak well of No. 2 from personal knowledge.

C. A. H.—Such a studio as you speak of is preferred by many. There is certainly no objection to ground-glass.

R. A. CORNELL.—Coignet's gold medal gelatine is not suitable for making gelatine reliefs for the Woodbury process.

T. EDGE.—The work on platinotype is published by Messrs. Harrison & Sons, 59, Pall Mall, W. The price is two shillings.

AMOURETTE.—See reply in the last number. A solution of protosulphate of iron will precipitate any gold that may be in the solution.

O. P. H.—We gave our authority for the formula, but we have not tried it ourselves. If you cannot get on with it try bookbinders' paste; that will very likely answer your purpose.

S. WEISS.—1. We are not acquainted with either of the two productions mentioned, but have no doubt that both are reliable.—2. Diluted ammonium sulphide is the best reagent.

LENS.—Any lens bearing the name you mention is certain to be good; but it is assumed to be genuine, and not a forgery. A "rapid" lens of sixteen inches focus or rather more will serve the purpose.

S. A. WALLIS.—We do not imagine that you will gain any advantage by employing orthochromatic plates in photographing a tabby cat. If puss were a tortoiseshell some advantage might possibly accrue.

INQUIRER (Hainstead).—The print enclosed is taken from an etched plate—probably produced by a modification of Fox Talbot's original process. Such plates are now being produced commercially under various names.

A. B. Z.—Most if not all of the scientific works published on the Continent may be obtained through Messrs. Trübner & Co. Other foreign booksellers will also procure them if they are furnished with the titles and the names and addresses of the publishers.

G. Y. G. inquires where the English translation of the work by Captain Pizzighelli and Baron A. Hubl on the platinotype, alluded to in No. 1398 by Mr. W. H. Harrison, can be got or by whom published.—The English edition of the work in question is published by Messrs. Harrison & Sons, 59, Pall Mall.

GREENHORNE.—In the reply to your previous query there was a printer's error. If in place of *servid* you will read *serviced* the answer will be plain enough. If it is not, and you will send us the lenses, we will help you further. Classes such as you desire are held at the Polytechnic Institution under the direction of Mr. Howard Farmer.

SCOTUS.—1. If light gains access to the lens otherwise than through the aperture in the shutter it will of course affect the plate.—2. There is nothing against the shutter whatever if it works well.—3. Whether or not the developer mentioned is the best that can be used for under-exposed plates depends very much upon the make of the plate.

H. J. GONFIS informs us, in reply to Mr. Barrett, that Mr. G. Croughton, now in America, was never employed as a retoucher, or in any other capacity, by the late T. R. Williams; but he says "the managing partner, W. Mayland, engaged him after Mr. Williams was practically out of the business, and this in my personal knowledge happened a considerable time after retouching came into general use."

JUBILEE asks: "Can you assist me in a solution to the following little difficulty? I am using a double albumenised paper with a very high surface, but, do what I will, I cannot get the silver from the washings to precipitate. Whether I use a preliminary wash of alkali or plain water the result is the same, and if you can suggest a way out of the difficulty I shall be very pleased, as the time has hardly arrived when I can afford to throw silver down the sink. The paper is a ready-sensitised one."—If hydrochloric acid be employed in place of salt the precipitate will usually subside very quickly. The best plan is to add the acid and then stir the liquid vigorously for a few minutes.

B. P. writes: "Will you kindly inform me, through the medium of your paper, as to what materials I should use, and mode of applying them to linen, to form a plain distemper background?"—Distemper is made by mixing dry colour of the tint desired with water and common size, such as that sold by the oilmen. It is applied with a large brush, usually a white-wash brush. Only sufficient size should be used to prevent the colour from rubbing off when dry. The exact quantity can easily be ascertained by one or two trials.

STOREY says: "I have prepared a sensitising bath (silver) according to the formula recommended by Mr. V. Blanchard, in April, 1879. The paper works very well, but I find that the bath is turning quite brown. Can you advise me what to do with it? and do these baths usually turn yellow?"—Silver baths employed for sensitising albumenised paper usually becomes discoloured after a time. They can be decolourised by shaking them up with a little kaolin, when they will become as new. The works mentioned are not supplied by us. They may be procured through any of the dealers in photographic materials.

SAPPO says: "I have been trying to make some chloride of gold by Mr. Forrest's formula. I dissolved a nine-carat gold pin, about forty grains, and the result is a light green liquid. How can I get the colour out of it? or is it detrimental in toning?"—Mr. Forrest recommends the use of the current coin, which is twenty-two-carat fine, consequently the small quantity of alloy—two carats—does no harm. But our correspondent has used a metal containing thirteen parts of alloy—probably copper and zinc. Possibly this amount of base metal will do no harm, but that can be ascertained by toning some prints with it. As the amount of fine gold in the pin was but fifteen grains to begin with, it will not pay to devote the necessary time and trouble to the purification of the solution.

W. B. CASSINOHAM writes: "Will you please to inform me, in your 'Answers to Correspondents' column, if there is anything injurious in plain water for washing prints (albumenised) before toning, or would there be any advantage in using softened water (Maignen's anti-calcaire powder) as advertised? I use grooved troughs for my plates; they hold about four pints of solution each. I seldom have more than a dozen plates to do at a time. Is it necessary to throw the solutions away after using once only? Can they be kept for a week or two until the next batch of plates are ready, or is it best to make up fresh each time?"—It is not a good plan to use old fixing solutions. Hypo-sulphite of soda and alum are cheap enough, so it is better to use them fresh or not more than two or three days old. The stains on many negatives are caused by the use of old and sulphurised fixing solutions.

W. H. NEWTON writes: "I should esteem it a favour if you will inform me, in this week's JOURNAL, the cause of the spots on the enclosed prints. They are first to be seen after fixing; could they therefore be due to improper immersion on first being put in the hypo bath? In some cases the prints were dark and were left after fixing for the ordinary length of time in a very weak solution of hypo all night, to reduce them. Those marked on the backs with x were thus treated. Would small particles of verdigris from corroded taps be likely to cause them?"—The spots are due to sulphurisation, in all probability through air-bubbles adhering to the prints when they are first put into the fixing bath. We do not think they arise from particles coming from the tap. It is certainly a very bad plan to leave prints soaking in a dilution of hypo for a long time. The sooner our correspondent abandons this system the better.

FLOREAT RUGBEA says: "Would you kindly inform me, through your column devoted to 'Answers to Correspondents,' 1. Whether a magic lantern with five-inch condensers would be sufficiently large to enlarge from 5×4 negatives?—2. Are any of the enlarging papers at present in the market capable of receiving the tone and appearance of an ordinary silver paper?—3. Is there any method of removing from negatives without injuring the film the plain collodion used as a substitute for varnish?—4. Why am I often troubled with my varnish drying with a matt ground-glass surface? This obstructs the passage of the light and has forced me to discontinue using varnish."—In reply: 1. No. To enlarge from a 5×4 negative, if the whole is to be evenly illuminated, a condenser of not less than six and a half inches will be required.—2. Gelatino-bromide paper yields a colder tone than ordinary albumenised paper.—3. The collodion may be dissolved off without injury to the negative by immersing the plate in a mixture of equal parts of ether and alcohol.—4. Probably the varnish has been applied before the film was thoroughly dry, or may be the plate was not made sufficiently warm before its application. Either would account for the matt surface.

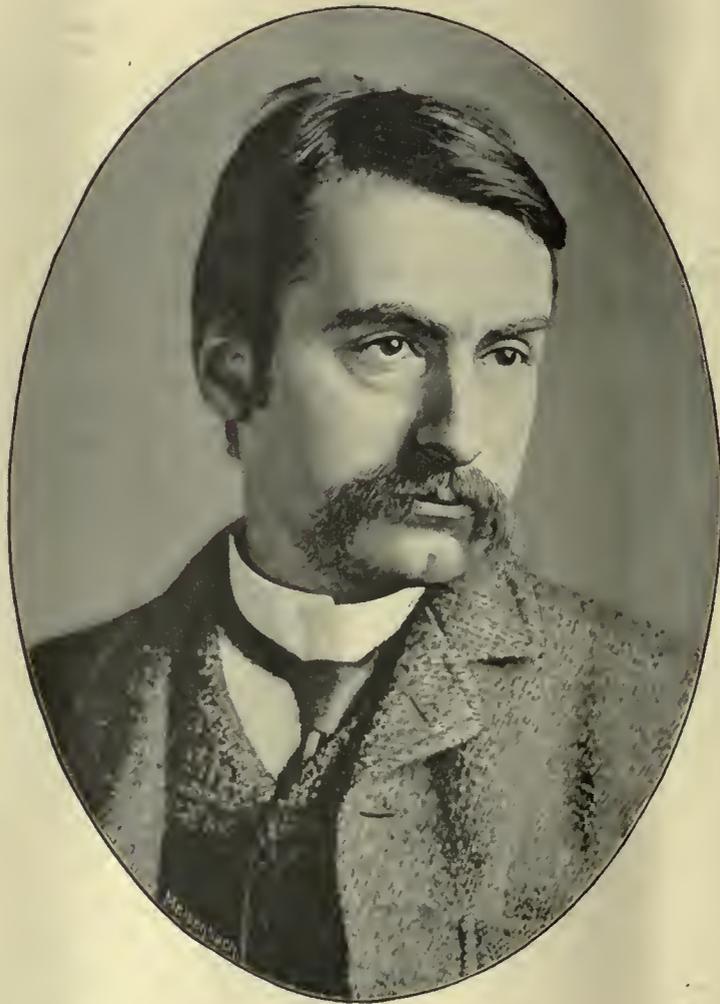
The catalogue of the Nottingham Photographic Exhibition is before us. It contains a large and varied collection, embracing a good deal of what was shown at the last London Exhibition.

An old member of the Photographic Society informs us, *apropos* of what we wrote last week concerning microscopic writing, that in the Jurors' Report of the International Exhibition of 1862 is a statement which on inferior authority would scarcely be credited, namely that the name and address of Mr. Matthew Marshall, Bank of England, has been written in the two-million-five-hundred-thousandth of an inch. If so then the whole Bible and Testament might be placed twenty-two times on the surface of a square inch.

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W. K. BURTON, C.E.

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SODA AND POTASH DEVELOPERS.

THERE can be little doubt regarding the growing popularity, especially among amateurs, of the addition of the carbonates of the fixed alkalis in preference to caustic ammonia to the pyrogallic developer, and in the course of the many conversations we have had with both amateurs and professionals, we have found that the constant nature of the former bodies, quite as much as the effects produced by their aid, has led to the abandonment of ammonia by so many workers—experienced hands as well as tyros. That the use of ammonia leads to grave uncertainty of practice has been irrefragably demonstrated. From the moment when, of very doubtful approach to the typical .880 specific gravity, it is purchased from the retailer, down to the time of being placed in the dish of developer, it is liable to continual fluctuations of strength, and consequent apparent irregularity of action, while the carbonates of soda or potash once purchased and kept with ordinary care are always supposed to be reliable.

Our present purpose is to show that there is in everyday practice the possibility of considerable error and irregularity in the use of these “constant” salts, a possibility brought about not by a single cause alone, and that the amount of error could be such as might easily exceed the extremest vagaries of ammonia.

At the outset, when we consider that these salts are, practically, only coming, and not come, into use, there is every opportunity for uncertainty from the actual names alone of these substances. Let us take, first, carbonate of soda. In America, which may be fairly termed the home of the soda and potash developers, the soda employed is recommended under the name of sal. soda. That is very good as far as it goes, for we are all told that it means “carbonate of soda”—nothing could be simpler. Let us look into the matter a little and investigate this simplicity. A photographer has heard from friends, and has seen in his journal, that carbonate of soda makes a splendid developer instead of ammonia, and upon the first opportunity he, determining to give it a good trial, sends his “boy” to the nearest chemist or, possibly, to the stores, or even to a grocer, for “an ounce of carbonate of soda.” We undertake to say that in nineteen cases out of twenty he will be served with a white amorphous powder without a question being asked. He dissolves it in water and makes up a developer according to the formula he has had given him, or will find in his ALMANAC. The result will be very different indeed from what he would obtain if he procured the crystals of carbonate of soda. The real truth is that the carbonate of soda in crystals is the material intended to be used by the compounder of the formula; but the familiar white powder is so universally known under the name of “carbonate of soda,” nice technical distinctions being ignored

by the general public, that unless it is actually understood by the experimenter that this confusion exists, the non-chemical reader would as an actual matter of course use the wrong material. Some would-be chemists glibly speak of sodium carbonate, and others again of sesquicarbonate or of bicarbonate, the truth being that the former term is too general and the latter older-fashioned and incorrect modes of speaking of what we may term this domestic chemical. There are three sodium carbonates, and to any one of the three is the term carbonate justly applicable.

The salt intended to be used is simply a pure sample of the familiar washing soda (of which more anon). It should be purchased at the chemists—preferably in the form of crystals—and asked for under the name of pure carbonate of soda in crystals. It is called by the technical chemists “neutral,” or “disodic carbonate,” and is found in commerce in the form of clear crystals. It also is to be obtained from the druggist as a dry white powder, the name under which they so know it being “exsiccated carbonate of soda,” here again being a fruitful source of uncertainty. Our own opinion is that this latter is the name which should appear in formulæ. There would be little or no chance of confusion, and the product would be, if pure, always uniform, a quality not to be lightly disregarded when we point out that the crystals recognised by the Pharmacopœia contain sixty-three per cent. of water of crystallisation, that is to say, ten molecules; while it is quite possible to cause the salt to crystallise also with fifteen, nine, seven, and indeed with only a single molecule. We thus see that, both popularly and chemically, carbonate of soda, even if we limit the term to include the neutral carbonate only, is liable to extreme fluctuations of strength, and that a soda developer may not have a fair trial unless these conditions are understood.

Many photographers (if we remember aright, this was the case with the first publication of the formulæ) employ simple washing soda. We do not say it will not answer, but we do say that, if employed, extreme irregularity may be expected, for these crystals are very crude and impure, and may contain sulphates and chlorides in large quantity. These may possibly be non-injurious; but, if present in some and not in other samples, unequal results must be anticipated, both on the grounds of varying strength through the impurities and the possible restraining or other action they may possess.

It will now be fully evident to our readers, that if confusion is to be avoided and regularity be secured, some different and definite understanding must exist, or some other designation be employed. Our own recommendation would be that the “exsiccated carbonate of soda” of the Pharma-

copœia should be the substance selected; it is, perhaps, the most likely body to be procured at the chemists, and might be depended upon for evenness of composition and purity.

Turning now to the fellow carbonate, the carbonate of potash, we may admit that this chemical being so much less in demand has not a confusing popular name, and that if carbonate of potash were asked for at the chemists and druggists there would be little probability of confusion of terms as with soda. But we must point out that the one particular salt intended has no more right to the sole use of the term than has the soda compound, for there are two carbonates of potash or potassic carbonates (the latter being no more exact an appellation than sodic carbonate). The carbonate to be used is the normal or dipotassic carbonate, and is sometimes called subcarbonate of potash, also salts of tartar, and, more rarely, salts of wormwood. It is far less used in medicine than the acid potassium carbonate, or hydrogen and potassium carbonate, which is prescribed by the physician, and sold by the chemist as "bicarbonate" of potash.

But we must point out that this carbonate of potash is by no means an article of unvarying purity, so that, though in a less degree, our remarks upon soda crystals will apply to it. From all points of view, the carbonate of potash seems likely to become a greater favourite than that of soda.

We need not dwell further upon the topic; we trust we have shown, not only the possibility of confusion and irregularity, but also the need for a recognised exact nomenclature in formulæ for soda or potash developers.

COLOUR SENSITISING OR COLOURED SCREENS?

FURTHER experiments were made in which, instead of employing the coloured screen, the chart was illuminated by means of light passed through media of various shades of orange or yellow. The first of these trials, even when orthochromatic plates were employed, were so utterly devoid of any special colour effects that we were for some time at a loss to account for the result; we succeeded, however, at last in developing a theory, in explaining which we may be excused for going somewhat minutely into the details of our arrangements.

The colour chart in all our experiments was affixed to a screen placed at right angles with and close to a window, in a large apartment lit by other windows, the nearest of which is some fifteen feet away and so situated that no direct light from it could fall upon the chart. The walls, however, of the room being practically white, reflect a considerable amount of light on to the object over and above that which falls directly upon it from the window in close proximity. In the experiments with coloured media, this window was covered over with coloured tissues of various shades, from the so-called golden fabric to deep orange or even red paper. With the first-named material the colour was so light that to the eye little, if any, modification of the chart was apparent, and scarcely any variation of exposure was needful. But with the darker tints of orange and red the visual character of the chart was entirely changed; the yellows were entirely lost, and at a short distance not even the outline served to pick them out from the white ground. The various shades of orange appeared many degrees lighter—as yellows, in fact—and bright vermilion alone seemed to retain its original character amongst that class of tints. The blues, especially the brighter ones, much to our surprise, retained almost their pristine appearance, but the greens were changed slightly in the direction of blue.

With these *visible* changes of colour it seemed to us that there was a very strong hope, even with ordinary plates, of securing a marked modification in the rendering of at least the yellows. Our surprise may therefore be imagined when we found that when using the colour-sensitive plates the results given were precisely those obtained without the screen and with white light. The only effect of the coloured media was to necessitate a longer exposure; but, however much the exposure might be varied, there was no difference in the colour rendering. It is scarcely needful to say that with ordinary plates the case was precisely similar, except that the exposure was still further prolonged, though proportionately to that required by the orthochromatic plates not so much as we should have anticipated.

After repeated attempts to alter the results, all of which proved unsuccessful, we were naturally led to ponder the matter. Orthochromatic results, we were aware, are alleged to have been obtained not only in this manner but even with reflected coloured light. Why then, in our trials, were the results entirely negative? After some consideration it occurred to us that possibly the reflected white light falling upon the colour chart from the walls of the apartment might have some action in vitiating the orthochromatic influence of the coloured media. We therefore constructed a rough framework, by means of which the colour chart was entirely enclosed within screens of the same coloured material. The visual effect upon the different shades and tints of colour varied in no respect from that already described when the preponderance of illumination fell in one direction only from the coloured window, but the photographic effect upon the sensitive films was widely altered.

With ordinary plates there was still not the faintest sign of orthochromatic effect, but the exposure necessary when employing the same medium was very greatly increased as compared with that requisite under the former conditions. With the orthochromatic plates, however, while the exposure was but comparatively slightly lengthened, the resulting image possessed all the characteristics of those obtained when using the coloured screen in front of, or behind, the lens, thus demonstrating unmistakably the correctness of our suspicion with regard to the action of the reflected white light.

But the importance of the observation is in connection with its bearing upon the theory of the use of the coloured screen, and enables us, we think, to explain why, without colour-sensitised films, the screen proves practically useless, at any rate with a chart composed of artificial colours.

As was suggested by Mr. A. L. Henderson some little time ago, the proper way to test the orthochromatic value of films is to photograph the spectrum. So far as the orthochromatic *principle* is concerned this is undoubtedly true, but it would be far from an accurate guide to the practical application of orthochromatic plates to the reproduction of pictures. In the spectrum we have to deal with pure colours; pure, that is, not only in the sense that they are simple and not compound colours made from a mixture of other tints, but pure, also, inasmuch as they are not diluted or modified by an admixture of white light. Thus the blue of the spectrum is blue and not blue with an addition of white, and consequently it behaves as blue. In using a yellow screen for the purpose of photographing the spectrum, we are really photographing the absorption spectrum of that particular screen, and if it should cut off the blue rays entirely then even on an ordinary plate the blue will, being entirely absent, be rendered as black, while the particular rays which are freely passed by the screen, yellow for instance, will

have their active power proportionally exalted, and so be rendered with a nearer approach to white.

But the case is entirely different when a colour chart or a picture is photographed. We have then not only to deal with the colour, *qua* colour, but also with a more important item—the reflected white light. It has been stated, and no doubt correctly, that in photographing natural objects a far greater proportion of the photographic action is performed by the white reflected light than by the coloured objects themselves. In the case of copying coloured pictures, the case might be considered to be different, and no doubt would be if the pigments employed were pure spectrum colours, for setting aside the light inevitably reflected equally from the surface of the picture, we should have to deal more directly with the colours themselves than with reflections caused mainly by the forms of natural objects.

That reflected white light is the more important factor in photographic action, even with pure colours, is open to easy demonstration. If the sun be allowed to fall upon a prism and the spectrum intercepted upon a sheet of white paper be photographed either with or without a yellow screen, we get no more orthochromatic effect upon an ordinary plate than would be obtained from an artificial colour chart; though, if the same spectrum be allowed to fall *directly* upon the film itself we have, by the intervention of a coloured screen and without colour sensitising, all the effect that can be obtained with both.

If we accept the fact then that the greater part of photographic action is due to reflected light irrespective of colour, it is not difficult to understand why with ordinary plates the colour screen should, in the majority of instances, prove quite ineffectual; nor is it indeed difficult to see how, under some circumstances, the reverse may be the case. The effect of white light is so much more powerful than that proceeding from the mere colour, that the latter is practically masked, as shown in the first series of experiments recorded above. Here, though under the action of the coloured rays, a modification of the chart visible to the eye occurred, still the visually more feeble reflected white light quite overpowered it; when, however, the object was illuminated by coloured light only, the respective action of the blues and yellows may be considered as self-dependent, and the former being relatively more actinic than the latter was able to hold its own in spite of the unfavourable conditions of lighting.

It was remarked recently by Mr. W. E. Debenham, that a film rendered more sensitive to yellow would be at the same time rendered more sensitive generally, but especially to white light. This is quite our own view; but taking the converse, a film rendered less sensitive to blue rays by the interposition of a yellow screen will be rendered proportionately less sensitive to yellow as well. Therefore, in using a coloured screen, if any orthochromatic effect is to be gained, it can only be by chemically increasing the sensitiveness of the film to yellow rays in order that the retarding action of the screen may be counteracted.

We had a most favourable opportunity, a few weeks ago, of testing the orthochromatic method ascribed to M. D'Haow. The time was within half an hour of sunset in the latter part of February, and the sun lay low on the horizon undimmed by any cloud and of a deep red colour, surely conforming perfectly to the requirements of M. D'Haow's method, namely, comparative absence of blue or actinic rays. Three exposures were made of 30, 60, and 120 seconds, five seconds being the normal exposure required for an ordinary plate at midday. The result

was, in each case, but especially in the two shorter exposures, that the yellows and oranges suffered rather than otherwise in the rendering.

It is seldom that photographers, at least those dwelling in the neighbourhood of the Metropolis, have had within a few days of the vernal equinox such an opportunity of photographing snow scenes as they have this year. The heavy fall of last week furnished some excellent subjects for the camera, but, unfortunately, many of the results obtained which have come under our notice have been marred, and in some cases completely ruined as pictures, through over exposure. In some of the photographs in the brighter parts, which should have been represented by sparkling lights, there was decided indications of a reversed action. It should be borne in mind that, at the present time, the light, although the sun may not be visible, is of a much more actinic character than it was a few weeks back. The heat of the sun, coupled with a cold atmosphere, has produced some curious effects on the snow. In some places on one side of the road, where it has been sheltered from the direct rays of the sun, may be seen a thick coating of snow while the other is perfectly free. The same effects are seen where the snow has been shaded by trees. Photographs taken under these conditions are curious and interesting, though they may not be considered artistic.

Apropos of snow pictures, how should the snow be portrayed? In a painting it is always represented as being much whiter than the sky. In a photograph it is almost invariably rendered darker. Which is right? Visually, the snow usually looks much whiter than the sky, however bright that may appear.

On several occasions, in our back volumes, we have directed attention to the subject of ceramic photography, and pointed out the pecuniary advantage that would probably accrue to those who would make a feature of it in their ordinary business. We are not here alluding to small work 'on enamelled copper,' but to larger sizes on porcelain. But so far as we are aware very little has been done in this direction by the profession. However, the matter now appears to have been taken up commercially, not by photographers, but by the dealers in earthenware and china goods. In a china shop at the West End, the other day, we saw some specimens of portraits burnt in on porcelain plaques, together with the announcement that enlarged copies from any photographers were supplied. The examples shown were exceedingly good, so far as the ceramic part of the process was concerned—the tones were deep and rich, and the colour pleasing; but the photographic portion of it was by no means satisfactory. The portraits had been enlarged, probably three or four diameters, from paper prints, and showed the grain to a painful extent. Even from paper prints, had they been judiciously lighted in the copying and skillfully retouched, much better results might have been obtained. Had the original negatives been employed, which would have been the case had the photographer executed the work, the results would be widely different. Successful ceramic photography is as much dependent upon the photographers' work as upon the potters.

THOSE who are in search of subjects for instantaneous photography should pay a visit to the different metropolitan markets during their business hours. Those who have only visited the London markets during the daytime have no conception of the animated and picturesque scenes to be witnessed in the early morning. Covent Garden, Farringdon, or Billingsgate Markets, present a widely different appearance at midday to what they do at five or six o'clock in the morning. A series of instantaneous photographs of such subjects would illustrate phases of London which would be exceedingly novel to a vast majority of the public. Of course, to secure these pictures, early rising, and a good light, are essential. The period is now fast approaching when the light will be sufficiently good to enable instantaneous effects to be obtained at a very early hour. In spring and early summer the atmosphere is usually clearer in London during the morning than it is later on in the day.

Now that the actinic quality of the light is so rapidly improving, those who employ natural instead of artificial light to develop by will do well to examine their dark room windows. The light coming through a window may be so non-actinic that it will not affect the most sensitive plate during the winter months and those of early spring, but not so as the summer advances. Here is a case in point. Foggy plates were frequently met with of late in a certain establishment, which, for some time, could not be accounted for, till at last the dark room window was suspected. This, upon testing, was found to be the cause. The window had been prepared, over two years ago, by covering a square of pale yellow glass with several layers of thin orange and red paper which then answered admirably. When the paper was removed the other day it was found that the action of light during the two summers had caused the sheets next the glass to fade considerably. The first one had most of its yellow discharged, and the second was but little better. Before a batch of plates are condemned for fog at this season of the year, it will be well, if daylight be used, to examine the dark room windows. We have, before now, heard of instances where yellow glass has changed colour through the continued action of the sun's rays.

TREES when they are devoid of foliage are rarely objects of interest, pictorially, to the photographer. But not so to the arborist. From a series of good photographs of trees, taken without their leaves, the student in arboriculture may acquire more knowledge than by almost any amount of reading. When trees are covered with foliage the fantastic forms of the branches of some, and the peculiarity of the bark of others, cannot, of course, be seen to advantage. This, therefore, is an excellent time to secure the photographs. The light is now good, and it will be a month or more before the trees put on their summer garments. In the Royal Gardens at Kew are to be found almost all kinds of trees, and every facility for photographing them will be given by the Comptroller. Application for tickets should be made in writing, and addressed to him at the Gardens.

DR. ROYSTON PIGOTT bears remarkable testimony as to the photographic power of microscopic objectives made with the new optical glass. He describes certain ruled gratings, made by Nobert, of such extreme closeness of ruling that the latter despaired of ever being able to see them in the microscope, and the exact number of certain of which rulings he kept secret. Dr. Royston Pigott says that Colonel Woodward sent him beautiful photographs of these bands, but the counting of the lines was precarious and bad, owing to diffraction lines being so plentiful. In old photographs of diatoms the same defect greatly marred the beauty of the pictures. But lately Dr. Van Heurck has sent him photographs taken with several new lenses, and those produced by combinations of the new glasses were so finely executed that the counting of the lines can be at last accurately performed. In these photographs, even when examined with a one-inch glass, "traces of diffraction are scarcely visible, and in many regions (speaking now of photographs of *Amphipleura pellucida*) altogether absent."

It is well known that the rough-and-ready hydrometer method of ascertaining the strength of silver baths is rejected by some of the more scientific manufacturers of ready sensitised paper for the more accurate plan of precipitation. We believe, however, that the Mohr system of using chromate of potash as an indicator to give, by a permanent change of colour in the precipitate, the point when complete decomposition has taken place is less generally adopted, though it is employed by some. It is, perhaps, as well that its employment should fall into desuetude, for, according to Mr. R. F. Carpenter (writing in the *Journal of the Society of Chemical Industry*), freshly precipitated chromate of silver is dissolved in solutions of alkaline nitrates. The writer considers there is here a complete explanation of the fact pointed out by a previous writer that the precipitation of the red chromate often takes place too late when nitrates, especially those of the alkalis and alkaline earths, are present. As it is evident that in well used silver baths there must always be present a large proportion of these nitrates, the photographic bearing of the observation is obvious.

PERMANENCE OF ARGENTIC BROMIDE PRINTS.

THE question of permanence of prints is still before the public, though it has turned into another channel from that which it originally took, and it now seems to be the turn of platinotype to be attacked vigorously with the essence of rotten eggs.

Last October I had an article on this subject, of which this is a continuation. We then started some experiments, which we have brought to a conclusion, only, as usual, to suggest something else. The preparation of the prints which we experimented with will be found in the issue of 1st October, 1886, and I do not think it will be necessary to recapitulate here.

In an article of 8th October, Mr. Pringle took exception to the fixing of the prints. In regard to this we had taken the precaution of placing about twenty-eight square inches of unexposed paper in the fixing bath, passing them through all the subsequent operations to the finishing of the prints; this we treated in the same way we had before treated the gelatine films scraped off glass, and got just the faintest trace of silver. I hope this will satisfy Mr. Pringle that the prints were fixed.

The prints were then cut up into three parts, one of which was put away, another into a test-tube having a solution of the gas to which it was to be subjected at the foot, and placed in a window having a west exposure, and getting the full benefit of the afternoon sun (when there was any), and the third was placed in a tube in the same way, and placed in a drawer so as to keep it in the dark.

No. I. was subjected to chlorine water, and, as we supposed, entirely disappeared in about twelve hours, having been converted into chloride of silver, which was proved by the image returning again by exposure to light to a certain extent.

No. II. was subjected to nitrous fumes, produced by acting on copper with nitric acid, and went entirely in about two hours.

No. III. was subjected to sulphuretted hydrogen, and on the third day was observed to have got a very slight tinge of yellow in the whites, which was more marked in the one exposed to light. It also seemed to be very slightly bleached. All the prints were under treatment for twelve weeks, except Nos. I. and II., which were destroyed, as above stated, at the end of that time. No. III., that part in the light, was very slightly yellow, in the whites was faded slightly, and of a very much richer colour. That part in the dark was also yellowed and slightly faded, but of not nearly so rich a colour as the part in the light.

No. IV. was subjected to ammonia, and on the second day was observed to have become slightly yellow, and also bleached, that part in the light being only slightly bleached, and the part in the dark markedly so. When they were taken out after the twelve weeks they were both much damaged; the gelatine seemed to have been slightly decomposed, and the whole thing was very tender. I may add that the films Nos. III. and IV., both in the window and the drawer, periodically got knocked over, and therefore the print was kept not only in a continuously saturated atmosphere, but also in a continually soaking condition. The result was that there was a certain amount of difficulty in getting them out of the test-tubes, and they most decidedly look like it.

I may mention that both the sulphurated hydrogen and the ammonia had been freshly prepared with every precaution, and the distilled water used in analysis, and which may be taken to contain little or no impurities, such as iron, &c.

No. V. was placed in sulphurous acid, and as there was none of known quality in the laboratory some was made, and the parts of the print sealed up in tubes filled with the gas as it came from the last wash bottle, and therefore saturated with moisture. There seems to be no change in this print after the twelve weeks; if changed at all it is, I think, very slightly bleached.

No. VI. was acted on by coal gas, and it was placed in a tube which was made a junction between two india-rubber tubes, which led the gas to a Bunsen which was in constant use in the laboratory, and therefore had a constant stream of gas passing over it, and which, at the end of about the four months, was unchanged.

These are the facts, and readers may draw their own conclusions from them. To me they appear very favourable to argentic bromide paper. In all instances it behaved in the way I should have expected it, except in its behaviour under ammonia.

The accepted theory of the developed image is that it is metallic

silver. In No. I. this is borne out by the silver when acted on by free chlorine, which even platinum cannot stand, was converted into the chloride, which is white, and which darkens by exposure to light.

Case No. II., nitrous fumes also converted the silver into the colourless nitrate; No. III., V., and VI., sulphide of silver being black, or dark brown, I was not surprised at the print taking a warmer tone.

The only case I am unable to explain is No. IV., where the print was acted on by ammonia, and the only way I can account for it is that the ammonia decomposed the gelatine to a certain extent, so altering the porous film with which the silver was surrounded that the change of colour was not due to a change of composition but to a molecular change in the silver itself. The yellowing in the high lights also leads me to think that I was correct in thinking that there is in an emulsion besides the haloid of silver, there is also formed a certain organic compound of silver and gelatine, which is insoluble in a solution of thiosulphate of soda, and it is this compound which also produces the yellowing when the prints are acted on by sulphurated hydrogen.

Another point with regard to the Eastman bromide paper which surprised me the other day was its extreme insolubility. I wanted some of the reduced silver for examination, and to get it exposed two pieces 1/2-plate size to light and developed and fixed in the usual way, only omitting the alum bath. To get the film freed from the paper I thought I would treat the sheet with boiling water. To my disgust (at the time) I found it had not the desired effect, and I had to scrape off the film with a spatula, and it was not until I had boiled it about a quarter of an hour that the scrapings seemed in any way to lose their form.

II. J. GIFFORD.

ORTHO-, ISO-CHROMATIC.

THE terms *iso-* and *ortho-*chromatic are rapidly becoming a part of our language. Would it not be worth while to stop for a moment and ask the question, Do they really mean what we generally suppose they do? I presume that by those words we mean the quality of rendering colours in the correct—*i.e.*, proportional—order of luminosity.

Turning to my Greek Lexicon, I find,—(1), *Orthos* (adjective), straight; Latin, *rectus*, upright—metaphorically, right, safe, prosperous, upright, just; as an adverb, rightly, correctly, really, truly. (2), *Isos* (adjective), equal to, like, level; (adverb), equally. (3), *Chroma* (*a*), surface of the body; (*b*), colour (especially of skin—*i.e.*, complexion); (*c*), metaphorically, ornaments, embellishments; (*d*), technical term in Greek music, a modification of the diatonic scale.

Turning now to my English Dictionary, I find these words used variously in composition,—*e.g.*, (1), Orthodoxy, sound faith; orthography, correct spelling; orthopterus, straight-winged, &c. (2), Isothermal, equal temperature; isomorphic, same form; *isochromatic*, having the same colour.

Now with regard to *chroma* in composition, I do not find any which come under the meanings of (*a*) and (*c*); one under (*d*), namely, chromatic scale, a musical term; and under (*b*) we have many, namely, achromic, free from colour; isochromic, see above; polychromatic, many coloured, &c. From all of which I think we may safely draw the following conclusions, namely, (1), That *ortho* and *iso* neither in the Greek nor English use bear the meaning of *proportional* or *relative*; (2), That *chroma*, when used in this sense, is distinctly *colour*, and not *luminosity*.

Therefore *iso-* or *ortho-chromatic* do not mean proportional or correct luminosity.

Turning once more to my Greek Lexicon, I find *kairos*, due measure, right proportion; but with regard to luminosity, the idea seems to be distributed amongst several words, *e.g.*, *phaos*, daylight; *euphegges*, clear bright light; and *lanprotes*, brilliancy. I therefore venture to propose *kairo-lanprotic* as being something nearer the meaning than *ortho-* or *iso-chromatic*.

It may be said, Why have a new word when we all know what the old terms are supposed to mean? So far as *isochromatic* is concerned, we find the Dictionary has already assigned it a meaning very far removed from that which it is generally supposed to mean; and regarding *orthochromatic*, it is simply misleading, and if left must be the cause of confusion hereafter. Therefore I say by all means let us try, so far as we can, to call things by their proper names.

I fully agree with the author (whose name I forget) who said, "Words are the tools of thought, and the best tools will yield the best work; therefore call things properly and you will the more easily think correctly."

We have quite a sufficient number of misnomers in our daily use to free us from any anxiety lest the curiosities of that class will shortly become obsolete.

FRED. C. LAMBERT, M.A.

ACCESSORIES OF THE LANTERN.

CHAPTER IV.—LINEN SCREENS.

LINEN screens are, for occasional exhibitions, the most convenient, as they are easily stretched and take up little space during travelling; when soiled, they are more easily cleaned than any other kind, as it is only necessary to wash them. They do not reflect quite so much light as a newly whitewashed surface, but the difference is not very great if the linen is quite clean and well bleached.

When choosing material for a linen screen, that should be selected that is the closest in the mesh and the most opaque. All light which passes through the screen is not only wasted, but also tends to fog the picture on the screen, being reflected from the wall behind the sheet. For screens larger than ten feet square, it will be necessary to join two widths together. In making a fifteen feet screen, a five-foot width may be sewn to a ten-foot width; the screen will then have a seam right across it five feet from one edge. When this screen is stretched for an exhibition, care should be taken that this edge is put at the bottom; the horizontal seam will then be hidden to some extent by the broken foregrounds of the pictures.

The effect of the joining is that of a white line across the disc; this is caused by the doubling of the linen, the light that passes through the first thickness (and which would be lost in other parts of the screen) being reflected back again from the second thickness, thus giving enhanced light where the seam is. This white line shows very prominently when it crosses a sky tint. It can be lessened by making the folded part very narrow, or the linen may be put simply edge to edge, as in carpet stitch.

It is a bad plan to sew a strong web or tape round the edges of the screen. The web often does not stretch as much as the linen, and then it is necessary to apply great force to get the screen free from creases. A screen should have the edges simply hemmed. At the corners a few inches of webbing may be sewn on so as to form an eyelet or loop—this will prevent the screen tearing when being stretched; also small eyelet holes, strengthened with a little webbing, may be inserted in the borders of the screen at intervals of two feet or so. I do not admire a fringe of white tapes all round a screen; they give an untidy appearance, especially when a few of them are missing from their places, they being very apt to be pulled off.

In order to avoid too frequent washing of the screen, one side should be kept clean; and as dirt must sometimes come in contact with the screen, owing to dusty walls, curtains, &c., not to speak of laying the screen on the platform boards, the dirt should always touch the side of the sheet that does not face the audience. This is easily managed by always folding the clean, or front side, *inwards*, after every exhibition. When letting down a large screen, the lower part should be drawn forwards to prevent the face of the screen touching the floor; when re-erecting the screen, the inner side (as it has been folded) should again face the lantern. By adopting this simple system, a great saving in trouble and laundry bills will result. In order to further protect the linen against dirt, it is a good plan to have a strip of calico, four feet broad and as long as the screen is wide; this calico should be spread on the floor, and the linen laid upon it when raising or lowering the screen. The calico is also useful to wrap the screen in.

The stretching of a linen screen is usually done by ropes or cords, with the aid of a wood frame of some kind. Some lecturers who constantly travel with the lantern content themselves with ropes alone, and do not carry any supporters. With the aid of ladders they drive large nails into the side walls, to the great detriment of the plaster, and hang the screen on these by ropes. But sometimes they come to a hall which has, perhaps, been newly decorated, and they are forbidden to put any screw or nail into either the walls or the ceiling, and sometimes even the floor is prohibited. As the person

who gives this information usually sits down and watches to see that these rules are not broken, they are then in a quandary, and have to call in the aid of a carpenter to arrange some support for the screen. Now, joiner's work is expensive. I once knew a master joiner commissioned to fix up a twenty-three feet screen in a large hall; the man made a day's work of the job for himself and two or three of his men, and charged 30s. for it. He did the work well, there was no denying, but he got no more commissions of that kind. Those who had engaged him contrived to stretch the screen themselves in future exhibitions.

Screen poles are, in my opinion, well worth the slight increase they cause in the amount of luggage carried. With these, a screen can be fixed up in any hall, without interfering with the walls or ceiling, and, if necessary, a couple of half-hundredweights can be made to do duty for screws in the floor. They save a good deal of trouble in doing away with the use of borrowed ladders, which are generally of a rickety and uncertain character, and either too short or too long. Imagine a gentlemanly operator, unused to feats of balancing, mounting to the top step of a wobbling ladder and leaning his person against the whitewashed wall to prevent himself falling over backwards, which gradually gives him the look of a miller; then he has to ferret out some joint under the plaster to drive his nail into, and after operating over a square yard of wall surface and detaching a quantity of plaster which falls into his eyes, he comes to the conclusion that the wall is composed of one solid block of stone without a joint; so he descends, hot and perspiring, and finds several people who have been watching him engaged in an heroic attempt to appear unconscious of the mirth that is consuming them within. Experience of this kind ruffles a man's temper, and renders him unfit, if he has to lecture, to do so with any approach to affability.

Frames are sold at some opticians, which form a complete square the size of the screen. They are well suited for small sizes, such as ten feet and under, but for large screens of fifteen or eighteen feet, a square frame would be too heavy and cumbersome. The horizontal rod at the top of the screen requires very strong side pieces to bear the weight; hence I think that top and bottom pieces should be omitted, and only side pieces used. These should be of course jointed. They may consist of laths three inches wide and one and a quarter inches thick, with bolt holes at intervals of six inches apart the whole length; a pair of ten-foot laths like these can be bolted to any height up to nineteen feet. Four of these will suffice for a fifteen or eighteen feet screen. I prefer, however, to use shorter pieces, about four and a half feet long and one and a half inches diameter, with pieces of brass tubing fixed on; these will join together like a fishing rod. The top piece may be thinner than the others, and should have a ring at the summit. Eight such rods will form two strong uprights, capable of supporting an eighteen feet screen, which is large enough for most halls. If necessary, the uprights can be further raised by standing them on chairs; if the hall is low, the height of the uprights can be diminished by omitting one of the rods from each. These rods are much lighter and more portable than the laths. When travelling they may be strapped together as a small bundle.

In answer to inquiries as to where white paper of considerable width, suitable for small screens, can be obtained, I may say that Messrs. Winsor & Newton, of London, supply cheap "cartoon" paper, sixty inches wide, at 1s. the yard. A similar paper of the same width and price, called "wide cartridge," is sold by Messrs. Goodall & Suddick, stationers, Leeds. A six-foot screen may be made by joining a strip thirteen inches wide on the bottom of the five-foot width, as a join in paper does not show so prominently as in linen. These paper screens are not very durable, and many will prefer to use a hand-made drawing-paper five feet five inches and six feet six inches wide, which is sold at 4d. per square foot by the Leeds firm. This paper is mounted on brown holland, and is of course much less likely to tear than the cheaper kind.

ALBERT WM. SCOTT.

ON THE USE OF THE STEREOSCOPE AND ITS SCIENTIFIC APPLICATION.

1.

THE accession of so much new blood to the photographic ranks ought, one would think, to give a fresh impetus to the use of this beautiful, but now almost obsolete, instrument, for there must be large numbers

now whose acquaintance with it is extremely slight, and to whom a study of its powers would be as a new revelation. With this hope, and the idea that an occasional paper may keep the thing green and act as a stimulus to some reader who may favour me with his attention, and because I wish to suggest a new sphere for its use, I venture to return to this old crotchet of mine and pen the few following remarks.

It is now generally recognised that the principal cause of the rapid decline of the instrument, in the estimation of the public, arose from the deluge of rubbish in the shape of articles called stereoscopes and slides which flooded the market. This badness of quality, combined with an absence of the slight cultivation necessary on the part of purchasers for fully appreciating the beauties of binocular vision, caused the reaction, which has resulted in the articles in question becoming old curiosities instead of contributing to the amusements and pleasures of home as during a somewhat short period in the past generation. If amateurs would but take the matter up in a hearty manner the question of lack of cultivation need scarcely arise, for each would be likely to make sure that his slides were viewed in suitable instruments to the best advantage, and take care to impress his friends in respect of how and what to observe. I should be sorry to see the matter gone into for purposes of commercial speculation, for I have an impression that the instrument even when good is a trifle beyond the general public, and therefore if it became again common it would only be as a sort of fashion to be followed by mere imitators, which would pass away and leave the feeling usual to things of so fleeting a nature.

Some years ago I had exceptional facilities for ascertaining what power people were possessed of, and of judging by their remarks and conversation what they expected to see and what they really saw. The firm who employed me had a large stand located in a prominent position in the Crystal Palace for a number of years. This was constructed to carry twenty-four stereoscopes fitted with whole achromatic lenses of about one and three-quarter inches in diameter and six inches focus, of Dallmeyer's best make. The instruments and slides were arranged as perfectly as it was possible at that time to make them, and as everything for exhibition purposes must be fixed and unalterable, the details of focus, width between centres of lenses, and corresponding width between the centres of each half composing a stereoscopic slide, were calculated for nominal sight. Each instrument was what a popular one should be. Its value as an attraction more than equalled anything in the building, for peep-holes will cause any one, rich or poor, small or great, philosopher or fool, to gravitate to such mysterious places, eager to know what is on the other side, so there was no lack of subjects for study. Besides the stand, there was a stall with an assortment of instruments consisting of good, bad, and indifferent specimens of the combined arts of the optician, cabinet-maker, and tinman, the work of the first-named in many instances ceasing, I suspect, after he had parcelled up the lenses in dozens or by the gross to be sent to members of the latter handicrafts to select and fit up into the finished article. The collection here fairly represented that of a London stock house, and afforded opportunities for judging of the effect of a bad instrument on an intelligent person.

Of the observers, a large proportion might be at once dismissed, because they could see better with one eye the expedients adopted to ensure to them the full enjoyment; for their supposed advantage of single vision were sometimes amusing, covering the eye with the hand, the corner of a shawl or pocket-handkerchief, being quite as frequent as squinting, which did not appear as common as might have been expected. Many proclaimed the visit to be their first acquaintance with this kind of thing by peering into the second eye-piece, and expressing some dissatisfaction because it was the same. This obtuseness, I believe, was not due to any instrumental defect or of sight, but purely to want of power to see anything more of the third dimension of an object than was apparent from its light and shade, no other illusion being looked for; the mind probably failed to perceive this, and would require a remedy, a little cultivation by such means as would be found in dissimilar pictures of simple geometrical figures, in which the simple idea of solidity would be produced without other complications, being more suitable. Many others saw double, a sort of after-dining-out vision. This undoubtedly pointed to unsuitability of instrument slides, the lenses or pictures being mounted too wide apart for such persons to make the two halves of the slide coalesce

without considerable strain and discomfort. A few of this class may swell the ranks of the one eye observers, but others of more intelligence would probably consider it an inherent defect of the stereoscope, and have nothing further to do with it. Another class, smaller in number, found it necessary to wipe up the lenses or to rub their eyes. They could not see the pictures clearly, probably because the lenses were not quite suited to their somewhat abnormal vision. As we used the interior of the stand as a room, one was able to note the remarks of the sightseers, and these bore out the conclusions drawn from observations made outside, namely, that a very large percentage of the visitors were not quite comfortable, or had the power to appreciate what was before them. If with the good stereoscopes of the stand so many failed to see aright, one may feel assured matters were not improved at the stall adjoining. Here the things were made to sell, and were got up more pretentiously. Elegant brasswork, open tops of splendid designs, choice veneers, and French polish, were the most prominent qualities, and very tasteful and pleasing some were in respect of exterior. Had their optical arrangements only been equal to this external get-up, there would have been less to find fault with, but it was just in this most important detail that so many failed.

In going through a consignment I have frequently found considerably more than half of the instruments possessed of some defect in this respect, especially in the class having prismatic lenses in small eye-pieces. It was not at all uncommon to find these mounted with their thick edges together, or obliquely to one another, which would be a fatal defect to any one not understanding the principles of the thing, it being quite impossible to see anything but double in them. The commoner forms, with large unachromatised prismatic lenses, were far preferable and more fit for popular use than the more expensive sorts. With the better class of English make the case was different. They were not turned out in shoals like the foreign ones and other common kinds, but were fitted up intelligently and well. Had their price been less, they might have saved the reputation of the stereoscope and prevented it from being cast aside.

In respect to the slides, I do not believe they were much to blame, their prevailing faults being but minor ones, and such as would scarcely add to the difficulty of perceiving stereoscopic effect without strain or discomfort if viewed in a good instrument. The principal were those of mounting the pictures too far apart, and of cutting both halves alike, instead of showing more subject in each half at the edges which come together in the centre than the corresponding edges of each at the outside. When they are both cut alike, the rather unpleasant appearance of the picture showing in front of the mount becomes visible. Cutting them unsymmetrically prevents this, and does not curtail the size of picture, and if a distance of two and three-quarter or two and seven-eighth inches be fixed upon as the amount of separation between two corresponding points in the foreground of either half of the slide, and both pictures be mounted truly parallel to one another, there will be no cause to blame the slide if double vision result.

The difficulties of getting negatives for the purpose under the present circumstances of easy photography being but slight compared with those of the old collodion days, the amateur has a fine field before him. Subjects are now possible that could only be dreamt of then, and I feel persuaded that any gentleman who devotes himself to this branch of photography, and prints his negatives as transparencies, will derive more pleasure from it than if he were to confine himself to paper work, unless this were of large size; and as the printing processes are so numerous, and capable of producing a great variety of effects, it is possible to represent nature in nearly all its aspects. The rendering of texture, surface, and lustre, as we see it, can only be done by binocular pictures, a single one being nowhere in comparison. Let any one who questions this statement make a stereoscopic photograph of a glass of water, or a piece of plate, print a transparency, and study it in and out of the stereoscope. He will need no further argument, but will admit that sheen and lustre, as represented by single specimens of paper work, are dull and spiritless to a degree he never imagined. The negatives produced for the one purpose would be quite as serviceable either for lantern work or enlargement, so his practice could be diversified with either of these at will.

As the plea for the use of the stereoscope as a scientific instrument will make this article too long, it will perhaps be better to break off here and leave its discussion to another paper. JOHN HAMMER.

THE EDUCATION OF THE CHILDREN OF PHOTOGRAPHERS.

THAT a public controversy should ever have arisen dealing with the relative positions of amateur and professional photographers, seems to me much to be deplored; before it began we were all jogging along pleasantly together, and questions tending to promote differences had better have been left untouched. Amateur and professional photographers are living facts, neither can abolish the other, nor should have any desire so to do; such a feat being impracticable, it was unfortunate for all of us to see the unnecessary introduction of a new discord, tending to create a division of forces where all should pull together. Bitter and unjustifiable words were uttered by exceptional individuals on both sides of the controversy, and each side seemed to think it had some inherent superiority over the other, but was unable to give evidence thereof. Suppose a man to be an amateur photographer, and nothing else, giving time to the subject only now and then, he ought to be sorry if his idle pastime does injury to any professional photographer leading a more noble and honourable life, that is to say, industriously doing steady work for the world day by day, and having a moral right to existence because he regularly gives to society an equivalent therefor in duties performed. A man who goes down to his grave after a life during which he has received ten or a hundred more benefits from the world than he has given to the world in return is a sorry spectacle; it would have been better for human kind had he never been born. What right has he to consider himself the equal of one who does his duty in life, and whose existence is a benefit to the community? In examining this question from another point of view, let us take the case of an exceptional photographer with no soul above that of the love of the most contemptible of vices—the love of making money; I mean a man who makes no new researches nor any attempt at self-cultivation, but who lives the life of a vegetable, following the dull routine of the trade he was taught in his youth, and getting angry when the work of some amateur in his neighbourhood interferes a little with the flow of pollard into his trough. All the practical advantages are on the side of the professional photographer; he is at the work from one year's end to another, yet if an amateur can step in and beat him upon his own ground by a more refined taste and a greater love of science, such a professional deserves to suffer, assuming amateurs to injure commercial photographers as proved by a broad view of the facts rather than by a few isolated examples. The popularity of music and singing, and the great number of amateurs connected therewith, do not seem to injure professionals; the amateurs widen and keep alive the interest in the subject. The same may be said in relation to professional and amateur artists with the brush. It is a difficult question, no doubt, but I have carefully watched the influence upon the profession at large of the action of some of my personal friends as amateur photographers; in the course of two years they spent about one hundred pounds in dabbling in the subject—had their likenesses taken by several leading professionals to see how they arranged sitters, and so on, then grew tired of the pastime and dropped it. Had they not turned amateur photographers they probably would not have spent five pounds among photographers and photographic dealers in the same time.

As Dr. Vogel says, only those photographers who are unable to do work of sufficiently high quality are likely to be injured by the amateur. One class of such inefficient photographers I think deserves sympathy; there may be a man who loves his work, and improves it and himself as much as he can, yet is unable to compete in quality of work with the amateur when the latter chances to have a more cultured taste and a higher education. Education is, at the present day, what a spear is to a savage; it is a weapon of offence and defence in the fight for ascendancy in life, and, just as among savages, conquerors disarm captive populations, so, in more civilised communities, do educated persons who live for selfish purposes desire to keep the many ignorant to use them for their own ends. In a workshop the best-informed man inevitably gets an ascendancy over his companions in labour, and so is it with larger communities; the best educated nation in the world will become the most powerful nation in the world, assuming all other conditions to be equal. Hence I say that it is hard upon a professional photographer, who has tried to improve himself to the best of his ability, if he is accidentally commercially injured by the work of an amateur who had started under more favourable conditions in life, and the best plan for the photographer is to take care that his own children shall start better armed than he himself was in the social battle. It is better to give the children a first-rate education than any amount of money. There is no more painful object in creation than the son of a man who has had but one object in life—that of making wealth by exacting all he can from his neighbours. The son has some of the unpleasant hereditary

characteristics; he is above the necessity of making himself an industrious shopkeeper like his father; he thinks that his money will carry him into refined society in which such a snob would be unbearable, and is astonished to find that cultured people with no wealth at all cannot help holding him in contempt; he will not associate with his own kind, so no course is open to him but to jog along steadily to the Devil; we have all seen him on the journey.

The best thing then that a father can do for his children is to give them a good education, including one or more of the fine arts, and to start them in life with a store of mental resources of which no earthly power can deprive them. Here comes the most practical part of my sermon. Great Britain is notorious on the Continent as being, with Spain, one of the most uneducated countries in Europe. Education here is the privilege of the very few, and almost absent among the many. A great outcry is made against the expense of the trifling beginnings of education forthcoming in Board schools; what would such objectors say about Switzerland, in which country one-third of the whole national revenue is spent upon education? In our own country the expenditure is but five per cent. of the total national revenue. The fact is, that upon an average a much better education than in England can be obtained nearly everywhere upon the Continent, and at perhaps half the cost, so I would recommend photographers to send their children abroad to get that education which they cannot obtain at home, unless at comparatively very expensive rates; this plan is extensively adopted by persons of limited means in English society.

Once, in mooted ideas like these to a photographer, he responded, "Well, where do you advise me to send my son, not too far from London, and where the people speak French?" There are plenty of first-rate schools in Paris and Brussels, more or less used by the English, but there are parents who prefer quieter localities. Boulogne-sur-Mer, so very close to England, is not a desirable place; it is half Anglicised, and one might almost as well settle in Brighton. Calais is flat and uninteresting, but at Guines, a few miles out, near the Field of the Cloth of Gold, are some schools much patronised by the English. Altogether, I think Ghent about the best place near London to which to send boys and girls to be educated; sometimes English families settle there for a few years with no other object than that of enabling their children to get a first-rate education at small expense when compared with English charges.

Ghent prides itself upon its educational position, and claims that its free schools "have a European reputation." They were founded as early as 1828, at which time three of them were established, but in 1837 their number was increased to eight, in consequence of the intelligence and generosity of the Burgomaster, M. Joseph Van Crombrugge, one of the most far-sighted men in Europe in his day, and whose name is now venerated in Ghent. At the present time there are a great number of schools of all classes in Ghent, and the city is richly dotted with the fine public buildings devoted to scholastic purposes, including some for giving thoroughly practical education in the arts and sciences. The Municipality of Ghent now expends upon its public schools about £40,000 a-year, scarcely any of which goes to pay rent, since, on the Continent, very much to the welfare of its inhabitants, scarcely a public building of any value can be found erected upon another man's land; houses and the land they stand upon are usually sold together, and I was told in Ghent that probably the whole of the cotton and other factories in the city are built upon what we call freehold land; any fabricator who did otherwise might be looked upon by his friends as a lunatic. Ghent is quickly and comfortably reached from London or the north of England *via* Harwich and Antwerp; in fact, the comfort and the moderate rates for dining and passage on board the Great Eastern Railway Company's steamers are beginning to be recognised by the frequenters of the more expensive and exclusive routes to the Continent. The steamers pass the terminus of the little local line from Antwerp to Ghent, half a mile before they land the passengers at about ten o'clock in the morning in the former city, so the visitor has but to go a little way back along the quay, where the railway steamboat conveys him to the other side of the Scheldt, and in an hour or two he is in Ghent, the chief seat of the cotton spinning industry of Belgium. He might go by one of the large State railways from Antwerp, but that route is a long way round.

My idea is that the photographer of to-day should train up his children to be able to better compete than himself with the amateur in photography or in any other profession, by sending them abroad to receive an education they cannot obtain on equally moderate terms and with equal fulness at home. The large numbers of young men and women leaving Continental universities and technical and other schools to do their work in the world, can, of course, compete with the English with success, and deserve so to do, because they have

gained the power by their own industry and by the enlightenment of the governments under which they live. Hence orthochromatic photography comes from abroad, and the photographing of the pictures in the National Gallery and Windsor Castle falls into the hands of a foreign firm; also, photo-mechanical printing has attained a perfection unknown here, as proved by the specimens exhibited to the Photographic Society of Great Britain by Mr. Warnerke. As regards technical education, I would recommend that the children of photographers be taught the art of painting and the sciences of chemistry and optics; art education should take precedence, because the photographer who has it not is but an intellectual mechanic, and can never occupy the highest positions in the profession hereafter, for the cultured section of society is beginning to clearly distinguish between those photographers who are artists and those who are not such. The young photographer, armed for the battle of life as herein suggested, should irradiate his educational acquirements with the fire of genius, and be able to seize each occasion as it presents itself; for instance, when Captain Abney acted upon his magnificent idea of nominating a variety of corpses to serve on the Council of the Photographic Society of Great Britain, the young fledgeling of a photographer should have arranged his models with prophetic instinct, and given us an ideal photograph of the Council of the future, with a jolly old corpse in the chair, keeping order by hammering the table with a thigh bone. No sensitive soul should feel grieved at my use of the word "jolly," although some inartistic person has begun to murder the good old song—

"For he's a jelly good fellow,"

by altering it to—as sung at the Glaisher testimonial dinner—

"For he's a hearty good fellow,"

thereby taking real heartiness out of the expression, and mutilating time-honoured tradition. The mutilator must have been a sentimental hairdresser or head footman, who knew where to draw the line in points of refinement, or he may have been the publisher who received from a celebrated literary man the following couplet in a book for children—

"There was an old woman as ugly as sin,
Who lived upon lucifer-matches and gin."

The publisher struck out these lines as unsuited for his highly-refined taste and customers, and, without permission, substituted something of his own, utterly vapid and uninteresting. He was no doubt astonished when the *Athenæum* newspaper fell upon him hotly for his impertinent vulgar refinement. W. H. HARRISON.

PHOTOGRAPHY IN THE FIELD.

[A Communication to the Photographic Society of Chicago.]

As our Society includes both professional and amateur photographers, and as there is a general idea that the professional takes but little interest in landscape work, a paper on photography in the field may be, by some of you, considered a mistake, as applying only to one section of the Society.

It will be readily admitted that there are few trades or professions that are more exhausting, both mentally and physically, than that of a fully employed portrait photographer, and no one needs more than he an occasional period of relaxation and recreation or change of employment. Now it will be evident that if that necessary change of occupation can be in any way made conducive to the improvement of the photographer's ability as an artist, his period of relaxation will be a double gain. I have, in my time, tried many methods of making "happy holiday," and in company with almost all classes and conditions of men, including many hard-wrought professional photographers, and believe that the pleasures and advantages of all the others put together do not equal those derived from the judicious practice of photography in the field, or landscape photography.

Mr. Enoch Root, in a recent number of the *Philadelphia Photographer*, says: "The constant routine of the studio is not favourable to art progress," a statement that I think a little too strong, but I heartily endorse the recommendation which he founds on it. "Therefore let the gallery artist shake off, from time to time, the daily cares, and go forth to outdoor nature with his camera, and enjoy the pleasures of an amateur in the true sense of that much misused term. From such an excursion the participant will return refreshed in mind and inspired by nature's charms to an incentive for the production of better work, in the no less artistic but less fascinating field of portraiture."

Landscape photography, then, ought to be equally interesting to the professional and the amateur, and as the processes and appliances by which it is carried on have reached a degree of perfection not even dreamed of little more than a dozen years ago, there is hardly any excuse to be made for the man who makes a photograph but not a picture.

To those who have but recently joined the ranks, a slight sketch of what photography in the field implied a quarter of a century ago may not be without interest, and as a personal reminiscence of one of the

periodical (generally weekly) trips of the Edinburgh Photographic Society may be taken as a type of the average of such outings, I give it as it presents itself to my mind at the present time.

It was a Saturday morning, early in the sixties, and about the time the corn was in the ear. I don't, of course, mean maize, to which that name seems to be universally applied on this side, but oats, which the great Dr. Johnson characterised as "in Scotland food for men, and in England food for horses," an observation which elicited, doubtless from some observing Scotchman, the reply: "And where will you find such men, and where such horses?" I reached the railway station with a cab load, consisting of the following items:—a 11 × 9 brass-bound camera, weighing twenty-one pounds, and meant to last for all time: it is now over thirty years old, and is, or was two years ago, as good as ever. A water-tight glass bath, in wooden case, holding over ninety ounces of solution, and weighing twelve pounds; a plate box with a dozen 11 × 9 plates, weighing almost as many pounds; a box 24 × 18 × 12 inches, into which were packed lenses, chemicals, and all the hundred and one articles necessary for a hard day's work, and weighing something like twenty-eight pounds. The advent of folding tripods had not come, at least folding tripods that were rigid enough for such large cameras, and so I had perforce to encumber myself with one that, when closed, looked like an alpine stock, over five feet in length and much thicker than my wrist. It weighed about five pounds. Lastly, there was the tent. Of those I have had various forms and kinds; my favourite was known as "Smart's," a beautiful arrangement of angled spars, covered with heavy black cloth, that made a most convenient dark room, about 10 × 40 inches, and 6½ feet high, with ample table accommodation; the whole packed into a leather case, like a long roll of bacon, and weighed over forty pounds. I was soon joined by a dozen or so of others, similarly equipped, although in some cases with heavier loads, and in due time we started for our destination, Armiston, some twelve or fifteen miles from the city. With a load of about 120 pounds, even although shared by an unlucky friend who had been impressed into the service, and, of course, promised copies of all the pictures that should turn out well, we did not care to walk far, and, of course, where the tents were set up, there or thereabout the whole work of the day had to be done.

Now, if you will bear in mind that after a suitable spot had been selected, tent pitched, water supply secured, and everything ready for work, the real anxiety of the day began. The bath was in good working order last night, but how will it be to-day? Baths were often the most obstinate and contrary creatures in existence, and seemed to take especial delight in taking the sulks just when they ought to have been on their best behaviour; while collodion, as if recognising the fact of its importance, was as contumacious as an Irish pig, and uncertain as—well, as Chicago weather. The production of a sensitive surface with material so uncertain in its action was, certainly, not conducive to that frame of mind so necessary in the communing with nature, to wile her into putting herself into her most artistic aspect; and as the surface, once prepared, had to be used within a few minutes thereafter, there was no time to wait for the disappearance of a scowl caused by a passing cloud, and she had to be taken as she was rather than as she ought to have been.

By-and-by, thanks to Tapenout, Hill Norris, Fothergill, Major Russell, and many others, who showed us how to prepare a dry plate that would be always ready when wanted, our labours were lightened, and the possibilities for good and comfortable work vastly extended; but the long exposures, that varied from fifteen minutes to almost any length of time, including, on one occasion, from a Saturday afternoon to a Monday morning, in the case of an interior of the old Antiquarian Museum of Edinburgh, rendered such pictures as are now most frequently produced and most generally admired, simply impossible.

If we contrast those days with the times in which our lines are cast, we will be able to realise how great is the gulf that is between them, and while congratulating ourselves on our more favoured position, will, I hope, not forget that to whom much is given of them much will be required. Under the older and less favoured circumstances, to aim at technical perfection was about all that could be expected of us, and we need hardly be ashamed to confess that when our photographs were picturesquely beautiful, as well as technically perfect, it was more owing to chance than good guidance.

Now, however, with apparatus of the most perfect construction, and plates or paper films as reliable as a sundial on a summer day, and both as light and of as little bulk as a preacher's valise on a Saturday to Monday visit, we are expected to reproduce nature, not exactly as she is, but as she ought to be; to, in fact, produce such pictures as shall for ever shut the mouths of those who deny to photography the right to rank as a fine art. But this cannot be done without systematic work, involving much careful forethought. In the first place, the very simplicity of the operations and perfection of appliances militates against the high standard that ought to be aimed at. In consequence of the convenience of double plate holders, or the even more convenient roll holder, the landscape photographer is tempted to take with him to the field a number of plates or films far in excess of what it is possible to convert into really artistic negatives during the few hours that are available of even the longest day for good work; and as plates and films are now so cheap, he is tempted to make exposures on subjects and under conditions that yield negatives that are hardly worth the trouble of development, and that are rarely subjected to the ordeal of printing. Half a dozen negatives that are both

technically and artistically satisfactory, are surely better than half a gross of such as are too frequently taken, simply because we dislike to bring home clean plates; but the good old couplet,

"He that fights and runs away will live to fight another day,"

ought to be kept in mind, and as both films and plates will keep, a new golden rule should be formulated and rigidly enforced: *Never make an exposure unless under conditions that offer a fair probability of producing a satisfactory picture.*

How are those conditions to be secured? Simply enough; never take your camera to unknown ground. Just as six perfect pictures are better than six dozen mere photographs, so are, as a rule, six negatives that have been prospected for on one day, and exposed on another, better than the same number that have been selected and exposed at the same time. My ideal of a photographic outing is one that shall occupy two days. On the first, the camera is left at the hotel or place of residence, and with a compass, a strong knife, a pretty long walking-stick with a crook at the end, and a supply of twine, I go over the ground in search of the picturesque. The ability to recognise material that has the making of a picture varies vastly in different individuals, but rapidly improves by cultivation. When a suitable subject is recognised, it should be examined from all possible points, with the view of selecting that from which the principal lines fall just where they should, and where the foreground will be satisfactory without interfering with the proper position of the horizon. Intervening branches may be cut down, or turned out of the way and tied up if necessary; and even scrub and brush may be created and made to wonderfully improve the composition by sticking branches into places where they seem to be required. Lastly, the all important point of shadows must be considered. The artist must decide as to where they will be most effective, and ascertain by the compass at what hour they will be there, and so be able to return on the following day and make the exposure without further trouble.

It is true that the true artist is a law unto himself, and no really high-class work is ever done by those who tie themselves down to hard-and-fast lines; but there are a few leading principles which even the greatest artist rarely if ever neglects, and the recollection of which will greatly help the inexperienced to secure at least tolerable results.

I have brought a few specimens of various classes of pictures, and if our friends at the lantern will light up and pass them through, we shall see the advantages and disadvantages of attending to, or neglecting those first principles.

Our first picture, as you see, is not a picture, but a sheet of clear glass with two lines crossing in the centre, and dividing the plate into four equal parts. Now the weak parts of a picture are those covered by the lines, and the weakest is just where they cross. Nothing of importance in a picture should be placed on those lines, and especially on the weakest part—where they cross. The strong points, that is the points on which the principal objects should fall, are below the horizontal line, and about one-third the distance to the right or left of the perpendicular line, and the points next in strength are corresponding places above the horizontal line.

The next picture is intended to illustrate the necessity of giving attention to the horizontal line. That line naturally is always on a level with the eye of the beholder, no matter at what elevation he may place himself, and in a picture, under ordinary circumstances, should be arranged so as to lie about one-third from the bottom, or where that is impossible, then about one-third from the top—never, under any circumstance, in the centre, or place of the horizontal line in our first illustration. Here we have a fairly well composed picture, in which the lines are properly balanced, and the bridge with the fishermen, which is the principal object of interest, just on one of the strong points. The horizon is, however, so much too high as to convey the idea that the river runs up a tolerably steep hill, instead of through a comparatively flat gorge in the landscape.

The next is a single yacht in full sail, technically a very fine photograph, but utterly absurd from the position of the horizon, and the consequent large foreground. The water is really represented as an inclined plane. If we now, by this card, cut off the foreground, we at once bring the yacht into its proper position, and by apparently lowering the horizon, the water at once appears as a level surface. This, our next picture, is a similar seascape, with a single yacht, also in full sail, but in this case the camera has been level; the horizon is exactly one-third from the bottom of the picture, and the composition is just as it ought to be.

Our next picture is copied from an engraving after a celebrated artist. The *object* is the old mill and cluster of houses in the strong point at the left of the centre line. The small clump of brush and stunted tree on the extreme left, may to some seem unimportant, but their value will be apparent if we cut them off by a slip of cardboard. You see the composition is now lopsided, and there is a feeling of instability in the trees on the right. Even the way in which the small tree is bent is important as repeating, but in an opposite direction, the lie of the larger mass on the opposite side, giving thereby a faint but sufficient indication of the favourite pyramidal form. Of course the artist of the brush and canvas has many advantages over his brother of the camera; but when the latter overcomes those drawbacks, and produces pictures in spite of them, he is surely entitled to all the more credit.

The rest of the pictures are intended as examples of both good and bad composition, but I shall not detain you by a lengthened description of each. Every picture should have a motive or principal object, and all the leading lines and lights and shades should be so arranged as to lead the eye to it. As a general rule, only one principal high light is admissible, and the shadows, or the heavier of them, should lead the eye out of the picture. It is also a matter of much importance that the picture, or that part of it which is visible, should be sufficiently far from complete to suggest much more than is actually seen.

But I fear I have already occupied too much of your time, and shall conclude with the advice which has been repeatedly given, as an aid to securing pictorial effect. It is to select a title for each picture before finally deciding on its composition, and I know from experience that where there is a good title to work up to, the pleasure will be greater and the work easier.

JOHN NICOL, PH.D.

DARK ROOM ILLUMINATION.

In a recent number of the *Bulletin*, the subject of dark room illumination was discussed. From some experiments made by the writer, he inferred that an erroneous statement was made, at the January meeting of the Photographic Society of Chicago, in relation to the Roche glass for dark rooms.

I believe all agree that a gelatine emulsion plate is least sensitive to the red rays. Hence any coloured medium which, when examined with a spectroscope, transmits other than red rays is unsafe; and as between two fabrics, transmitting an equal amount of light, the one which absorbs or intercepts everything except the red of the spectrum is greatly to be preferred. It has frequently been stated by both English and American writers, that because the eye is most sensitive to yellow, it is the kind of light to use for the dark room, the inference being that we see just as well with only a fraction of the red light necessary for the same purpose. Now, unless the relative actinic effect of the two kinds of light on an emulsion plate is taken into account, the argument is of no value whatever. Some months since I attempted to determine the relative sensitiveness of emulsion plates to yellow and red light, and for this purpose chose the cloth known respectively as cherry and golden medium. As the cloth was similar in texture, and differing only in colour, I presumed the same amount of light would pass through each, although for the purpose of the experiment this condition is not essential.

The source of light was a sperm candle, placed either in a lantern or outside my dark room window. The seeing qualities for the two kinds of material was ascertained by examining a negative by looking through it, and also by reading printed matter. For these particular specimens of cloth the ratio, determined from a number of experiments, was as one to four and a half in favour of the yellow. Fraunhofer found the maximum luminous intensity in the yellow about ten times as great as at the C line. Comparing the luminosity of the whole area covered by the red and yellow respectively, the resulting ratio would perhaps be reduced to one-half the maximum. In other words, using yellow light we can see with about one-fifth the amount of red light required for the same purpose.

A Cramer lightning plate was exposed in my sensitometer at one foot distance with the following results:—

Golden medium, equivalent exposure one second; cherry medium, equivalent exposure twenty-eight seconds. In other words, the plate was twenty-eight times more sensitive to the yellow light than to the red. Combining the two results, so that the ability to see should be the same for both red and yellow, the final ratio is one to six in favour of the red as a protection to the plate.

In the same experiments, deep red glass was also tried with the same plate, giving an equivalent exposure of one hundred and eighty-seven seconds. The time then required to fog, using a sperm candle at one foot distance, was for the three media respectively, as follows:—

Golden medium	1 second.
Cherry medium	28 seconds.
Deep red glass	187 "

The deep red glass which I use, when examined with a spectroscope, virtually cuts off all except the red. The cherry medium, on the contrary, lets through a large portion of the yellow and green, while the golden medium extends the spectrum still further.

The Roche glass lets through most of the yellow and green—in fact the spectrum is almost identical with that given by the cherry medium.

A good deal of the ordinary red glass used by photographers gives a spectrum similar to the cherry medium, and is of course unsafe. A specimen of this kind of red glass, however, when compared with the Roche, was found to transmit more than twelve times as much light as the latter. Hence the apparent protection Mr. Roche and others have obtained is due simply to a reduction of the light and not to any peculiar non-actinic properties possessed by the glass.

Having made a very large number of experiments with various kinds of glass, cloth, &c., I would recommend the deep red glass mentioned above. Such glass is upwards of one hundred and fifty times more effective with a given light than the yellow cloth, and is the best medium for dark room illumination of which I have any knowledge.

PROF. G. W. HOUGH.

—Anthony's Photographic Bulletin.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 3922.—“Improvements in Instantaneous Shutters.” J. R. GOTZ.—*Dated March 15, 1887.*

No. 3998.—“An Improved Apparatus for the Application of Electric Light for Photographic Purposes.” F. J. CHARY.—*Dated March 16, 1887.*

No. 4178.—“An Improved Construction of Rotary Album suitable for Photographs, Memoranda, and the like.” Complete specification. T. W. NAGINGTON and W. H. WAHNG.—*Dated March 19, 1887.*

PATENTS COMPLETED.

AN IMPROVED METHOD OF PRODUCING PRINTING SURFACES BY PHOTOGRAPHY.

No. 5205. EDWARD WILLIAM FOXLEE, 22, Goldsmith-road, Acton, W., Middlesex.—*April 14, 1886.*

My invention relates to that method of producing photographically engraved plates for intaglio printing, known as the “Waterhouse Process.” This process is described in *THE BRITISH JOURNAL OF PHOTOGRAPHY*, and in the *Photographic News* for November 26th, 1880. Briefly, it consists in producing a photographic image in gelatine on a silvered copperplate after the manner of carbon printing. Then, while the gelatine is still wet, it is dusted over with powdered glass, sand, emery, or other gritty material, which has previously been treated with wax, stearine, or other similar substance. After the gelatine is dry, the gritty particles, which have imbedded themselves in it, are removed by brushing or other mechanical means. The grained image thus obtained is then treated with plumbago and an electrolyte made from it. This electrolyte forms the printing plate from which impressions are obtained in the copperplate press. In practice it is found very difficult to remove the gritty matter without injuring the delicacy and sharpness of grain it has produced, and it is the crispness of this grain that gives the ink-holding property to the finished plate. Further, if any of the gritty particles remain in the gelatine, they destroy the evenness of the grain and interfere with the deposition of the copper in the electrotyping operation.

My invention consists of substituting for the powdered glass, sand, emery, or similar materials, which have to be removed mechanically, powdered resins, resinous gums, asphaltum, and analogous substances, which are insoluble in water but soluble in suitable menstrua, such as alcohol, ether, benzol, naphtha, turpentine, mineral oils, &c., according to the resins or resinous gums employed. In my improved method the grain-producing material is removed from the gelatine film by solution instead of by mechanical means, so that risk of injury to the grain by abrasion is avoided.

My invention is carried out as follows:—An image in pigmented gelatine, from a photographic negative, is developed upon a copperplate, either silvered or otherwise, by the usual process of carbon printing. After the print so obtained has dried, I sift over it a resin or resinous gum in a more or less fine state of division, according to the grain required, and then allow it to dry. The gelatine image may next be rendered insoluble by immersing it in a solution of alum, sulphate of alumina, or their analogues, and again dried, or the gelatine may be made insoluble by treating it, while still wet, and before applying the grain-forming material, with one of the alkaline bichromates, and, after drying, exposing it to the action of light. When the gelatine has been made insoluble the plate is immersed in a solvent of the resin or resinous gum employed. Thus, if sandarac be used, then I prefer alcohol as a solvent; if dammar or bitumen, benzol, and other resins or resinous gums, according to their solvents. After the resin has been dissolved the plate is further rinsed with the solvent and dried. The gelatine is then coated with plumbago and electrotyped in the ordinary manner.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—The use of resins, resinous gums, bitumen, and similar substances, which are insoluble in water, for producing a grain on the gelatine image, and afterwards removing them by solution, substantially as described, in place of the sand or other gritty matter hitherto used, and which has to be removed mechanically.

IMPROVEMENTS IN THE USE OF PARTIAL BALL AND SOCKET JOINTS FOR THE ADJUSTMENT OF PHOTOGRAPHIC CAMERAS ON THEIR LEGS OR STANDS.

No. 5626. CHARLES PUMPHREY, Regent Works, Herbert-road, Small Heath, Birmingham.—*April 24, 1886.*

ONE form is that of a hollow cup with rim or flange which is attached to the camera; the outside of the cup rests in a ring on the top of the stand. A circular plate inside the cup is the head of a screw, which by means of a nut secures it firmly in any position.

Another form is that a nearly complete sphere, is made part of the top of the stand, and this is grasped by means of one or two screws between two partial sockets, one of which need be only narrow, the other must be extended so as to be attached to the camera, and if that attachment is at an angle of about forty-five degrees the adjustment from horizontal to perpendicular is easy.

What I claim is:—1. The plan of using a hollow cup of the form of part of a hollow sphere, and grasping it between the inner and outer surfaces. 2. The use of such forms of annular or partial sockets as I have described or drawn to grasp a sphere which is attached to either a camera or in any position to the head of the stand.

AN IMPROVEMENT IN PHOTOGRAPHIC CAMERAS.

No. 6013. VERO CHARLES DRIFFIELD, Mount Pleasant, Appleton, Widnes, Lancashire.—*May 4, 1886.*

MY invention is applicable to such photographic cameras (generally known as detective cameras) as consist of two distinct but connected cameras fitted with lenses of equal focal length, and which I shall hereinafter call duplex cameras. One of these cameras is used for focussing the image, and the other for the exposure of the sensitive plate.

My improvement consists in the application to the focussing camera of a mirror set at a suitable angle, or of a reflecting prism whereby the image may be seen from above. The mirror or prism may be placed behind the usual vertical focussing screen, or a horizontal focussing screen may be employed if the mirror or prism is placed below the focussing screen.

By this improvement I enable the operator first to support the camera steadily against his body during exposure of the plate, and at the same time to see perfectly the object he is about to photograph, and secondly to secure pictures without attracting the attention of bystanders or of individuals who may be photographed.

What I claim is:—The application to duplex cameras of a plane reflector or mirror for the purpose of rendering the image visible through an aperture in the upper side of the camera, substantially as hereinbefore described.

IMPROVEMENTS IN PHOTOGRAPHIC CARRIERS AND APPARATUS RELATING THERETO.

No. 16,605. HENRY COPPIN, 39, Wood-street, London.—December 17, 1886. This invention has for its object to render photographic apparatus more portable and convenient than hitherto by reducing the bulk and weight thereof, and also to afford increased facilities for taking a series of views by providing ready means for using any number of plates with only a single back, thus combining efficiency, economy, and convenience.

To carry out my invention I make the frame of the camera back single, with a slot in the top through which to insert the carrier and plates, instead of double or book-like, or as a single frame wherein the carrier and plates are inserted on each side; and I furnish its two sides on their inner edges with grooved guides and grooves. These grooves are continued round the inner edge of the bottom of the frame, and serve to carry the ordinary hinged sliding panels, used for admitting or excluding the light, to or from the plates. A suitable opening is formed in the top of the frame through which to insert the carrier into the grooved guides.

Such carrier consists of a single frame of any suitable size and of sufficient thickness to take two plates instead of one only as heretofore. It is provided with the ordinary cross wires and buttons, which serve to secure the plates in position when placed therein.

By this improved construction of camera back any number of plates may be used with only a single back, while, owing to this and also to the carrier taking two plates instead of one only, numerous plates can be readily carried by the operator, thus greatly increasing its facilities for taking a series of views.

Another advantage of my invention is that the operator can readily change the plates in daylight by placing the top of the back in a light-tight bag fitted with an elastic nose or its equivalent, which serves to confine the mouth of the bag tightly round the frame of the back, and carefully inserting the carrier and plates therein or withdrawing them therefrom as required.

It is obvious, therefore, that owing to a single back being sufficient for any number of plates, and also to the convenience afforded by my improved double carrier in conjunction with the light-tight bag, the weight and bulk of the apparatus is considerably reduced, and increased convenience and economy are obtained.

My invention is readily applicable to existing camera backs, and to camera backs so made, by screwing or otherwise fastening the two frames together so as to form a single frame, and fitting the same with grooved guides so as to carry my improved double carriers in the manner hereinbefore described.

I make no claim either to the grooves, hinged sliding panels, cross wires, or buttons hereinbefore mentioned, save in combination with the other parts of my improved camera back and carrier, as similar devices have been employed for like purposes in the camera backs and carriers hitherto in use.

What I claim is:—1. Making a camera back with a single frame, substantially as hereinbefore described and shown. 2. Providing such frame with grooved guides, substantially as hereinbefore described and shown. 3. Making the carrier for photographic plates with a single frame and otherwise, as hereinbefore described and shown. 4. The improved construction of photographic camera back and carrier, substantially as hereinbefore described and shown. 5. The use in conjunction with such improved camera back and carrier of a light-tight bag furnished with an elastic nose or its equivalent for changing the carrier and plates, substantially in the manner hereinbefore described. 6. The application of my invention to existing camera backs, and to camera backs so made, by converting the two frames into a single frame and otherwise, substantially as hereinbefore described.

IMPROVEMENTS IN PHOTOGRAPH BURNISHERS.

No. 789. WARREN HIGHLMAN BOLES, Syracuse, county of Onondago, New York, U.S.—January 18, 1887.

This invention relates to machines for burnishing or polishing articles or materials of various kinds, but more especially photographs, and described with special reference to this class of machines my invention has for its object to economise the first cost of manufacture; gain time in heating the burnishing tool, and save cost and labour in heating; make a durable and easily adjusted machine, and one having readily removable parts, avoid collection of soot, and generally to remove objectionable features I meet with in such machines as have come under my notice in a long practical experience in the use and sale of this class of goods.

The invention consists in a tubular or flue burnishing tool, heated by a kerosene or other cheap burning fluid lamp, or by gas; means for adjusting and removing such tool; means for ascertaining, and thereby regulating its temperature; means for readily applying and removing the heater; and also a tubular ventilated feed roll.

The frame may consist of two upright castings, connected and braced by a table, detachably bolted thereto. The upper ends of these uprights are provided with housings for the journals of the feed roll, and this feed roll I make hollow so as to ventilate it and thus prevent condensation of vapours thereon, thus avoiding spoiling the picture or rusting the polishing tool.

The surface of this feed roll may be roughened or milled by means of a nurling tool in a lathe, to give it the necessary bite or friction upon the

picture to advance it regularly and uniformly over the burnishing tool. A hand crank may be attached to the feed roll to rotate it. The burnishing tool is located beneath the feed roll, and consists of a tubular casing, having the polished, and if desired, nickel-plated surface, the projecting arms at each end, which have tapped seats which rest upon pivot or fulcrum screws, arranged in screw-threaded lugs on the uprights.

These screws, by vertical adjustment in the lugs, admit of the raising or lowering of the burnishing tool with respect to the feed roll, and said screws may be set in such adjustment by the lock-nuts. The arms are connected by a rod to prevent their warping out of alignment with the screws.

On the opposite side of the burnishing tool a central arm projects out over the table, and is provided with a temper screw whereby the requisite pressure may be given to the picture, and screw bearing or seating on the table to this end, and its rotation in the arm serving to move the burnishing tool as a lever upon its pivot screws. This construction enables me to gain complete and instant control of the pressure upon the pictures.

Obviously by lowering the arm on its screw, the tool may be readily removed from the machine for repair, or cleaning, or replacement. Damage to and loss of pictures are of quite frequent occurrence in burnishers now commonly used, owing to the lack of provision for ascertaining and regulating the heat. In my invention the burnishing tool is made hollow and open from end to end, holes being made in the uprights in alignment with the tool so as to obtain a through and through passage. An opening is made in the lower part of the tool, about midway of its length, and this opening has at one side a stationary fender, and at the other a hinged fender or hood, and in this opening and between these fenders is received the chimney of an ordinary coal oil or other burning fluid lamp.

The hinged fender permits the ready insertion and removal of the lamp or heater. The burnishing tool being hollow and open from end to end a natural draught will be had through it, and combustion will be stimulated and the rapid heating of the tool ensured. A thermometer is applied to the burnisher in order to enable the operator to ascertain and regulate the temperature of the burnisher. The wick of the lamp will be raised and lowered to increase or diminish the volume of flame and heat according to the indications of the thermometer. Some of the advantages of my invention are as follows:—

1. There is never any possible danger of the picture being spoiled by the smoke coming in contact with the face of the same, as the smoke emerges within the flue, and is carried off at the ends of the same by the draught.

2. The accumulation of soot under the burnishing tool is avoided by the draught through the flue, which carries off all the smoke, and thus saves the necessity of using the fuel to heat the soot over and over again, as is the case with all burnishers having no draught.

3. The tension is even and invariable, absolutely positive and alike on both ends, and gained by leverage from one point, and hence there is no possibility of the picture running crooked or being twisted.

4. The heat can be graduated at command, by simply raising or lowering the wick of the lamp, and can be accurately gauged by the thermometer, consequently the chance of blistering or discolouring by getting the burnishing tool too hot is avoided.

5. My machine will burnish the cards equally as well on the edges as in the centre, as the heat is uniformly distributed by the draughts created by the flues under the burnishing tool drawing the heat uniformly from end to end of the tool.

6. The burnishing tool can be cooled much more rapidly than any other, as it is only a hollow tube of metal, instead of a solid block of iron; hence, if it is necessary to remove the burnishing tool to remove a scratch from the face of same, it can be readily done without danger of burning.

7. The thermometer attached to the side of the flue will tell precisely what degree of heat the burnishing tool has attained; consequently, one is not compelled to remain in doubt, and thus saves the necessity of defacing two or three pictures before ascertaining whether the burnishing tool is in proper condition for work.

8. There is no possibility of any moisture forming or condensing on the feed roll or polishing tool during the process of heating, because the feed roll is made hollow its whole length, thereby creating an air chamber through the centre of the same from end to end; this positively avoids the serious danger of spoiling the polishing tool or pictures by contact with such moisture.

Prior to my invention, it has been customary to roughen the surface of feed or pressure rollers by longitudinally serrating them by draw-filing, but this is an expensive operation.

I accomplish this roughening in a better and far more expeditious manner by the use of a nurling tool in a lathe.

The invention herein is applicable to mangles and calendering machines.

What I claim is:—1. In a burnisher, a tubular burnishing or polishing tool, open from end to end, and having an opening to receive the chimney of the heating lamp, and a hinged fender or hood to permit ingress and egress of the lamp combined with such lamp, substantially as described. 2. In a burnisher, a tubular burnishing or polishing tool, open from end to end, and having an opening to receive the chimney of the heating lamp, and a hinged fender or hood to permit ingress and egress of the lamp, and a stationary fender cooperating with the hinged fender to enclose the upper end or outlet of the lamp chimney combined with such lamp, substantially as described. 3. In a burnisher, a burnishing tool provided with fulcrum arms, and adjustable pivot or fulcrum screws on which said arms rest, and an intermediate temper screw, substantially as described. 4. In a burnisher, the burnishing or polishing tool, and a heater therefor, combined with a temperature-indicating device, such as a thermometer, substantially as described. 5. In a burnisher, the tubular feed roll, open from end to end to ventilate the same, combined with a burnishing tool and means to heat the latter, substantially as described. 6. The feed roll of a burnishing machine, the acting or feeding surface of which is nurlled, as distinguished from draw-filed, substantially as described.

THE premises of Messrs. Batiste & Son, photographers, 516, Oxford-street, London, have been destroyed by fire.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
March 29	Bolton Club	The Studio, Chancery-lane, Bolton.
" 30	Burley and District	
" 30	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 31	Liverpool Amateur	Royal Institution, Colquitt-street.
" 31	Oldham	The Lyceum, Oldham.
" 31	Hull	
" 31	London and Provincial	Mason's Hall, Basinghall-street.
April 1	Halifax Photographic Society	M. Manley's, Barum Top.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. William England, Vice-President, occupied the chair.

The CHAIRMAN said that he had just received a note from Mr. J. Traill Taylor, stating, on behalf of a committee, that as Mr. W. K. Burton was about to leave this country, it is intended to give him a farewell dinner on Wednesday, March 30, at seven p.m., in the Holborn Restaurant; tickets 4s. 6d. each. Those intending to be present should give their names to either Mr. Taylor, 2, York-street, Covent Garden, London, or to Mr. T. Bolas, 5, Furnival-street, Holborn, London, in order that adequate arrangements might be made. All were invited to attend. He (the Chairman) thought that many of those then present and many others not present would be glad to give a farewell entertainment to Mr. Burton, who was a useful member of the Society and a genial companion; he hoped that a large number would be present to show their hearty appreciation of him.

Mr. J. TRAILL TAYLOR added that it was imperative that all who intended to be present at the dinner should let either Mr. Bolas or himself know by midday next Tuesday.

Mr. J. R. GOTZ exhibited an improved camera, as described recently in these pages.

Mr. R. L. KIDD exhibited two bromide prints upon opal glass, which he believed to be the first which had been publicly exhibited, and in that very room, in the year 1880; he believed that they were the first which had been produced commercially. They had been since much exposed to the sun, so that the exposed part of their plush backing, which he exhibited, had changed colour considerably, yet the adjacent whites of the opalotypes were as pure as ever. He also exhibited old and large bromide prints on paper, which he said had not altered in colour more than plain paper would have been likely to have done under the same conditions; one of the prints was a likeness of the late Sir G. B. Airy, Astronomer Royal.

Mr. W. BEDFORD asked if a warm tone could be given to the prints.

Mr. KIDD replied that it could be by mercury treatment followed by ammonia, but then they possibly might be liable to fade. In finishing an enlargement much might be done to make it look less cold; his firm used pure Indian ink in the deep shadows and cooled it down with cobalt blue towards the lights.

Mr. BEDFORD exhibited a bromide print which he had exposed to direct daylight since October 18, 1886, with opaque letters placed upon it; the light had had some slight effect in printing in the letters, but not more, he said, than had plain paper been substituted for the bromide print.

Mr. H. J. BURTON exhibited a print taken by Mr. McMahon, of Aberdeen, about the beginning of 1886, and which since had so faded as to be worthless except where protected at the edges by the frame; he said that every care had been taken in its production.

Mr. INCE had had similar fading, and had traced it to imperfect washing out of the acetic acid used for clearing.

Mr. Herbert Fry exhibited bromide prints; some of them were *menu* cards copied from drawings; he also exhibited applications of the process to thick and rough drawing papers.

Mr. J. JACKSON, a representative of the Eastman Company, exhibited bromide prints, including some excellent ones printed in Paris from wet-plate negatives. He also exhibited some views of his own, taken in Cassiobury Park, near Watford, upon Eastman's stripping films, in relation to which films he promised to hereafter give a demonstration to the Society.

Mr. T. SEBASTIAN DAVIS thought that the films would be good for cloud negatives.

Dr. W. F. DONKIN called attention to *The Indian Journal of Photography* for January, 1887, edited by Professor Sheppard, of 64, Dhurrumtollah-street, Calcutta, in which Mr. C. R. Newton had written about prints upon the Eastman paper. He squeezed them down upon oiled glass, and varnished them with gold size dissolved in benzole, after which they were not injured in the printing. He (Dr. Donkin) thought that in time stripping films would abolish paper for negatives.

The CHAIRMAN thought that the gold size would not give sufficient protection in printing long numbers. The objection to stripped films was that they could not be varnished.

Mr. KIDD had found horny collodion to protect gelatine negatives better than did varnish.

The CHAIRMAN had not found it so.

Mr. A. SPILLER thought that much depended upon the kind of collodion used.

Dr. DONKIN had found Obernetter's paper to compare favourably with albuminised paper in the results.

Mr. W. E. DEBENHAM stated that some persons complained of the coldness of bromide prints who also spoke of the delicacy of platinum prints, so they seemed to be a little inconsistent.

Mr. F. T. BEESON said that in enlarging upon bromide paper it was difficult to get a good picture unless the right time of exposure had been hit upon. Could any one tell how to avoid this by modifying the development?

Mr. SPILLER replied that a good print could not be obtained if the operator were clumsy over exposure. A good print could be obtained upon bromide

paper from an indifferent negative. Such was not the case with platinum paper.

Mr. C. F. PRITCHARD said that a platinum print had more detail in the shadows. Mr. DEBENHAM thought that that was just where platinum prints were found wanting; pictures dense in the high lights were specially suited to platinum printing.

The CHAIRMAN remarked that it is difficult to get good bromide prints from a hard negative. He then exhibited two prints from the same negative, one upon bromide and the other upon platinotype paper; the latter was the best.

Mr. DAVIS said that one or two isolated examples proved nothing. Mr. Keene's negatives were taken specially for the platinotype process.

Mr. FRIESE GREENE had found bromide prints to be permanent during the five or six years he had been turning them out; he found that the public appreciated them, and the bromide prints had improved his trade wonderfully.

Mr. KIDD said that his experience was that cultured people liked the black tones better than the ordinary photographic colours.

Mr. W. R. ROBINSON asked if anyone present had had experience in toning bromide prints with platinum.

Mr. BOLAS said that those who intend to come to Mr. Burton's dinner can pay when they are present at it, but the Committee want to know by Tuesday next how many are coming.

The meeting then broke up.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, March 17, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. W. H. PRESTWICH presided.

Mr. H. M. HASTINGS said that he had made a very rough analysis of "anti-calcaire," and it seemed to be "soda-lime;" it contained some carbonate, for it effervesced with acids.

Mr. A. L. HENDERSON remarked that it was a reducer, for he had developed photographs with it.

Mr. J. B. B. WELLINGTON exhibited platinotype prints of snow scenes; the negatives were taken upon Hampstead Heath during the fall of snow, with five seconds' exposure.

Mr. L. Medland also exhibited prints of snow scenes.

Mr. J. J. BRIGINSHAW exhibited prints upon platinotype paper which had been kept for two years before exposure; the paper had been kept in its chloride of calcium tube in a permanently warm and dry cupboard all the time; the temperature of the cupboard was about 70° Fahr. The prints were flat and dim.

The CHAIRMAN remarked that Mr. Willis himself only estimated the life of platinotype paper at two months.

Mr. H. A. BRIDGE had found it to become useless in about six or seven months; his samples usually kept good for about that time in the chloride of calcium tube.

Mr. A. MACKIE said that ready-sensitised silver paper usually improved a little at first by keeping.

A question in the box asked: "A customer demands that the negatives of some portraits that were taken and paid for in the usual way some time since should now be given up to him without farther payment; can he have any legal claim to them?"

Mr. BRIDGE said that he had no claim whatever; the photographer contracted to deliver, say, a dozen *cartes*; it was nothing to the purchaser how the photographer produced them; he might have turned them out with a coffee mill if he liked.

Mr. HENDERSON asked if an action would lie against a person for selling a photograph for a Christmas card without the consent of the sitter.

Mr. A. COWAN thought that it would.

Mr. HENDERSON added that at all events it would be a breach of trust on the part of the photographer.

Mr. J. R. GOTZ found that orthochromatic plates produced by bathing had their rapidity thereby increased; with such plates a yellow screen must generally be used in daylight, or in any light very rich in blue rays. Obernetter had produced some plates which could be used in daylight without a screen, and could be kept without alteration for at least six months; he had not yet received any of them.

Mr. J. TRAILL TAYLOR said that, to the loss of the Association and of British photographers, although to his own gain, Mr. W. K. Burton was about to leave England for Japan, as Professor of Sanitary Engineering in the Imperial Institute of that country. It was a good government appointment. He would sail on that auspicious day, the first of April. Seeing that Mr. or, as he would now designate him, Professor Burton had long been a valued member of their Association, he (Mr. Taylor) felt that he was only doing right to make this announcement, in order to afford them an opportunity of expressing their sentiments on such an occasion.

The Chairman stated that the Association would greatly feel his loss.

Mr. W. M. ASHMAN, as Vice-Chairman, said that all the other photographic societies would also miss him.

Professor W. K. BURTON responded that the remarks which had been made were exceedingly kind, and he must say very seriously, that although all his friends said that it was a good appointment, he felt thoroughly miserable and wretched about going away, chiefly because he had to leave all the friends he had made in photographic circles. The greatest pleasure he had had since he came to London years ago had been in meeting congenial spirits in photographic societies, and he had attended more of the meetings of that particular Association than he had of any other. He regretted to have to leave them for a few years, and when away he should often think of their kindness to him.

Mr. HENDERSON proposed, and Mr. COWAN seconded, that Professor Burton should be elected an honorary member of the Association during the term of his absence.

This was carried with acclamation.

Mr. COOK thought that the Association should possess the portrait of Mr. Burton.

Mr. TAYLOR thought so too, and would undertake to present one to each member. He stated that in consequence of the interest which had been exhibited by photographers at a recent public sale in a book by Bigelow he had brought it to exhibit to the members that evening. The work was *Artistic Photography, and How to Attain it*, by L. G. Bigelow. He then suggested a discussion on the question why cyanide of potassium was not more used for fixing gelatine plates.

Mr. HENDERSON mixed a little of it with his thiosulphate of soda solution when the latter fixed pictures slowly.

The CHAIRMAN had used it extensively for fixing gelatine negatives.

Mr. ASHMAN said that bromide of silver would fix more rapidly in thio-sulphate of soda than in cyanide of potassium, but that if the emulsion contained iodide the conditions might be altered.

The HON. SECRETARY asked for a formula for preparing a fine-division plate which would do for photo-microscopic purposes.

Mr. HENDERSON thought that bromide of zinc might do to make an emulsion for the purpose; it threw down bromide of silver in so fine a form that it might be washed out of the emulsion; it ought to be a slow plate for the purpose mentioned.

Mr. MACKIE asked if glycerine had any solvent action upon chrome-almud gelatine.

Professor BURTON remarked that a statement had been made that in the case of a stripping film attached to paper by soluble gelatine it was said that when the latter became insoluble the film could be got off by adding a little glycerine to the warm washing water. It seemed to be highly improbable, and he should like to know if it were true. Acids or alkalis would help to get off the film after some of its chrome alum had dialysed into the soluble substratum; he usually added a little citric or acetic acid to the warm water.

Mr. COLES thought that much depended upon the gelatine whether the film would or would not come readily off a glass plate.

Mr. MACKIE said that Mr. S. G. E. Wollaston had made the statement about glycerine.

Mr. ASHMAN suggested that Mr. Wollaston should be invited to demonstrate the matter experimentally before the Association.

This was agreed to, and the meeting broke up.

CAMERA CLUB.

On Thursday, March 17, Mr. H. J. GIFFORD gave a demonstration and explanation of his method of making collodio-bromide emulsion and coating of lantern plates therewith. Mr. H. O'Parrell occupied the chair.

Previous to the address the CHAIRMAN drew attention to the projected excursion of members and friends, arranged for April 16, to the Flayes and West Wickham district, and

Mr. DAVISON made some remarks upon an interesting set of prints which were mounted upon one of the Club screens. These were prints from negatives of fireworks and illuminations at a Calcutta Jubilee celebration, taken by Major Waterhouse upon plates that he had treated orthochromatically, and were specially interesting coming from such a source.

Mr. GIFFORD went through his demonstration, and explained upon the black-board how he arrived at his formula. An adjournment was then made to the dark room, and some plates were coated and others previously prepared exposed and developed.

In the discussion which followed, Mr. J. KING said that to obtain clear glass he had at times thought that a somewhat rapid development should be given. If kept long under development or with any forcing the plate was clouded. This, he thought, was staining. He had noticed that some gave clear glass, others from the same batch, under exactly the same treatment, showed stains, and if proceeded with further gave dichroic fog.

In answer to a question whether paper could be coated with collodio-bromide emulsion, Messrs. GIFFORD and KING gave affirmative replies.

The discussion was continued by Messrs. ATKINSON, DAVISON, and GALE, and in conclusion the CHAIRMAN remarked upon the interest this subject should have. It was hardly to be expected that collodion plates were coming in again, but still it was said that Mr. J. B. B. Wellington had lately made some very rapid orthochromatic collodio-bromide plates, and it was possible that we might return to the old collodion film, which certainly had some advantages over gelatine-bromide.

On Thursday, March 31, an exceptionally interesting lantern slide exhibition has been arranged. Slides will be shown or sent by Messrs. F. Dunsterville, C. B. Wright, Frith, and Gale. Dr. Johnson will exhibit some microscopical slides with a new arrangement, and Mr. Frank Howard will exhibit slides and make some remarks specially in regard to printing-in of clouds. The exhibition will commence at eight p.m.

MANCHESTER PHOTOGRAPHIC SOCIETY.

LANTERN SECTION.

THE usual monthly meeting of this Section was held at 36, George-street, on February 23, 1887.—Mr. John Schofield in the chair.

The HON. SECRETARY of the Lantern Section, Mr. W. Watts, said he expected a number of exhibits for the evening, but was disappointed, as many had not turned up. He was pleased to say some beautiful slides had been received from Mr. George Smith (the Scioptic Company) and a large parcel of well-executed coloured slides from Messrs. Wilkinson, of Sunderland.

The CHAIRMAN said the first business was a discussion upon the comparative results of gas in high-pressure bottles and gas in bags, if the members had had an opportunity of judging from the use of both at the last meeting of the Section. Personally he was not at all satisfied with the performance of gas bottles as used at the last meeting. The light from them was certainly very intense, and probably necessary when you had large discs and great length of room to contend with, but which you did not meet with in ordinary lantern work, but in a moderate room he believed them to be useless. It was, he

thought, quite possible to have too much light, for beyond a certain power it was wasted. He found that if in ordinary daylight we could get a disc of ten feet with a "blow-through" jet thirty feet off which was just visible, that was sufficient for most purposes, and if you got a light more intense than that you would get something that was not natural and which would expose the defects of the slides; on the other hand, gas bags would give all that was required from forty to sixty feet with mixed jets. The objection to bags was that they were too bulky, but they were, in his opinion, the best arrangement we have at present.

Mr. W. L. CHADWICK said the question was, Were the bottles a success at the last meeting? He thought not. He said whether we use gas from bottles or bags, if it came out at the same pressure the light would be the same. Higher pressures with suitable limes and jets gave a more powerful light, and he admitted the light was at the last meeting brighter when the bottles were used than when the bags were substituted, but the bags had not fair play. When Mr. Jones (who worked the lanterns) started he had ninety atmospheres of pressure in the bottles, and the reducing valves were set to allow the gas to issue at a high working pressure, and the gas, which cost 25s., and 5s. carriage to Manchester (being at the rate of 8d. per foot for oxygen, and 6d. for hydrogen), was used in an hour and a quarter; this, he said, was used sooner than it otherwise would have been by reason of Mr. Jones having both lanterns lighted up at one time and dissolving by an arrangement in front of the objectives; but why did he not use the dissolving tap? Mr. Jones said, in reply to this question, that the high pressure was "too great a strain on the dissolving tap." Now, turning to the bags, Mr. Jones had only three fifty-six-pound weights on his double pressure boards, using the largest size bags, and this he thought was not enough for a sixteen-foot picture, or, at all events, to show in comparison with bottles working at a much higher pressure; personally, he frequently used as many as five fifty-six-pound weights on his own bags, which had been in use five or six years. Then, again, everybody knows the hard limes are not so suitable for low pressures, and in Mr. Jones's case he had special hard limes for the bottles, but he likewise used these extra hard limes when the bags were being used; that, again, was unfair to the bags. Under these circumstances, he said, the so-called test was no test at all. He was quite in favour of any arrangement which would be more portable and convenient than gas bags, and gave a description of some of the methods he had seen in use in America, and thought for amateurs the arrangement of Mr. George Prouse, of Montreal, was very good, namely, filling a cylinder of about three feet cubic capacity by means of water pressure, which was in Manchester from sixty to seventy pounds in many places. He also described an arrangement used by many Americans, where the retort was also a holder, and the gas generated in a strong retort of about a cubic foot capacity to a given pressure; he had seen a most successful exhibition conducted by this arrangement, namely, using the gas straight from this retort and holder combined.

Mr. J. G. JONES said the reason why he did not dissolve at the back was that Mr. Chadwick sent him a message from the platform to the effect that he should like the slides to be got through quicker, as there were a great many to show, and he (Mr. Jones) simply left the two lights on to facilitate matters. He started with twenty-one feet of oxygen and nineteen of hydrogen, all of which he should not have used had he had time to arrange his lights. Why he had gone in for bottles, was size of disc, distance, and portability. With the bottles you got greater pressure than with the bags. He considered it unsafe to use more than three fifty-sixes on bags, as you never knew the state of bags. Five fifty-sixes was an excess of pressure for any size bags.

Several members said they frequently used as many as five.

Mr. LEADER WILLIAMS said he agreed with Mr. Chadwick that five fifty-sixes might be used with comparative safety on large bags, but, on the other hand, was bound to say he had never seen anything extra in the light when more than three were used; and, in reply to Mr. Chadwick, said he referred to blow-through jets taking the hydrogen from the main.

Mr. CHADWICK said that he thought five fifty-six-pound weights were sufficient for general use; then why did we go in for these excessive pressures? Simply for portability sake, and that was more than balanced by the extra cost. Referring to the respective cost of gas in bottles and bags, he said at the present time eight feet of oxygen at 8d. per foot would be 5s. 4d., ten feet of hydrogen at 6d. would be 5s., with 5s. carriage to Manchester, made a total of 15s. 4d., against which we could produce the same quantity at home for 2s. As far as economy was concerned, both with respect to the gas and the plant, and the maintenance of it, the bags had the advantage considerably.

Mr. MELLOR had had some years' experience both in the use of cylinders and bags. Supposing the bags were suitably weighted, he could distinguish no difference on the screen. The only fear he had about using oxygen was that you were unable to see what was the state of the inside of the cylinder. The only advantage bottles had over bags was portability. He thought the question to be discussed was how many inches' displacement of water is the proper pressure for certain sizes of discs.

The CHAIRMAN thought about six inches' water pressure for the ordinary exhibition room, but if you want to use blow-through jets four inches of water pressure was plenty.

Mr. CHADWICK said bags and pressure boards were not a very good mechanical contrivance, the pressure was ever varying according to the position of the pressure board on the bags. He had received a letter from a member asking him to state whether pumice stone, gauze, &c., were necessary in the mixing chamber, to which he might say that he never used anything of the sort.

Mr. FURNIVAL contended that if you wanted extra pressure for long distances you could get it with more safety from the bottles than the bags.

Mr. WILLIAMS advised amateurs who wished to show their pictures to advantage not to use above an eight-foot disc. A large disc weakened the picture, while a medium-sized one made it richer and fuller.

Referring to the durability of gas bags, Mr. CHADWICK said his present bags, which were in good order, had been in continual use every season for five or six years.

Mr. OKEL said he had used his bags many times every year, and he had only had two bags in twenty years.

Several other members spoke to the same effect.

Mr. Chadwick then proceeded to show some slides sent by Mr. Smith, of the Scioptic Company (*Hedgerow Studies*), using a single lantern and Beard's new "self-centering eclipse carrier." The effect was very good, and most members were delighted with the effect. Phillips's carrier was also shown.

The ordinary meeting of this Society was held on March 10, 1887, at 36, George-street.—The President, Mr. A. Coventry, in the chair.

The minutes of the previous meeting were read and passed, and the ballot taken for Messrs. Robert Peel and W. Tomlinson, both being elected members.

The entire evening was occupied in inspecting a collection of members' pictures and selecting a presentation print to be given to each member of the Society whose subscription was not in arrears. The exhibition was not a very large one, and many members did not compete for the presentation picture. Eighty-two pictures were, however, submitted to the judgment of the members, the selection being by ballot, and finally Mr. Chadwick's *View of Conway* was declared the winner.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held at Myddelton Hall, Islington, N., on Tuesday, March 15,—Mr. J. Traill Taylor, President, in the chair,

Mr. F. W. Hart, a member of the former North London Society, was elected an honorary member.

A question from the box was read, asking whether a mixture sold as fifteen grains of chloride of gold and sodium, seven and a half grains being pure chloride of gold, was the same preparation as that usually labelled fifteen grains of chloride of gold, seven and a half grains being pure metal.

Mr. F. W. HART said that such tubes should contain seven and a half grains of metallic gold, but that sometimes fifteen grains of the mixed chlorides contained eight or eight and a half grains, while if weighed in a moist atmosphere enough water would be absorbed to reduce the amount of metal to seven grains.

Mr. L. MEDLAND asked the experience of members in photographing snow scenes.

The CHAIRMAN said that to get the best effects a full exposure was necessary; a small stop should be used and the exposure prolonged so that detail in the shadows was fully developed before the snow-covered portions became too dense.

The CHAIRMAN then called upon Mr. E. Clifton to read his paper on *Cameras, Ancient and Modern* [this will appear in a future number].

The paper, which was illustrated by blackboard diagrams, having been read,

The CHAIRMAN said that among the cameras of a former period there was one of which no notice had been taken in the very comprehensive paper just read; he referred to the panoramic camera of Sutton, and which was of a typical character. As some of them doubtless were aware, the picture was received on a long cylindrical plate, every portion of which was in focus. He then described by what means he (the speaker) adapted the camera for using a long strip of sensitised paper, which, being pressed against the cylindrical glass, was kept in proper shape. To the dark slide he had adapted a roller at each end on which to wind and unwind the paper. He had also employed with it an ordinary lens instead of the spherical lens of Sutton. Concerning double dark slides, he spoke approvingly of a system much employed in America, although of English inception; this slide permitted two plates to be inserted in a groove at the end, the plates then being kept in position by a wooden or other opaque slide going between them, and by which all light was debarred access to the plates. Other desirable features in American cameras and slides were alluded to, more especially the manner in which the wooden square carrying the lens was stepped into a recess in the camera front instead of being slid on, and the complete withdrawal of the shutter from the dark slide while making an exposure. He endorsed all that had been said about Mr. McKellen, of Manchester, of one of whose latest productions—a 10×8—he was proud to be the owner, as in it was embodied all those features he considered necessary or desirable in a camera, especially for outdoor work. He could not conclude without a word of recognition of the ingenuity of Mr. C. G. H. Kinnear, of Edinburgh, who was the originator of the type of camera with the coical bellows and sliding baseboard.

Mr. MEDLAND said that he had been using Shew's adapter with his camera, and had found it very useful.

Mr. F. W. COX asked if there was any advantage in having a side swing fitted to the front as well as the back of a camera.

Mr. CLIFTON thought not; in fact the side swing was seldom required at all, and called for much judgment on the part of the operator when it was used.

Mr. HART said that Mr. Clifton had described an universal plate holder for the dark slide. He had many years ago made such a contrivance to take plates from 30×24 downwards of any shape or size. Mr. Clifton had mentioned Mr. Harrison's name in connection with his little metal camera, but had not touched on his share in perfecting the pantoscopic camera patented by Mr. Johnson.

Mr. Fuller exhibited an Ashford's camera stand capable of supporting a 12×10 camera.

Mr. HART exhibited and fully explained a very perfect whole-plate camera with a jointed baseboard giving a range of foci from three to forty-four inches; only so much of the baseboard as was in use need be attached to the body. It could be used for copying general studio and landscape work, and possessed every possible adjustment.

A vote of thanks to Mr. Clifton was carried by acclamation.

The next meeting will be a technical one and will be held on Tuesday, April 5.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

On Wednesday evening, March 16, this Society held its fortnightly meeting at the Greyhound Hotel, Dulwich.—Mr. Bromley Smith occupying the chair.

Mr. RYDER read a communication on *Bromide Paper*, previous to which some very fine prints on the Eastman paper by M. Nadar, of Paris, were exhibited, and were greatly admired. Mr. Ryder described M. Nadar's formula

used in the production of these prints. Mr. Ryder advocated the following modification of the formula published for use with the Eastman paper, namely, the oxalate to be increased to nine parts to each part of iron, and the bromide to be reduced to half the quantity stated.

Mr. H. SENIER (Hon. Secretary) gave a description of a series of experiments he had recently made with a view to obtaining a variety of tones in bromide prints and enlargements. Mr. Senier first converts the silver of a bromide picture into chloride by bleaching in chlorine water, after which he redevelops with ferrous oxalate or pyro; a variety of shades of red and brown can be then easily obtained by the use of bromide of potassium in the developer in greatly increased quantities, as much as twenty grains per ounce being used for warm red tones. A notable fact in connection with this process is that the redevelopment must be conducted in actinic light, otherwise no redevelopment is possible. Bromide prints which have been spoiled by over exposure can be made into good prints by this method, as the redevelopment can be stopped at any stage, a fact which is important when working large sheets of paper. Another method for producing pleasing tones in bromide prints was suggested by Mr. Senier. The print is immersed in chlorine water and partially bleached until a thin layer of chloride of silver is formed; this is easily recognised by a milky appearance being seen on the surface of the picture. The print is then washed and exposed in a strong light until the chloride of silver is reduced to a warm tint. Specimen prints illustrating each of these experiments were exhibited.

Mr. Wolff submitted for inspection some chronographs for timing photographic exposures. They are the manufacture of Messrs. Lizard & Son, and will be much appreciated by photographers.

The next meeting will be held on Wednesday, March 30, when Mr. J. Thomson, author of *China and its People*, has kindly consented to deliver a lecture on *Travels in China with the Camera*.

Correspondence.

THE RIGHT TO THE NEGATIVE.

To the EDITORS.

GENTLEMEN,—A point of great importance to photographers has just been raised by a customer whose wife's portrait I took ten years ago. The lady has recently died, and her husband now demands that I should give up the negatives to him without any payment. He demands this in the most imperious manner, saying that I am withholding his property, to which I have no legal claim whatever. Of course I refuse to do so. At the time they were taken twelve cabinets were supplied, for which 25s. was paid in the usual manner, without a word passing in allusion to the negatives.

As it is usually taken for granted that a photographer's negatives form an important item in his assets, this is a question of serious importance to the whole profession, and I write to ask your advice on the subject. The claim appears to me to be wholly unjust, and indeed preposterous. As the gentleman threatens to take prompt proceedings in a court of law to secure their delivery and enforce his point, it would be interesting to hear a high authority on the subject before entering upon the defence.—I am, yours, &c.,

ARTHUR DEBENHAM.

Royal Photographic Studio, 28, Union-street, Ryde, I.W., March 21, 1887.

ORTHOCHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In reply to a suggestion made by one of your correspondents a few weeks back I am now enabled to state that Dr. Vogel's azaline will very shortly be a commercial article in this country.

It will, it is intended, be sold in small bottles as tincture, and will no doubt be found a useful addition in the photographic dark room, for plates stained with it will keep from two to three months.—I am, yours, &c.,

J. R. GOTZ.

19, Buckingham-street, Strand, W.C., March 23, 1887.

STRIPPING FILMS.

To the EDITORS.

GENTLEMEN,—Owing to the very short time the Eastman stripping films have been before the general public there remains considerable uncertainty about them, and therefore the results of twelve months' experience may be of some value to those who are considering the advisability of taking to roll holder and films.

One of the supposed drawbacks to the films was the fear that in course of time the insoluble coating would affect the soluble substratum and prevent stripping, and this fear on the part of the makers delayed the issue of the films for nearly twelve months.

Exactly twelve months ago I received five spools of strippers (10×8), and the ease of carriage caused them to be subjected to many hundred miles' travel, for wherever I went they went in the hope of something photographic turning up.

Last August found me in Devonshire, and there I exposed the last of my five spools; on developing there were one or two negatives which I thought not worth keeping, and they were about to be consigned to my waste basket when the thought struck me that I might keep them for six months and then try to strip them to test the truth of the statement that films would not strip after being developed and dried, and I have

now the great satisfaction of saying that on Saturday last, six months after development and drying, I stripped them without the least difficulty, the paper backing coming off as freely as those freshly developed.

This I think is most important information for the tourist photographer who may from time to time desire to test his exposures, and yet afraid to do so lest he lose a good picture through not stripping at once. He can now with all confidence develop when he likes, and strip when he comes home.—I am, yours, &c.,
Wm. H. Hyslop.

City Liberal Club, Walbrook, E.C., March 23, 1887.

DOUBLE PRINTING AND RETOUCHING.

To the Editors.

GENTLEMEN,—I notice in the issue of last week's JOURNAL, the 18th, that two of my friends, Mr. Dunmore and Mr. Pringle, have made kindly remarks regarding the subject which I took up at the Photographic Club and also the Camera Club lately. My remarks then, regarding double printing and also retouching, were merely by the way. Of course I anticipated they might probably provoke discussion, as my views on these points are very decided. I am very sorry to appear to be clipping the wings of any department taken up by a few clever men connected with the photographic profession, who have shown considerable knowledge and feeling in the treatment of a subject.

I still hold the value and importance of a pure photographic production derived from without, as that which claims the very highest respect as a work of art because it is unaided. I admit that there may be as much knowledge required for building up a composite negative, and there may be as much necessarily of the individuality of the composer's mind in so doing it as there is in taking it directly from an arranged tableaux or a carefully chosen spot of a landscape; but from what I have seen yet of built-up composite pictures they are never to be compared to the naturalness of work well under management, composed from actors capable of entering with all their soul into the feeling of the subject.

In my address I sought to define the province of photography, and assigned as a reason for the resemblance of photography to dramatic art, just in this respect, that the best method for producing pictorial effects were synonymous with stage arrangements for dramatic expression.

However, this is only my opinion, and I shall abide by it till I see something equal to the desirable results which I strongly advocate and recommend in its pursuit.

There is much in favour of what both Mr. Dunmore and Mr. Pringle maintains in regard to double printing for skies, but I still—if at all possible—like to see the difficulties in photography struggled with, and not yielding to easier methods when direct or simultaneous negatives composed of land and sky cannot be conveniently taken.

For the same reason I advocate doing away with that unworthy method of stippling or hatching on the surface of a face (for it is not art) often consigned to a few girls, who very few of them can draw a bit; all that is valuable in character and history swept away for the sake of some fancied superiority of a style long effete in painting. In the JOURNAL of March 11 there is an article entitled *Methods of Retouching*, in which the writer strongly recommending "a bold and dashing effect, a very taking picture will result." He says, "Notwithstanding all that can be said in favour of this method, it always will have its glaring disadvantages as regards portraiture generally. For what is termed publication pictures it is undoubtedly good, as a brilliant result is certain to be obtained, and the loss of likeness is scarcely a disadvantage. In pictures of this class the resemblance is a matter of very secondary consideration. The public will not buy an ugly portrait, especially when it is of some one they do not personally know; but they will buy a 'pretty picture,' and make themselves believe it is also a correct likeness. Whether the public be right or wrong in this regard I will not dare to offer an opinion," says the writer. "I will only say with the old showman, 'They pays their money and they has their choice.'" Such is an extract on this subject, which clearly shows how secondary a consideration is the matter of truth and conscientious working when it won't take and bring in the £ s. d. This lies at the foundation of unhappily too much of the procedure in photographic art called retouching.

Mr. Pringle, while speaking on retouching, asks what good reason can be stated why we should be bound to leave portrait negatives with all their facial colour defects not only reproduced but exaggerated. I stated in my address that authenticity was a much valued quality or attribute in photography, and if lines or freckles unduly presented themselves it was only the result of under exposure; by giving plenty of exposure these are no more visible in the negative than they are in the subject, perhaps not so much. It is the presence of these that renders the face very human and very realistic. These are my arguments which I submitted in favour of the proposition of doing away with retouching.

Mr. Pringle may keep himself quite easy about disturbing "the sacred precincts of painting." It won't be either combination printing or retouching that will revolutionise fine art. Mr. Pringle exempts all such work as he has been advocating from exhibitions, and says, "A photographic exhibition should be an exhibition of photographs, not of drawings, nor etchings, nor paintings." Is this not an acknowledgment that he considers all such labour on a negative as alien to pure photography?
NORMAN MACBETH, R.S.A.

P.S.—I beg to say that this is the last observations which I shall make on this part of my late lecture.

EXHIBITORS AND EXHIBITIONS.

To the Editors.

GENTLEMEN,—Mr. H. P. Robinson in your last issue says that the publication of the discussion on his paper before the paper itself is printed, gives me an opportunity of ingeniously suggesting that he endeavoured to insult a foreign exhibitor.

Mr. Robinson's suggestion that I have taken some unfair advantage is entirely unjustifiable. It is not the delay in the printing of his paper, nor is it the earlier publication of your summary of the paper and report of the discussion, that "gives me the opportunity for suggesting" that Mr. Robinson had endeavoured to insult a foreign exhibitor. Mr. Robinson stigmatised the framing of this exhibitor's work as "vulgar." The work itself was so good that it earned a well-deserved medal, and I submit now, as I did on the reading of the paper, that an artist who produced such fine work should be credited with some taste, and that if his taste in the matter of framing is not in accordance with our own, it is in decidedly bad taste to call it vulgar. It is an old observation of mine that a too great readiness to apply the word vulgar, is, in itself, a very offensive vulgarity.

The opportunity for making a suggestion or comment upon a paper is afforded by the reading of the paper, and the invitation of the President for members to discuss it. The publication of the discussion before the paper is printed, does, however, afford Mr. Robinson an opportunity for bringing forward in your columns a discussion, whilst he has the advantage of being able to refer to the paper itself, and the other side can only trust to memory. I believe that my remembrance of the paper is pretty accurate, but in case I should make a slip in some minor detail this must be my excuse.

Mr. Robinson credits me with "ingeniously" suggesting that he endeavoured to insult a foreign exhibitor. Now, as he called that exhibitor's framing vulgar, and in his letter repeats that it was so vulgar as to damage the general effect of the exhibition, it seems to me to require no ingenuity, but a simple statement of fact, to say that such opprobrium is an insult.

Mr. Robinson further says that he welcomes the work of foreign exhibitors, for they receive his "with great cordiality." It is no doubt gratifying to be able to announce the cordiality with which one's work is received abroad as well as at home, but if this is a reason why Mr. Robinson should not insult a foreign exhibitor, it cannot be accepted as a reason that he did not if the fact remains that he did.

Mr. Robinson next assumes that "everybody of taste except Mr. Debenham" agrees with him that the mounts in question were vulgar. I have not yet expressed any opinion on the subject, but a gentleman, a writer very well known and respected in photographic circles, whose business it has been to criticise many exhibitions, gave me his opinion that "unique" and not "vulgar" was the proper term.

There were several other points in Mr. Robinson's paper from which I dissent, but I think the one which requires the strongest protest is his suggestion that the judges, or hanging committee, should show partiality, and favour the work of old exhibitors and those already well known. I do not say that those who have already received medals should be considered as out of competition, but surely of the two propositions the latter would have been the more graceful from the recipient of so many honours as Mr. Robinson has been.—I am, yours, &c.,
W. E. DEBENHAM.

A NEW LANTERN SLIDE CARRIER.

To the Editors.

GENTLEMEN,—I have just noticed an article with the above heading in one of the photographic annuals, and should like to bear testimony to the excellence of slide carriers made on the plan advocated by Mr. Hepworth therein. The idea, however, can scarcely be called *new*. On the 7th of February, 1881, at a meeting of the late South London Photographic Society held at the Society of Arts, I read a paper on *Willesden Paper and its Uses*, and among other suggestions I recommended it as a good material from which, in conjunction with thin wood, excellent light lantern slide carriers could be made, handing round two I had made that afternoon, one *exactly* as described by Mr. Hepworth in his article, and another in which a piece of the wood at one end could be slipped out from between the "paper" to allow the slides to be changed as often as might be required. I may add that I have a number (with this improvement) in my possession at the present time, which were made by my friend, Mr. Brooks, soon after my paper was read; and although they have travelled with us some hundreds of miles on our lecture tours, the are as good now as when first made.—I am, yours, &c.,
F. A. BRIDGE.

East Lodge, Dalston-lane, March 21, 1887.

A WANT IN THE COLONIES.

To the Editors.

GENTLEMEN,—Can you inform me if any of the numerous photographic dealers will supply a good gelatine emulsion that would stand exportation, say three months' keeping? Possibly a *very sensitive* emulsion would not keep, but a good, useful article might surely be manufactured fit for exportation. Amateurs and professionals at home, with dry-plate makers in every town, and prices varying from 4s. to 12s. per dozen for whole-plates, may not care to take the trouble to make their own plates,

but when the cost and risk of transit is considered, and the fact that almost every photographer out in the Colonies has dozens of spoiled negatives, the glasses of which are at present useless, is also remembered, you will not be surprised that some of us would like to make our own plates, if we could get a little help in getting emulsion ready made. At all events I throw out the hint for some enterprising manufacturer to take up.—I am, yours, &c.,

A. L.

Napier, New Zealand, January 26, 1887.

P.S.—Your JOURNAL and ALMANAC are invaluable. If you were six thousand miles nearer, you would have plenty of correspondence from the Antipodeans, who are doing well with the camera. Your numerous societies, where you benefit by each other's experience and see their experiments, must be grand helps! Here if anything goes wrong, it is a case of worry until it goes right, and the photographic stores do not always treat us well. Discoloured pyro, spotty paper, &c., play the very devil with our work!

PHOTOGRAPHIC ART IN CANADA.

To the Editors.

GENTLEMEN,—I think you will be pleased to hear that art photographs are now becoming most popular on this side of the Atlantic, to the exclusion of those foreign chromo and other meretricious daubs which have for so long a time disgraced our picture windows and middle-class homes. We have one Company alone who has issued a catalogue of 210 pages of matter, exhibiting for sale upwards of 100,000 art copies. This catalogue is divided into three parts:—1. Reproductions of original paintings, frescoes, and designs by the Old Masters; 2. Sculpture, architectural subjects, and miscellaneous views; 3. Reproductions of engravings, drawings, etchings, and modern paintings. Thus, at least, 10,000 original subjects are before us. In Canada, owing to the cheapness and choice of fancy woods and the plenitude of water-turning power, picture frames are produced very much cheaper than in any other part of the globe; and I quite expect to see art photographs superseding every other ornamental attraction in the tasteful decoration of our homes. If I can give you or your readers any other information I shall be happy to do so.—I am, yours, &c.

ALEX. S. MACRAE.

127, Wellington-street, Toronto, Canada, March 2, 1887.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

John Owen, Newtown, North Wales.—Portrait of lady with lions.

W. EMPSELL.—Try Piper & Carter.

M.—We have not yet completed trials of the bath.

JAMES GRAY.—We feel interested in your experiments.

G. H.—Lacquer can be obtained from any dealer in varnishes.

W. D.—The address of Messrs. Frith & Son is Reigate, Surrey.

LUMINOUS.—Varnish will not impair the efficiency of luminous paint.

L. H. M.—So far as we can learn, there are no official photographers employed in dockyards or prisons.

RICHARD BLAKE.—J. R. Gotz, 19, Buckingham-street, W.C., is the agent for that special make of ferro-prussiate paper.

JAS. EDWARDS.—We have not yet had an opportunity of submitting your communication to the author of the article in question, but will endeavour to do so.

S. GRAVES.—The design for a studio as shown on sketch No. 2 will be the best for general purposes. No. 1 is better adapted for copying pictures than for portraiture.

F. D.—We are afraid that India, while interesting, would prove rather impracticable as a country to include in a *Where to Go with the Camera* series. Thanks, however.

G. PATTERSON.—It is clearly a case of dishonesty and sharp practice. With regard to the question of combustibles, the police have power to act under the Explosives Act.

FOO.—We attribute your failure to the intensely horny character of the film. The addition of a trace of glycerine, or even Scotch ale, to the emulsion will doubtless remedy the evil.

E. D.—1. We do not know.—2. Twelve dozen plates will suffice.—3. For cathedrals surrounded by buildings get a lens that will include eighty degrees on the base line.—4. Under some circumstances density is obtained by increasing the proportion of pyrogallol.

BORNEO.—1. Stains may be taken out of engravings by the use of ozone bleach, as described by Mr. Brooks at page 244 of our volume for 1882. The strength recommended is one to ten, although it may be employed of double that strength.—2. Magnesium will be preferable to limelight.

PACO.—1 and 2. Give the plate a substratum composed of sixty grains of gelatine dissolved in ten ounces of water, to which three grains of chrome alum, previously dissolved in a little water, is added.—3. Clean the opals with pumice powder and water with friction.—4. Filter the emulsion through chamois skin.

H. C. M.—Two strands of magnesium will give double the light of one. Plain opal or porcelain will make an effective reflector. A common white dinner plate, or even a sheet of white cardboard, will answer the purpose equally well. The finest deposit can be obtained when using pyrogallol acid with wet collodion; but the finest deposit of all is that obtained with the albumen process.

R. C.—Both the orthographic and the triplet lenses may be considered obsolete, seeing that they are not now made. They are exceedingly good lenses, but have been superseded by those of more modern construction. They both gave exceedingly fine definition, but the former was not free from marginal distortion. The triplet is still used by many for copying, and it answers its purpose well.

VOILETTE writes: "I have attempted to colour photographs after enamelling, and, as you see by enclosed specimen, I have been unsuccessful. Having prepared the glass, I put on the photograph, as in ordinary enamelling (Parisian style); I poured some olive oil on the back, which at once made the transparency; then I coloured it with oil colour, which will not dry; I mixed the colours with linseed oil and a little gold size; then I tried the crystalline mediums, but still find it will not dry. Will you kindly tell me how I could make the photograph transparent and at the same time make the colours dry?"—Instead of using olive oil, employ Canada balsam thinned with benzole.

SCHOOLMASTER puts the following queries: "1. What is the usual method of washing prints in order to free them from hypo? Will nine or ten half-hour changes followed by a night's soaking and a subsequent change ensure their permanence?—2. How can you determine whether a bromide print is fixed or not?—3. Will the quick printing paper, as advertised by several firms, give results similar to the ordinary sensitised paper? and is it permanent? Can sample sheets be obtained?"—In reply: 1. The usual plan is to submit the prints to running rather than a prolonged soaking in stagnant water. If the prints be treated with very frequent changes of water for two or three hours they may be more perfectly freed from the hypo than by a day's continuous soaking.—2. If the prints be kept moving about in a fixing bath of the usual strength for fifteen or twenty minutes, provided the solution be fresh, it will be sufficient.—3. Yes, if it be skilfully used. Sample sheets are supplied by most makers.

J. N. TULLOCH, M.B.—The nearer the aperture approximates to that of the human eye—or, to be still more accurate, to a mathematical point—the more correct will be the portrait. If you have access to the writings of Sir David Brewster, in or about 1861, you will find that he enters very fully into this subject; but mathematical accuracy has to give way to expediency, and a lens must have some dimensions, which in those days for large heads were very large. Such large lenses were his *lente noire*. But we refer you to what he said. Practically, the smaller the lens employed the better. You have knowledge enough of optics to understand readily that the stop or diaphragm forms really the effective aperture of the lens, and the accuracy of the projection is in the ratio of its diminution, and this, irrespective of whether the lens be a large compound one or a single one. The mere fact of a large lens, such as you describe, being able to see round a corner as it were, proves that it will not delineate a large head properly. If demonstration be required, stop the front wholly except a small aperture on, say, the right-hand side, and take a picture; repeat the experiment with an aperture on the opposite side of the lens, and on comparing the two pictures they will be found to be dissimilar, and cannot be superimposed to produce a perfect picture. They would require a stereoscope for their examination, when they will appear in stereoscopic relief. We here refer to a leading article on binocular cameras in the JOURNAL for January 21 of the current year, which applies to the case in point. To sum up, a compound lens to produce a large head similar to one attained with a single lens, must be worked under the same conditions as regards the stop.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, March 30, will be *Lantern Matters*. This is a lantern night. Visitors are invited.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday, the 31st instant, Mr. S. G. Buchanan Wollaston will give a demonstration on *Film Photography*.

MARBLE PORTRAIT OF MR. GLAISHER.—This portrait having been now completed, Mr. Toft, the sculptor, 12, Trafalgar Studios, Maurens-road, King's-road, Chelsea, invites all photographers and their friends to call and see it and others on Sunday next between three and six o'clock.

MR. ALBERT P. BAKER informs us that his firm (the London and County Photographic Company), has obtained the exclusive right of photography of every description at the forthcoming Jubilee Exhibition in Manchester, and also at the Industrial Exhibition, Newcastle-on-Tyne.

MR. W. K. BURTON, C.E., being about to leave this country, it is intended to entertain him at dinner on Wednesday evening next, the 30th instant, at the Holborn Restaurant. The chair will be taken at seven o'clock precisely. The tickets will be 4s. 6d. each. All are invited. It is imperative that those intending to be present should signify the same before midday on Tuesday (the day previous) to either Mr. T. Bolas, 5, Farnival-street, Holborn, or to Mr. J. Traill Taylor, 2, York-street, Covent Garden, W.C.

** ILLUSTRATED SUPPLEMENT.—With this number we give a portrait of Mr. W. K. Burton. It is a very characteristic likeness of this gentleman, and is from a negative taken in a private room by Mr. Andrew Pringle.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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FLATTED OIL BACKGROUNDS.

It will be remembered that in the article on backgrounds a fortnight ago we mentioned that those prepared in what is termed flatted oil colour are amongst the best, both as regards durability and efficiency, a photographer, whether professional or amateur, could possess. At the request of several correspondents we here give such practical details as will enable any one to prepare his own, for it must be acknowledged by all that the photographer who is able to produce his own backgrounds is in a far better position than is he who is dependent upon the local decorator. Assuming that the work has to be commenced *de novo*, we shall begin with the fabric itself.

The most suitable material is that known as unbleached sheeting. It is strong, cheap, and it may be procured at the upholsterers in various widths up to about three yards, and of any desired length. The sheeting obtained, it must be strained on a stout wooden frame, or it may be nailed on to the wall, but the frame is by far the best. The next thing is to give it one or two coats of common size of the oilshops. The object of this is to render the fabric less absorbent, because if the paint were to be applied to the unprepared canvas it would be soaked up to such an extent that two or three times the quantity would be necessary to obtain a perfectly even coating. The size as purchased will require dilution with water before use, and it must be applied tolerably hot. About one part of size, according to its quality, to two or three parts of water is a good proportion. Two coats of thin size is preferable to one of thick. The canvas having been sized, it is now ready for the paint.

Paint of different colours, ready for use, is now sold by most oilmen. For backgrounds grey is generally preferred; this may be made by mixing some white and black paint together. It is always better to add the black to the white than to proceed in the reverse direction, as the effect of the mixture is then the better under control. A small quantity of black overpowers a large body of white, while the white has a far less influence on the black. It is a good plan to mix a small proportion of red—either Venetian or Indian—with the colour, as this gives the background a warm and less sombre appearance than it would have with the black and white alone. Oilmen will, if required, supply the paint ready mixed; but, on the whole, it is better for the operator to mix it for himself, because he can then make sure of obtaining the exact tint he desires, and this is not always the case when the colour is prepared to order.

The paint must be laid on, evenly, with a large brush—one that has been well worn by use is the best. A new brush

should be avoided, as it is liable to leave the work streaky. Two coats of the paint will be sufficient, provided the fabric was thoroughly sized in the first instance. If with two coats any unevenness is apparent, a third must be applied, as it is essential that the surface be uniform before the after operation of flattening is commenced. An even surface being obtained, the next operation is the flattening, by which the glossiness of the paint is to be destroyed. The usual plan adopted by painters and decorators is to mix some colour, of the same tint as the groundwork, with turpentine alone, and this, when applied to the surface, is immediately stippled over with a large badger-hair brush, two persons being engaged in the operation. In skilled hands this method answers admirably, but in the event of the tint, on drying, not proving the right one, it is necessary to paint the background afresh, as two coatings of this flattening cannot be applied in succession.

Here is a method of flattening, looked upon by many as a trade secret, which is well suited for the preparation of photographic backgrounds, inasmuch as several successive coatings, of different tints even, can be applied without repainting. This flattening is prepared as follows. White lead and lampblack, with or without the addition of red or other colour, are mixed together with turpentine, to the consistence of thin ordinary paint. So far this flattening mixture corresponds with the former one, except that it is made somewhat thicker, but the essential difference is that one-third by measure of japanners' gold size is afterwards added. The black and red colour may be obtained ground in oil like the white lead, but we prefer to use the colours dry, so as to avoid the introduction of oil which tends to produce glossiness. The mixture must be strained through coarse muslin before use. The advantage of this preparation over that previously described is that it does not dry so quickly, while the gold size, unless added to excess, gives no gloss. It may here be explained that if one portion of the work dries before the adjacent portions are laid on the junction is sure to show in the form of brush marks when the background is finished. Hence in flattening it is customary to work with the doors and windows closed, so as to avoid draughts, which would accelerate the evaporation of the turpentine.

The flattening preparation is laid on as evenly as possible with a large painting brush, such as that employed for the paint. It is then stippled over with a dry one. This stippling consists in gently dabbing the surface with the points only of the brush, so as to destroy the marks, if any, left in applying the colour, as the operator is scarcely likely to possess a costly badger-hair brush; a painter's ordinary "duster," or, indeed, any other brush may be used instead. On one occasion we remember using—and successfully, too—a common hearth brush for the

purpose. It is somewhat important that the brush used be composed of bristles, and not the fibre which is often substituted in the commoner kinds of brushes, because with these the fibres are prone to mat together with the colour and so produce patchiness. In stippling it is important that only the tips of the bristles touch the surface, and these should be kept as dry as possible by wiping or rubbing on a piece of old cloth.

With a little practice, owing to the comparative slowness with which this flattening mixture dries, one person may execute the whole of the work. But until this experience is acquired it is better for two to be engaged in the operation—one to lay on the colour and the other to do the stippling.

A PROPOSAL FOR A SENSITOMETER.

NEVER was the want more strongly felt than at the present time of a sensitometer giving greater accuracy of result and possessing a wider range of applicability than those in present use. Several important points in connection with orthochromatic photography seem to hinge mainly on the question of relative exposure, but there exists at the present time, so far as we are aware, no ready means of accurately making such a computation.

The Warnerke instrument, useful as it is for certain purposes, is entirely and hopelessly out of the question; for, independently of its readings being to some extent arbitrary and open to doubt, the results it gives with white and coloured light respectively are quite at variance with one another, owing to the character of the rays absorbed and given off by the luminous tablet. Spurge's sensitometer, or one on that principle, is, however, correct in principle and well adapted for the comparison of light, or screens, or colours of any description; but it is, unfortunately, not in general use, and is not easily constructed by an inexperienced hand.

We have ourselves experienced this difficulty in connection with the measurement of the comparative colour sensitiveness of different plates, and in the course of our attempts to overcome it a plan has suggested itself which, if not capable of yielding the accuracy derivable from Spurge's instrument, is much simpler and easier to construct, while it can be rendered sufficiently correct to be really useful. What we require is an instrument enabling us not only to compare the sensitiveness of two or more plates to light of one particular kind and to state the result in absolute terms, but also to compare the sensitiveness of the same or different plates to rays of different colours. Thus, we will suppose we wish to compare an ordinary with an orthochromatic plate in every possible manner: we have to test, 1st, their individual sensitiveness to ordinary light; 2nd, their individual sensitiveness to yellow (or other coloured) light; 3rd, the difference in their respective sensitiveness to ordinary and coloured light. In order to satisfy ourselves on these points, we should be in a position to make a statement something like the following, ordinary and orthochromatic plates being spoken of respectively as A and B:—1st, To ordinary light, A twice as sensitive as B; 2nd, using a colour screen, B twenty times as sensitive as A; 3rd, A one hundred times and B three times, say, more sensitive to ordinary light than to the light passed through a colour screen.

Until such *data* can be arrived at with tolerably strict accuracy, it is hopeless to expect to place orthochromatic photography on a truly scientific basis, or to remove the many doubts that now exist as to its value and its application. But

the means do not exist for the purpose, hence the suggestions we have to make, which are based upon actual experiments with a roughly constructed instrument such as we shall describe.

The principle we have utilised is that originally put forward by Mr. Alexander Cowan some years ago, when the question of sensitometers first arose, consisting of a sort of dark slide, fitted with a drop-shutter front carrying apertures of different sizes to represent different tints or degrees of rapidity. The claims in favour of this arrangement were that by arranging the dimensions of the apertures so that they bore a certain relation to one another, a plate, or plates, might be exposed to any kind of light—candle, gas, or daylight—and the duration of exposure necessary to produce an impression calculated in absolute terms, and thus plates of different kinds, or lights of different colours, compared with the greatest accuracy.

The objections raised to the proposal were, that in the rough model first exhibited to illustrate it, no allowance was made for the constantly accelerating speed of the drop, and that, consequently, the lengths of the apertures bearing a definite relation to one another, the direct comparison of their exposures was impossible. This fault is, of course, easily remediable, as it is a simple matter to calculate the dimensions of a series of apertures giving exposures strictly proportionate to each other, if (for there is an if) the element of friction could be entirely eliminated. Whether Mr. Cowan, or any other experimentalist, proceeded any further with this idea we are not aware, but such is the principle upon which we propose to work.

In constructing such an instrument the points we laid down were the following:—A total effective drop, that is, the longest exposure given of definite length to be divisible into tenths and hundredths. In order to avoid the trouble and inconvenience of calculating, measuring, and piercing a large number of separate apertures, a single three-sided aperture to be used, one side forming a curve representing the gradually accelerating speed of the drop. To overcome the resistance of friction as far as possible, the shutter to be of considerable weight; and, finally, in order to give the instrument as wide a range as possible, the aperture to be of fair dimensions.

These ideas were carried out in the form of an instrument which, though comparatively useless for the immediate purpose in view, as we shall point out, served to indicate where and in what manner the principle can be improved for practical use. A description of the instrument actually constructed will enable us to point to its errors and show how these can be modified.

In the first place, an ordinary printing frame was taken, and the front portion cut away in such a manner as to permit a "drop" of wood or metal to slide freely *almost* in contact with the glass or negative when in position, suitable guides being attached to retain the drop in place. With the construction of the "drop," to be presently described, the "structural alterations" were completed. In the inside of the frame, however, in the ordinary place of the negative a sheet of thin ebonite was fitted, having a slit cut along its centre in a direction at right angles to the fall of the shutter.

The most important part of the instrument had now to be considered—namely, the drop, with its various dimensions. The first point to be settled was the extreme limit of exposure, and this we decided, for the convenience of experiment, should be one-tenth of a second. It was clearly desirable that the shutter should get well into motion before the exposure com-

menced; a drop of two inches before the aperture opened was therefore allowed for. These *data* being fixed upon, we were able to calculate the dimensions and shape of the exposing aperture. The shutter was constructed of one-eighth-inch mahogany, with a heavy piece of inch-stuff at either end to give it weight, and had a sliding motion of a little over fifteen inches. This permitted the drop to be used in *either* direction, the exposure commencing in each case after a fall of two inches, of which more anon.

In cutting the aperture the following was the mode of proceeding: A base line was drawn across the shutter two inches from the slit in the ebonite screen, when the shutter was pushed to one end of the slide. The length of the base line is arbitrary, and may be made to suit any size of plate, but whatever its length it must be accurately divided into tenths. Upon one end of the base line a perpendicular is erected representing the length of drop required to give an exposure of one-tenth of a second on the maximum, the other end of the line being zero. If the speed of the drop were uniform, all that would be needful would be to connect these two points by means of a straight line forming a right-angled triangle, but this right line takes the form of a curve in order to provide for the gradual acceleration. The curve is formed thus: Divide the base line accurately into tenths and upon each division erect a perpendicular, the whole forming a series of ten parallel lines. Commencing next from zero, point off with the compasses the distance the shutter is computed to fall, in each one-hundredth of a second, from one to ten, joining these points to form the curve. The following are the figures for a curve representing a maximum exposure of one-tenth of a second under the condition given, namely, exposure to commence when the shutter has dropped two inches. The figures are in decimals of an inch, commencing with the perpendicular next beyond zero:—

.406	1.33	2.40	3.65	5.00
.850	1.85	3.00	4.33	5.80

Such an instrument will give a graduated tint starting from the point of longest exposure, and to read off the duration of the exposure it is only necessary to measure the length of the visible impression. Thus, in the instrument we have described, the length of the base line is $4\frac{1}{8}$ inches, that is, one hundred one twenty-fourths of an inch. With a strip of ebonite of that length divided into tenths, and one of the latter again subdivided into tenths, we are enabled to measure off the length of a "tint," each subdivision of one twenty-fourth of an inch representing an exposure of the one-thousandth part of a second.

We should, perhaps, modify the last statement by saying "should represent;" but, owing to the interference of friction and other causes, which we shall describe next week, in this case it is not so. However, as we shall show, there is nothing to prevent a tolerably accurate instrument being constructed on these lines.

THE BURTON Farewell Dinner held on Wednesday evening was a great success. Mr. W. H. Walker presided. About fifty gentlemen were present, some of whom came a distance of 400 miles to show their esteem for the guest of the evening. A very handsome chronograph, case in oxidised steel and gold, together with a gold chain, was presented to Mr. Burton in the name of a few friends. We shall give a fuller report of the proceedings next week.

A QUESTION raised a week ago by Mr. Arthur Debenham, of Ryde, concerning the sitter's right to possess the negative, is practically

the same as if an author were to employ a printer to produce him a determined number of printed impressions from his manuscript, and were then to claim the types by which they were printed. The demand made is preposterous in the absence of a special arrangement to purchase the negative.

THE intimation concerning the forthcoming Photographic Convention given by Mr. Briginshaw in our Correspondence columns is one to which we direct the special attention of photographic societies, and more particularly of their secretaries. There are many matters, apart from the technical details of photography, which concern the whole body of the fraternity, that might be discussed with great advantage by delegates from the various societies, and an opportunity like this ought to be taken full advantage of.

PHOTOGRAPHY had quite a field-day at the last meeting of the Royal Microscopical Society. Many photographs of objects of particular interest, photographs showing the power of lenses made with the new optical glass, and others, again, illustrating the capabilities of orthochromatic plates, were exhibited.

So much has been said about the new glass, and Zeiss's objectives (with eye-pieces to correspond) made from it, all to the detriment of English manufacturers, that it will be satisfactory to put before our readers the *ex cathedra* opinion of one of the greatest living authorities, the Rev. Dr. Dallinger, President of the Royal Microscopical Society. They may be reminded that the new series of lenses consists of newly devised objectives, and special eye-pieces to be used with them. Dr. Dallinger, by means of constantly testing the power of certain of his own objectives, knew exactly what they were capable of performing in a certain direction. When he examined the new Zeiss objectives as against those of his own, he was not able to discern any real advantage that the former possessed when each was used with the new eye-pieces, though the Zeiss glass with its own eye-piece was in some points superior to the English glass with the ordinary eye-piece. Since that first trial English opticians have set to work upon the devising and constructing of new forms of objectives and eye-pieces with the Abbé glass, and the reverend gentleman's verdict upon them is as follows: "I am bound to say that the apochromatics from Jena did not impress me by this test (described) as having accuracy of technical execution equal to the object glasses (English) with which they were compared." At the same time, he was most hopefully and powerfully impressed with the potentiality of the system represented by the apochromatic lens he first examined. What the future may have in store for us in connection with lenses for photographic requirements specially cannot yet be stated, but that the new glass will be employed by English manufacturers, and employed to advantage, cannot be doubted.

IT is a little surprising that the simple vacuum pumps made on the principle of the Gifford's injector, and so many different forms of which are used in chemical laboratories, are not more frequently employed for photographic purposes—exhausting air from drying chambers, increasing rapidity of filtration, and so on. Any amateur can make one for himself, all the power that is required being a small head of water, and the simple necessary apparatus only includes a little glass and indiarubber tubing worked in a manner needing very little experience. Our attention is drawn to this form of laboratory apparatus by the account given the other day in *La Nature* of a new arrangement of the kind made and sold by a Parisian manufacturer. The instrument previously made consisted of two tubes with coned ends, surrounded by a larger outer tube of greater diameter. The cones are directed to one another but do not quite touch; the outer tube is connected to the chamber it is required to exhaust. The apparatus is attached to a water supply tap, and the supply turned on; the liquid passes out of one coned aperture into the other, and then finds its exit at the end of this lower tube, and in so doing draws the air from the outer tube with it till a high degree of exhaustion is attained. In the new apparatus the cones are joined, and one, or two, apertures made at the line of junction which serve to withdraw the air from the exhausting pipe.

THE recommendation to use melted ice or snow when a sample of pure water is required is so girt about with the respect due to old age and authority that much trouble will be experienced before the possible fallacy of the method can be demonstrated. A very excellent example, however, of the way in which organic matter (its mainly objectionable accompaniment in delicate photographic experiments) may be retained by frozen water was not very long ago shown in the United States in the city of Syracuse, the City Board of which town actually forbade the sale of ice cut from Onondaga Lake for any purpose which would bring it into contact with food, so much organic matter being imprisoned in the ice as to have occasioned numerous attacks of a dangerous disease.

THE arrangements in connection with the forthcoming Manchester Jubilee Exhibition are gradually being matured, and the Secretary has written that "the photographic sub-section are devoting a portion of their space to a history of the rise and progress of the photographic art, and are anxious to hear of specimens or apparatus bearing upon this department of the subject. They will be obliged by possessors of any such objects communicating with them at the offices, Albert-chambers, Albert-square, Manchester."

DRYING PLATES BY WATER POWER.

NOTHING in the ordinary run of photographic operations has ever bothered me so much as the drying of plates coated with gelatine emulsion. I have spent much money in drying presses; have fitted up closets and rooms; have used packing boxes, patent boxes, desiccating chemicals, Bunsen burners, egg boilers, bad language, and even roasting-jacks, in my attempts to dry plates evenly and at a suitable speed, but never until I tried water power have I got anywhere near the object I aimed at. My experiments and efforts have covered a space of several years; the subject has never been entirely absent from my mind, yet it was only lately that I achieved the object I have so long aspired to. I have examined the drying arrangements of many amateurs and professionals; have repeated them on a smaller scale at home; I have consulted many authorities, read many books and letters. I have been recommended to put my plates in alcohol, to swirl them through the air, and even to freeze them. All these (bar the freezing) I have tried, but never yet got what I wanted in perfection. But I feel that I have not lived and laboured in vain, for now I can dry plates as I think plates ought to be dried.

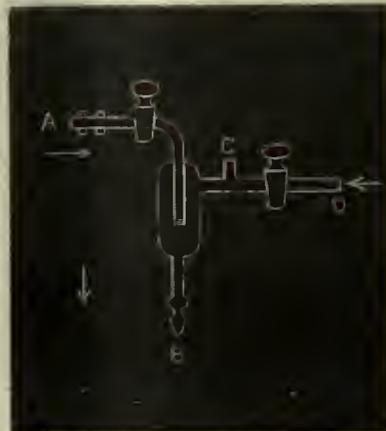
I believe that there is much misapprehension abroad as to how plates ought to be dried in order to secure to them the highest qualities. Most people in this country seek to gain the point by a current of air. So far, well. But, as a rule, this current is set up by heating the lower strata of air, and so causing an upward current of *hot* air. I do not think that heat in any shape is good for gelatine emulsion during the drying process, and heated air carries more moisture than cold air, so that heated air would not appear even to be thoroughly conducive to drying.

Another method that has come under my notice seems to be practicable only on a small scale; at least, I have not heard of it in any larger establishment. It consists of inducing a current *above* the plates by heating the air of the higher strata in a flue or some such arrangement. I doubt whether the current among the plates is so great with this arrangement, but, at all events, whatever air is set in motion is cool air, and therefore I am inclined to prefer this latter arrangement where it is found practicable. But though I have tried both these systems in various forms, in boxes small and cupboards large, I never yet could depend on my plates drying in any particular time, and sometimes my plates never dried at all.

Among other frolics, I one time made a great cupboard, fitted it with racks, carried a three-inch pipe right up through the roof of the house, and there fitted on a "swagger" cowl; at the lower part of the press I fitted "wormed" pipes, through which I sent a current of strongly heated air, which permeated the pipes, and then came out again "into the empty vast and wandering air." In spite of all this, and in spite of Shakespeare, I never knew how long my plates would take to dry in the finest weather; in damp weather I knew very well that they would never dry at all. This is merely a specimen of the trouble I took and the money I spent. I tried many other plans. Of course, some of my arrangements dried plates, but they did not do so as I wanted, that is to say, evenly, without heat, and in a given time.

It is pretty well understood that there is a right way and a wrong way of drying gelatine emulsion. The plates may be dried too quickly; in some countries to my knowledge plate makers require to protect the drying operations by sprinkling the floors with water. In America, in certain seasons, this is quite common. At Craigleugh it is very uncommon indeed. I have known plates remain damp in the cupboard I have described for weeks! Plates may take too long to dry, and a plate that has taken over, say, twenty-four hours to dry is pretty sure to be unevenly dried, and quite certain to be of very little use for anything. Such is my experience, and I have never known an exception to this rule. As I never dried a plate under about eight hours I cannot say what defects very rapid drying produces, but those who know tell me that six hours is the minimum time that ought to be allowed, and I can say from my own observation that eighteen or twenty hours is about the longest time allowable if the plates are to be thoroughly good. On the whole, I imagine that from eight to twelve hours may be put down as a suitable time for the operation. I should think it very probable that so long as the atmosphere around the plates be kept quite cool the plates would take no harm, however quickly they might be dried, but this, on my part, is mere surmise, a style of argument I deal in as little as possible.

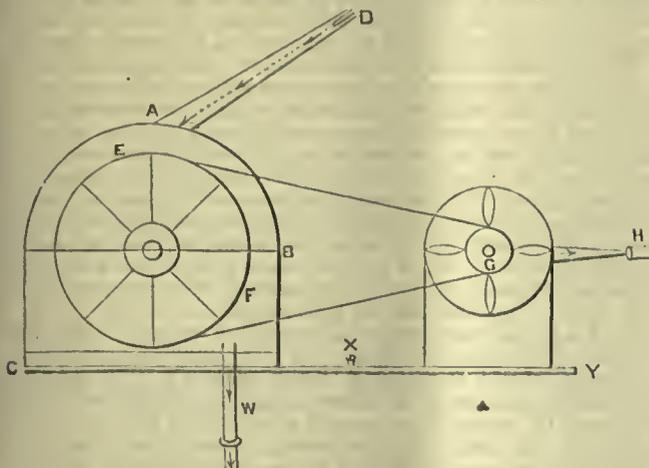
My last and my successful experiment consisted in the production of a strong and steady current of cold air. The air is quite cold enough at present for my purpose, but were the weather very warm I would certainly, and I could easily, cool it. I will show my first attempt in this direction, because it contains the germ of a good idea, though I found it too small in scale to fulfil all I require. There are two pumps known as the "Bunsen" and the "Fischer." Both produce currents by what I may call "suction." The Bunsen requires a long fall for the water supply down from the pump; the Fischer requires a long fall to the pump, or (what amounts to the same) a considerable pressure of water at the pump, as from a main by gravitation. I figure the Fischer pump to show the principle on which it works, but the one I had was far too small to produce such a current as I required for a good sized box. At A is affixed a tube leading to the ordinary tap, which is turned on till the water rushes out with some force at B. C leads to a pressure gauge showing the column of liquid supported; this I simply closed up, as I



did not require any such information. A strong suction is produced at D, in the direction of the arrow, of course. It is evident that if a tube be carried from D to the top or bottom of a box open at top and bottom a current more or less strong will be produced through the box. But the pump I have is only a small affair, and I found the current produced quite inferior to what I required. Still the result, when I used a very small box and very few plates, was so satisfactory that I determined to go into a larger line of the dry-plating business.

I thought that something in the shape of a fan might help me, especially as previously my most successful feats of drying had been accomplished in a large room, the plates being caused to rotate on a rack by a common clockwork roasting-jack. (This was fairly successful, and I was fairly happy until I got fairly roasted myself for "annexing" the jack from the culinary department. But I assure my readers I did *not* mean to steal it!) My water supply here is practically unlimited, so I resolved to use some of it to drive my little fan. There is in Langholm a congenial spirit of the plumbing persuasion, and we put our heads together (one very thickly coated and curly, the other slightly different) and made a water wheel and a blower. Here is a drawing of the outside of it, it explains itself

A BC is a box of tin containing an overshot wheel of eight or nine "scoops," not buckets. The water comes in from the main D in a very thin jet (through the nipple of an oil tin) but with considerable force, and strikes the scoops at a suitable angle, so that the driving wheel revolves seventy to eighty times per minute, according to force put on the water. EF is the driving wheel, and is simply a bicycle



wheel sixteen inches in diameter. G is the wheel that drives the fan inside the box, and the part where the belt goes round may be adjusted at two inches or one and a half inch diameter at will. (I forget the technical name for this extremity of the axle.) Thus it will be seen the fan revolves at a considerable rate. The belt, a cotton one, is made very slack, just tight enough to cause the fan to rotate. A screw at X pinches the wheel and the fan to a baseboard at the desired distance. W is the waste pipe by which the water goes into a cistern below. H is a rubber tube two and a half inches internal diameter, and goes into the bottom of the drying box, which is an "England" pattern, but has its top bored with three-eighth-inch holes with bent tubes stuck in, to let out air but keep out light. The plates are racked in the box in a common drying rack, and the air blows up among them. I have dried plates right over the air hole in about five hours, and twelve hours suffice to dry as many as I can get into the box two inches apart.

The wheel and fan cost me about £2, but I suspect they would cost a good deal more if ordered in a casual way. The plumber and I picked up parts, such as the bicycle wheel, just as they came in our way, and he charged me only "cost price" for his time. I feel pretty certain that a current of cold air is the best means for drying plates, and some reader may have the same difficulty as I once had and the same water supply as I now have. At one time I dreaded plate coating, I don't object to it at all now.

ANDREW PRINGLE.

EXHIBITING AND EXHIBITIONS.

[A Communication to the Photographic Society of Great Britain.]

I THINK all will agree with me that the chief event of the year to our Society is the Exhibition, and that it is the duty of every member to make it as perfect as possible, so that those who are interested and want to know what is new in the science, and true in the art of photography, may come here every October and judge for themselves. The outside public learns from our exhibitions the progress one of the three wonders of the nineteenth century is making; and the photographer, whether professional or amateur, acquires a knowledge of what his brethren are doing, and perhaps picks up new ideas, fresher inspiration, and intensified enthusiasm.

The time is now coming when wise photographers who look ahead should begin to think of what they shall do for the autumn shows, although I fear that too many are content to send a selection from the work done during the summer—work done without any special reference to exhibitions. In selecting your pictures, it is perhaps needless to tell you to send of your best, but it is not given to every man to know what is his best. The good and the bad, like the often-quoted sublime and ridiculous, are sometimes so nearly related that it is difficult to class them separately. It is our occupation to pursue shadows, and photographers, especially when judging their own works, seem inclined to "listen with credulity to the whispers of fancy, and pursue with eagerness the phantoms of hope." The quality of a large part of the work now contributed is much higher than it

was ten or even five years ago; so that anything sent to future exhibitions must be something more than good ordinary photography, if it is expected to claim more than a passing glance from the visitors.

It is a great mistake to send too many pictures—it is giving points against yourself. By doing so you run serious risk of breaking the eleventh commandment, and being found out. I have often seen and admired two or three good pictures, but that admiration has dwindled down to something like disgust when I have come to a lot of inferior work by the same hand, plainly suggesting that the good pictures were flukes, or happy accidents, and that the photographer could not distinguish good work from bad. It is quite astonishing to me how so much bad work, even now, finds its way to exhibitions. Photographers who would soon see the mote in the eye of another man's photograph cannot see that there is anything the matter with their own. It is human nature, I suppose, to fancy that our own geese are swans, and it naturally follows that

"Like Katerfelto, with his hair on end
At his own wonders,"

we feel sure the public will be delighted with our apprentice efforts, which to us look so like the work of a master.

There were many things sent to the last exhibition—I saw them amongst the rejected, and, I may add, also on the walls—which showed a very imperfect knowledge of what ought to be offered for exhibition. Yet I must confess that curious inconsistencies sometimes occur. The stone that the mason has refused has been known to become the corner-stone of the building. I once saw a picture placed very high over a door, evidently taken at random from among the rejected to fill a space, which afterwards took a medal at another exhibition. I have also seen the reverse of this. I have known a picture which took medals in several of the most important competitions entirely rejected by the judges at a village exhibition.

It is very difficult to put any limit to the number of pictures to be sent by each exhibitor. I don't mean in the interests of the exhibition so much as of the exhibitor himself. It is possible to get weary even of great excellence. I take an illustration from the last exhibition. There were five large frames sent to show what could be done by a particular maker's camera, and which, therefore, should have been placed among the processes. Each frame contained a large number of small pictures, many of them quite exquisite little gems, all of them good, but so numerous that the eye tired. I was one of the judges, and, therefore, sworn by our inexorable President to study every picture, and I did not feel kindly to the hangers for admitting so many of these advertisements, beautiful though they were, yet the hangers had not hung all of the frames of the same kind sent in by this one exhibitor.

On the frames the exhibition depends for its general effect only second to the pictures they enclose. The harmonious effect of our last exhibition was seriously marred by the inappropriateness of many of the frames, and more especially by those of two conspicuous exhibitors, to which I do not think there would be any impropriety in alluding. There were some foreign pictures, so fine in themselves that they well deserved the place of honour they got, but they were shown in mounts so glaring and vulgar that they seemed almost to defy the hangers to accept them. Opposite to these foreign productions—also honourably placed in a centre, which the pictures well deserved—were some magnificent Yachting Scenes, in a frame that made an eyesore to that side of the room. These prints were mounted in cushion-shaped rims, set in red flock paper—a most disastrous combination. Metal rims always look cheap and common, and are only fit for the sixpenny positives done by our nomadic brethren on the beach; the cushion is the most inartistic of all forms; and nothing could be more damaging to the colour of a silver print than red flock; it is even one degree worse than aniline-dyed plush. Both sets of pictures reached the perfection of their kind, and it was vexing to see artists who could do such good work do themselves so much injustice by their way of showing it.

It is very difficult to give any definite directions about framing. Taste is so wide that it will not be dictated to; but there are some things so positively injurious to the general effect that they should be vetoed. The only thing at present objected to in the prospectus for the exhibition issued by the Council is the Oxford frame. To this might be added all oval frames, black frames, white frames (we had some white frames in the last exhibition), and all glaring and violent coloured mounts; the flocks are especially detestable, and there are some cold, blue-grey mounts, much affected by some exhibitors, which are utterly destructive of harmony. I should be sorry to object to novelty in framing, but I would strongly object to dangerous eccentricity.

It is easy to object, not so easy to suggest; but I will try. In an ideally perfect exhibition all the pictures would be framed in gold, or something that would look sufficiently like it. This is the rule at the

Royal Academy, and at nearly all the principal Exhibitions of Paintings; no card mounts of any kind are allowed inside frames, unless they are gilt. We cannot be so strict here; but we may ask our exhibitors to strive for something like conformity. English gilt frames are no doubt the best when cost is no object; but for purposes of exhibition, I am willing to admit that the German moulding, which has so much improved of late years, is good enough. I would also admit to Photographic Exhibitions light oak or other wood frames, or these frames partially gilt, so as to harmonise with the gilt frames; but I would abolish anything that would make a blot on the walls. I should also like to see the mats, or mounts, inside the frames gilt, or of some delicate warm tint. Crude white does mischief; so does cold grey. There is no necessity for these mounts to be so wide as they sometimes are made. It is not fair to take up the space in an exhibition where space is limited by a display of plain paper.

The above remarks on framing are said on behalf of the exhibition; it will be only just to say a word to the exhibitors on their own behalf. It is useless to deny that considerable damage was done to frames last year which ought not to have been done, and it is hoped that the cause has, to some extent, been discovered, and that it will not occur again; but exhibitors must not expect to have their frames back from an exhibition in all their pristine freshness. A good deal of damage is done at every exhibition, from the Royal Academy downwards. It has been calculated, I do not know with what truth, that the frames that go into the Academy each year come out again with about 2000% of their value taken off them. A few years ago I sent an oil painting in a new frame to a Provincial Exhibition of Paintings. It was returned to me before the opening of the exhibition, because they had so damaged the frame and scratched the picture that it was not fit to exhibit. My advice, therefore, is,—Don't go to too much expense in framing your pictures, but let them be framed decently, and so that they will agree with others.

The back of your frames should demand as much attention as the front. You should be very careful that no nails project. When they arrive it is impossible to avoid stacking the frames together, and if nails project it is as much their nature to scratch as it is that of an angry cat, and damage must happen.

Never send two pictures of the same subject, unless the second picture illustrates a process, and is intended to be hung in the process corner. Nobody wants to see two pictures which differ only in size. However much you may appreciate your pictures you need not send a lot of them. I mention this because I have seen as many as three prints of the same subject hanging in this room at the same time, and in this particular instance they did not vary even in size.

And now I am going to say a few words on that very tender subject—hanging.

The first duty of those who provide an exhibition to which the public are admitted is that it should be sufficiently worth seeing to repay the latter for the trouble and expense of going to see it. To do this, what is worth seeing must be hung in the place where it can be best seen, and the whole show must have a good general effect. The second thought—not the first—must be for the exhibitors, and how to do them justice, if possible, and to do as little injustice as can be helped. That there must be some mistakes is inevitable, and always will be until this becomes a perfect world, when perhaps photography itself will be superseded by something better. Not only must flagrant injustice be avoided, but too strict justice also. A producer of a muddy, out-of-focus, slate-coloured enlargement, could scarcely but feel, when he sees his picture on the line, that he has not only been well hung—but gibbeted.

The difficulties in arranging the pictures increase year by year as new processes are added to our stock. There was a time when the only considerations that arose were, which were the best pictures, and how were they to be fitted together. No regard had to be paid to their colour, as they were all printed alike. Hangers now have to be always on the look-out that prints of different kinds do not get so near together as to murder each other. I have seen a vulgar, large, black-and-white head, printed on pink albumenised paper, utterly destroy a group of most delicately beautiful platinotype prints; and what could be worse to the general effect of a room, as well as to their immediate surroundings, than the cold, faded, slaty grey of bromide prints, especially when of large size? It is getting increasingly difficult to know what to do with such pictures, short of rejecting them altogether, or spoiling the exhibition. It is possible that in time these prints may be improved in colour, then these remarks will not apply.

I think that hangers and judges insist, sometimes, too much on anonymity, and perhaps I may add impartiality, although it requires all my temerity to say this. To begin with, it is impossible to keep up more than the pretence of the anonymous. An expert does not fail to recognise the work of well-known exhibitors, and it is scarcely fair that the

others should not be known also. It is absolutely necessary, if our exhibitions are to be representative, that the names of the exhibitors should be known to the hangers. There can be little doubt that an exhibition depends, apart from its business management, on its general effect and the beauty of the pictures exhibited, but there should be room found for a few pictures which have nothing pictorial nor any novelty of invention to recommend them, and their interest should depend solely on the name of the producer. I will give an instance.

When any man writes or talks a good deal which appears to be very sensible about photography; when he apparently spends a good part of his life in trying every plate and developer that is recommended, with a series of his own modifications to each of them; when he tests everything that he uses even to destruction, and is wildly anxious that his work should be permanent and never die—then it is interesting to see that man's work, that we may be witness to what use he puts his knowledge. In such a case, which is quite supposititious, it is not the beauty of the work which should be considered, but the interest is founded on what sort of work that man produces. An absolutely impartial and just hanger would perhaps turn these interesting works out. But an impartial man is a mere machine.

Here is another case for partiality which I commend. The works of members, always providing they are good enough and not excessive in number, should be preferred to the exhibits of those who only occasionally make use of the Society's exhibition at the cost of a few shillings. Of course, there must be exceptions to this rule, as to all rules. It may happen that an outsider sends in a supremely fine work—then all ideas of rights of the members should be thrown to the winds, and the fine work should have the best place.

Yet another instance of commendable partiality. If an old exhibitor (one who has done much for photography and photographers) sent in presentable work, I confess that I should not only consider the work before me, but I should certainly think of the benefits that man had conferred on the art; and if it could be done without injustice to others I should "be to his faults a little blind," and give his work a rather better place than perhaps it intrinsically deserved. This is another reason for knowing who's who.

Every year there are some complaints about the hanging, and it would be astonishing if in a society of nearly five hundred members a few grumblers could not be found; and sometimes, if we could only forget that no hangers are perfect, they have just cause. But the members have it in their own hands. I have not the authority of the Council for saying so, but I have no doubt that that body would welcome any member of the Society, who has any aptitude for the office, who would volunteer his help in the selection and hanging—and in sharing the blame. I mention blame only because there is never any real praise for hangers, however well they may do their work.

I hear it has been suggested that a real cure for all difficulties would be found in a committee of twenty-five to manage the selection and hanging. This appears to me to be a youthful suggestion, born of inexperience. Two Kings of Brentford might be well enough, but I cannot imagine twenty-five of them smelling at the same rose. It would be as easy to ask for five-and-twenty volunteers as to call spirits from the vasty deep, and as effective. It should be quite understood that the duties of those who undertake to arrange the exhibition do not consist in walking in and out of the room two or three times a-day, and finding fault, and interfering with the real workers. Five minutes of inexperienced advice is scarcely of any real assistance to those who have done the work for years. What is wanted in a hanger is one who can afford to give six or eight hours a-day for several days, and at the end to lengthen his days by stealing a few hours from the night.

To conclude, I should wish to impress on you three things:—To produce every year a few pictures especially for exhibition. To send only a few of your choicest works. To frame them reasonably, so that they may do no mischief to their neighbours or themselves.

Finally, when you find you have not got the best place on the walls, attribute the misfortune to fate, your luck, even want of quality in the pictures—anything rather than to the want of consideration or neglect of those hard-working and much-abused members, the hangers; and if you should find yourself rejected altogether, comfort yourself by thinking that it was all for the best.

H. P. ROBINSON.

CAMERAS, ANCIENT AND MODERN.

[A Communication to the North London Photographic Society.]

In commencing this paper, a reference to the simple camera obscura, invented by Baptiste Porta in 1650, may seem of little interest, but it demands some attention inasmuch as its pictures were admired and

wondered at for nearly 200 years before any successful attempt was made to fix them. History, certainly in the case of cameras, repeats itself, for when the camera obscura was employed for sketching, the inversion of the image was found to be inconvenient, and a plane mirror was fixed at an angle of 45° to rectify this. This arrangement has been over and over again invented for the use of photographers, perhaps on an average once a-year.

Amongst photographic cameras the simple box form is the first to claim our notice, and it is certainly worthy of more attention, especially from those who make or adapt their own apparatus, than is usually accorded to it. For much outdoor work it is all that can be desired; it is perfectly rigid, requires no putting together, and for small sizes is quite as portable as any of the more pretentious modern articles. The camera itself being a plain strong box, answers admirably as a packing case to hold the entire kit, lens, dark slides, and cloth, it can be readily turned on its side for vertical pictures, and I can say from experience, that for seaside work in windy weather it is the handiest of instruments. A slight departure from its primitive simplicity in the shape of a rising front makes it almost perfect. Now for its defects. It can only be used with one lens, and this must have either a rack and pinion or sliding adjustment, and it does not look so scientific as a complicated patent double-acting, reversing frame, swing-back camera, so that people who don't know anything about photography won't think so much of you when you take it out. Still the fact remains that a simple cardboard box covered with leather and fitted with a nine-inch portable symmetrical lens, is in daily use for outdoor work by one of our most ingenious professional photographers, one who has, moreover, invented more than one camera possessing novel and useful points.

The photographic art was not, however, very old when its disciples found out that the plain box camera was not capable of such adjustments as would render it available for universal use. In the first place, only one or at most two lenses of different focal length could be used, and a means of greater range of focus was required for portraits at various distances, not to speak of copying and enlarging. An inner sliding body was therefore introduced, enabling the body to be extended to about one and three-quarter times its original length, and this form has survived to the present day.

This type of camera, though convenient enough for indoor use, soon proved too clumsy and heavy for the landscape artist, and between the years 1850 to 1858, quite a host of portable and folding cameras appeared on the scene.

As most of these are now quite obsolete, I will leave the inquirer after them to seek them at the shops of second-hand dealers and pawnbrokers, and speak of the only two which can be said to have survived till now. The simplest of all portable cameras is one having a flexible bag for a body with suitable frames at back and front to carry the lens and dark slide. This possesses all the advantages of the simple box with the added one of lightness and portability. The well-known Scenograph, which has received the commendation of so distinguished a photographer as Captain Abney, may be taken as a good example of this class.

The other and more important type of portable camera is that now universally known as the bellows body. This at once attained the precedence over all other forms, and has held it up to the present. On and about it everything that photographic ingenuity could do has been done, with the result that such perfect adaptability and precision has been attained, that the modern camera can almost lay claim to be akin with the telescope and microscope, as a genuine scientific instrument, scientific in its construction as well as in its object.

Before proceeding to discuss the details of the modern camera, a glance at the many cameras produced during the long reign of wet collodion may prove of some interest. Then the double dark slide was a rarity, and numerous plans were devised for preparing and developing the plate in the field; for the dry plates of those days, though sometimes satisfactory, were seldom trusted by the operator, who wished to make sure of getting printable negatives. Mr. Scott Archer, the inventor of the collodion process, introduced the earliest of these, and he was speedily followed by a host of others. Some of these were fearful and wonderful in their design. One actually contained material for three dozen half-plates, including spirit lamp, varnish, and even powder colours for tinting the finished pictures. A full-sized tripod made its appearance on turning a knob, and the whole apparatus could be "carried by a lady without attracting attention."

A practical apparatus of this nature was introduced by Dubroni, of Paris, and was for many years sold in London. It consisted of a water-tight chamber with the lens in front, and a suitable receptacle for the plate at the back. The plate was collodionised and placed in position, the lens closed, and the silver bath injected into the camera

itself, and allowed to flow over the plate. When a sufficient period had elapsed the bath was poured off and the plate exposed. An iron developer was next squirted into the camera, and was replaced by changes of clean water; when development was complete the plate was removed and fixed in a separate dish. The inventor did *not* recommend putting hypo in the camera.

The same idea was improved upon by Professor P. Smyth on his journey to the Pyramids. There he used a small metal camera with small ebonite baths with glass sides as dark slides. The plate was collodionised, placed in the bath, and exposed and developed when convenient in the ordinary way. These instruments, although useful for some scientific purposes, failed to find much favour with photographers in general, portable tents being mostly preferred, and we will now pass on to a class of cameras once common but now almost extinct, those designed for stereoscopic work. Opticians still advertise pairs of lenses, but how often is a pair seen in use. In the face of the admirable and suggestive paper which our President has written in this year's BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, it may seem superfluous, nay, almost presumptuous, to say anything of them; but when the subject of cameras is to be dealt with, binocular cameras must not be left out, and even the less generally known single stereo camera with which the name of Latimer Clark has been for so many years connected deserves a word. With this camera a baseboard at least double the width of the body or more is used, and the camera slid from end to end exposing half the plate at the time. This method possesses the great advantage of being capable of giving positives on glass or paper which do not require to be transposed, as in the case of the ordinary binocular stereo camera. The movable central partition used when an ordinary camera is employed for stereoscopic pictures can also be usefully employed in taking single pictures of smaller dimensions. Thus, it may be used for bisecting the plate horizontally as well as vertically, thus giving the power of making panoramic views, while with the stereo division in its normal position two dissimilar views may be taken on the same plate, while the addition of cardboard or tin shields enables an almost indefinite number of subjects to be taken on one plate. Of course it is understood that a revolving or horizontal sliding front is fitted to the camera.

The bellows bodied camera in its modern form comes next, and it will be best at once decide what must be regarded as *desiderata* in what may be termed a general purpose camera. Firstly, and obviously, it must be perfectly light-tight, and some of the cheaper makes do not meet this condition. Secondly, it must be rigid. Thirdly, it must possess considerable power of moving the lens to any part of the front board. And, fourthly, it should possess a range of focus from half to two and a half times, the longest side of the plate intended to be used thus permitting the use of wide angle and long focus lenses.

Some one will now probably ask, Why is the swing back not reckoned as an essential to this? I can simply reply that one of our most experienced outdoor workers makes all his pictures, including many architectural subjects, without ever using a swing back, and no convergence of the lines can be detected. Nevertheless, most workers will find the swing back a very useful addition.

A short description of types of outdoor cameras now principally used may be of some service, and it will be convenient to divide them into classes.

The first we will call the ordinary bellows body camera, a pattern which has, until the last few years, been the favourite for landscape work. In this form of camera the length to which it can be extended is limited, by the fact that the baseboard is single and that it has to be folded up against the focussing screen, thus giving the height of the camera *plus* the depth of the rigid part of the body as the greatest range of focus attainable. Many excellent cameras of this type are now in use and can be rendered available for long focus lenses by the addition of an extension front. Every improvement has been added to this type of camera, but it is now being rapidly superseded by the more modern or long focus camera. The pattern most generally approved is identified with the name of Mr. George Hare, and many of the instruments subsequently issued bear a striking family likeness to it. In this camera a great length is obtained by making a second baseboard travel over the original one, by means of a rack and pinion, the back being hinged on to the fixed baseboard while the front can be clamped on to any part of the moving one. These bolts, or clamps, also provide an excellent side swing to the front, as the arrangement of the back does not allow it to be placed there. This form of camera has one slight defect; the back swings from the bottom edges not from the centre, the theoretically correct position. This necessitates refocussing after the view is arranged on the ground-glass, not a serious trouble, but one to be avoided if possible.

The beautiful cameras of Mr. McKellen, of Manchester, are built on much the same lines, but with several useful modifications. Amongst these may be named a revolving front with the lens placed eccentrically, so that half or quarter-plates may be taken with the help of metal shields, a circular tripod top revolving in the baseboard and a swing front, so that no matter in what position the camera is placed the axis of the lens can be placed opposite the top or bottom edge of the plate. This arrangement is also useful when using wide angle lenses.

Another form of long focus camera is that in which the baseboard instead of having its halves sliding over each other has them arranged as in the old form, one folding over the focussing screen and the other over the lens, a hole being cut for the lens to peep through. This arrangement is very useful for wide angle lenses as there is then no baseboard to cut off the foreground, a defect to which some of the long focus cameras are liable. Cameras of this type have been introduced by Mr. George Smith and Mr. B. J. Edwards.

Besides the foregoing typical cameras, and leaving out the universal or studio form, there have been many cameras introduced for special purposes, all of which it would be impossible to speak of now, but the detective camera demands a little attention. Here the object has been to make the apparatus look as unlike a camera as possible—a book, a brown paper parcel, or a small portmanteau being examples of outer covers. With most of these the ordinary dark slide is used, but in some the plates are supplied from a small changing box as in Marion's Academy camera, or automatically, as in Mr. J. A. Harrison's metallic camera, or the vest camera, which only requires the operator to wear a soup-plate like arrangement under his vest with a lens peering through his button hole.

So far, only the camera itself has been dealt with, but dark slides and changing boxes must now be glanced at. In the earliest camera these were entirely wanting; the camera itself had to be carried into the dark room, the sensitised plate or paper fixed in position, and the whole apparatus replaced on marks which had been made at the time of focussing. The inconvenience of this was soon felt, and we find that Daguerre employed a dark slide opening with hinged doors down the centre. Almost immediately this was superseded by the ordinary single dark slide, which has remained in use almost unaltered to the present time. A few modifications in the shape of draining troughs for wet plates, and various plate carriers capable of adjustment, being nearly all there is to chronicle, although a shutter somewhat on the principle of an iron shop blind ought not to be passed over. The double dark slide is of almost equal antiquity with the single one, and has survived from the calotype days with but little modification, the principal improvement being the introduction of shutters which could be entirely withdrawn from the slide, the aperture being closed by a spring flap lined with velvet. A cheaper form of double slide has a solid frame, and the plates have to be inserted from the front.

With changing boxes there has been far greater variety. In the earliest forms the plate was shifted into the camera itself, an arrangement only suitable for small cameras. The ordinary dark slide naturally came into use with the changing box, and the best type now in use does not differ very much from those made by Ottewill many years ago. The great defect of changing boxes is the liability there is of plates jamming in process of changing, and few of our modern dry plates are sufficiently true to size to entirely avoid the chance of this happening.

It is, perhaps, hardly allowable to class the roller slide or roll holder with changing boxes, although it certainly belongs to the family, and it will be hardly necessary to describe the modern types, as these have been so fully described and illustrated recently, but it may be well to give the history as far as we know it of this piece of apparatus. In the April number of the *Journal of the Photographic Society* for 1856, Mr. A. J. Melnish described a roller slide which he had just then invented. It consisted of a rather thick dark slide, carrying two spools or rollers, from one of which the sensitive paper was wound off to the other as required; a small yellow window in the back allowed the operator to see when a fresh length was in position; a plate of glass in front, and a board pressed against the back of the paper with springs, ensured flatness of the sensitive paper, and completed the arrangement. This idea seems to have been little noticed, probably owing to the fact that for many years paper negatives were quite out of fashion, and it was not till a considerable time afterwards that Mr. Warnerke introduced an improved roller slide, which he designed for use with paper temporarily coated with collodio-bromide emulsion. This slide possessed some very good points, amongst them the revolving shutter, and an ingenious measuring apparatus which denoted by ringing a tiny electric bell when a fresh

surface was in position. Mr. Warnerke's slide stood the test of practical work, and has now, I believe, been adapted to the new gelatine negative papers. Finally the Eastman-Walker slide has come prominently into notice, and seems to have quite fulfilled the promises of its inventors and the expectations of those who have purchased it. Since the introduction of this slide a host of others have appeared, but none seems to differ enough to be mentioned in this paper, which can deal only with types of apparatus.

EDGAR CLIFTON.

ALPHA PAPER.

[A Communication to the Camera Club.]

THE question has been asked, and by a photographer, too, "What in the world is Alpha paper? Is it a curl-paper or a young ladies' journal?" It is neither of these, nor must it be confused in any way with the ingenious clothes-wringer and other articles of commerce blessed with the same arrogant title. It might be explained to some that this title gives no clue to its composition. The name is intended to be understood as that of a photographic printing paper which claims to be registered A 1, or as easy to work as A B C.

It is a rapid printing paper for obtaining positives by artificial light, and is subjected to much the same treatment in development as the argentic bromide papers. But it appears to have important points of difference from these, and, as in working, it shows such remarkable resemblances in behaviour to some of the well-known characteristics of the ordinary albumenised silver prints, it is generally described as a chloro-bromide paper. Others may be able to throw some light on this point.

Its first introduction was in 1884, and in some quarters it was hailed as a boon and a blessing to photographers. In one of the photographic papers it is remarked, "The inauguration of this process may be regarded as being almost as great an era in the history of photography as the introduction of dry plates."

These expectations were not, however, realised, and no further mention of the new material is to be found in the same journal for some years. At that time difficulties in working must have presented themselves, or the popular fancy had not yet been educated to admire photographs in black and white or monochromatic prints in warm colours other than those with a glazed surface. As illustrating the poor favour which it met with at first, many amateurs are still found having in their possession the unused remains of small packets which they purchased in the early days. Latterly, through improvements in manufacture possibly, it has come to the fore again, and for some time there has been a growing revival of interest in it. This meeting of rival enthusiasts is one of the signs of the change. Whether Alpha paper merits the brilliant future anticipated for it in the journalistic allusion already quoted or not, there is a very general opinion held that, on account of colour obtainable, latitude in exposure, sensitiveness to artificial light, and marvellous cheapness, it deserves to be better known and more widely used than at present is the case.

Those who have had experience in the treatment of the ordinary bromide papers will require very few directions or warnings in regard to the use of Alpha paper. An exposure somewhat more protracted is required than with bromide papers; the same cleanliness in the manipulations must be observed; iron development, or, if very careful clearing is attended to, alkaline development may be employed. Next, an immediate application of acid and alum clearing solution, followed by washing, and, if thought necessary, toning in a gold or gold and platinum bath, then the usual fixation, varied in length of time in certain cases, according to the colour, warm or cold, required; and, finally, a thorough washing in several changes of water.

In regard to developers, the formula given with the paper works exceedingly well, but as oxalate of potash and sulphate of iron are generally kept in saturated solutions, directions should be given simply to make the required formula from these stock solutions instead of putting each operator to the trouble of making the necessary calculations for himself. For the sake of any who have their oxalate and iron in saturated solutions and may wish to be spared the trouble of mixing a special developer, the following directions may be given:—

- | | | |
|----|---|------------------------|
| | { Saturated solution oxalate of potash | 2 ounces. |
| 1. | { A ten per cent. solution of bromide of ammonium | 60 to 180 drops. |
| | { Water | $\frac{1}{2}$ ounce. |
| 2. | { Saturated solution sulphate of iron | $\frac{1}{2}$ ounce. |
| | { Citric acid | 10 grains. |
| | { Water | $3\frac{1}{2}$ ounces. |

For development, take equal parts of each; the iron *must* be added to the oxalate. If larger quantities are required, of course multiples of the above must be taken. The bromide must be varied to suit circumstances. The citric acid can be put in by guesswork.

This developer is weak and well restrained, and the object of this is to make more certain of producing a warm colour in development, and thus to avoid the somewhat unpleasant greenish colour apparently given by some negatives under a short exposure and stronger development.

A clearing solution may be made by taking from ten to twelve ounces saturated solution of alum, adding ten ounces water and a quarter ounce of citric acid.

After washing, a toning bath, if one be required, may be used. That recommended in the directions with the paper, any acetate bath, or a bicarbonate, are found to work equally well, but more chloride of gold will be found to be required than in toning ordinary silver paper. But in many cases toning can be dispensed with.

The fixing bath should be hypo one to four, used fresh. If much stronger than this blisters appear. The toning and hypo baths are used mixed by some workers. The results are much the same.

Very good prints again have been obtained by the use of pyropotash, pyro-soda, and pyro-ammonia developers somewhat weaker than as used for plates, and with a large quantity of sulphite of soda or citric acid. With these developers clearing solution should not be stinted. Stains which five or ten minutes in the acid and alum fail to remove will sometimes disappear if the print is left in for a much greater length of time, and the picture seems in no way to suffer.

Others may have tried hydrokinone and other forms of development. Their experience will be interesting.

But by far the most important feature about Alpha paper, and the most interesting subject to treat of, is the variation obtainable in regard to colour. Warm colours are to be secured by using other well-known printing papers. Platinotype of a special kind gives a beautiful brown tint. Bromide paper by special treatment will give a colour approaching sepia, and nothing can exceed in range and variation the colours which antotype yields; but it is a distant gain to be able to secure a similar result upon a paper which can be printed by artificial light, and which can be obtained at a cost below that of ordinary silver paper.

The power to vary the colour of a print from any particular negative is held to be of great service. Without going the length of asserting, as has been suggested, that the cold, grey colour should be kept for cold or wintry scenes, and that prints in warm monochrome should be used for summer sunny scenes, still there can be little doubt that much can be done by a judicious suiting of colour to subject. There are certain fine enlargements of sea and shore waves done in shades of green—well known to most photographers. This treatment is felt as yielding a not unpleasant effect. To apply the same to portraiture would, perhaps, hardly give the same satisfaction.

There has been a rush for black and white in late years, and we have even been told that the warm colours of ordinary silver paper are held to be most objectionable by artists and men of cultivated taste. If not too assertive, the simple answer is to say that this is a mistake which a wider experience, better judgment, or closer observation—in fact, a more cultivated taste itself—would have obviated. No doubt, the glaze of silver prints is felt to be fatal to artistic quality, and there is also a widely-spread feeling of approval, and a newly discovered feeling of delight in the public mind at having its portraits so like engravings; but, as regards colours, a glance at any gallery of etchings and engravings will indicate the feelings amongst artists, and afford illustrations of lovely pictorial effects enhanced by a rendering in warm monochrome.

Practically, in the treatment of Alpha paper, it may be briefly formulated that a short exposure with normal or strong development will yield grey prints, or, more frequently, prints of an unsatisfactory greenish shade; whilst long timing (we will, in spite of objectors, call it "over exposure") will give, with restrained development, prints in warmer colours.

Upon the negative used much of the colour or the particular shade of red, brown, or purple, depends, just as in a silver print. Some will give a pinkish purple, others a mahogany red, and some negatives are much more disposed to yield the warm colours than others. It is difficult to arrive at any certainty that the use of different kinds of light—daylight, magnesium, or gas—has any distinctive effects upon colour. Nor is it seen that there is any decided or regular modification by the employment of an alkaline developer in place of iron.

It is by variations in the length of exposure and strengthening or weakening development that the great range between cold grey or bronze green and red or brown is obtained. The changes which can

be effected by treatment in the toning and hypo baths seem to depend very greatly upon the colour of the print as it leaves the developer. Those showing the objectionable greenish colour are, in my experience, the most difficult to deal with. By very strong toning and long fixation some of this can be removed, but it changes to a rather cold, bluish colour. A print developed to a red or brown gives no trouble. It can be fixed direct without gold toning, and will retain its warmth, or, if toned and then fixed, it will give any colour from the original tint through to grey.

There is, in my opinion, but one thing to do, and that is to give rather long exposures, and weaken the development. The latitude is very great, but experience with different negatives must teach the best length of time to give. If greatly over exposed, the red colour in the print is obtained at a sacrifice of brilliancy; but by a judicious use of bromide and dilution much can be done to avoid green, and to secure warmth without flatness.

The hypo bath is an important agent in producing changes of colour, as well as in brightening up the pictures. Its action does not, however, seem to be regular. Sometimes, by prolonged fixation, it will appear to remove the green colour from a print which has not been toned; at others, even an all night sitting will have no effect at all. To take the print from the hypo, treat it in the acid bath, and then return it to the hypo, has been found to change the green to a brown, but whether this would always happen I am unable to say. Other treatments have been tried. Intensification with mercuric chloride and sulphite of soda effectually removes green from an untuned print, and changes it to a very pleasant brown; but, unfortunately, grave doubts are entertained as to the permanency of such pictures.

All these different treatments are exemplified in the prints handed round. Most are simply intended to show the general quality of results to be obtained by the use of Alpha paper; some, as will be seen from the notes appended, are illustrative of the effects produced by the use of different developers, by varying the exposure, altering the light, and the other experiments already referred to. In the preparation of some of those experimental prints Mr. Seyton Scott has given very kind assistance.

In conclusion, Alpha paper is certainly worthy of trial and discussion. In addition to its own special advantages in regard to colour and cost, it is sure to commend itself to amateurs on account of its suitability for printing at evening, and for enlarging work.

There ought to be no lack of discussion upon such a subject. It is known that some here have been devotedly engaged in experimenting upon the paper, that they have made important discoveries, and have been nursing until now secrets in regard to it.

In treating of this matter an unlimited number of questions are opened up, some of practical working for Alpha-philés, and others involving subtle points for the speculative and the scientific. Our confirmed materialists will rush in with some horribly convincing physiological explanation as to exactly how and why works of art give us pleasure, or excite what is called our imagination, and we shall learn from our rising and scientific young men why a difference in colour or other quality in our negatives, or the light or heat they are printed in, yields such variations in the resulting impressions; why long exposure and restrained development set up such changes in the constitution of the image as to impart the appearance of redness to it; why and how fixing gives an additional sulphur toning; and the interesting why and wherefore in regard to many other points which those of us who fancy we have a call to art are very much in the habit of "never minding."

G. DAVISON.

NINE YEARS A TENT PHOTOGRAPHER.

ONCE upon a time I looked into a photographer's garret and there saw at least half a bushel of un-called-for photographs. There were babes and children, young men and their girls, old men and women. How many hard and weary hours of pesing, developing, printing, toning, and mounting, a photographer alone can tell.

These pictures tell me that that photographer was too good of heart, so he let the vulgar crowd—and here they were stowed away in a box—take advantage of him. It made me mad to think of it, and I propose to tell the craft how I have kept even with such people.

In the first place I required part payment when the negative was taken, but sometimes it happened that they would be in in half an hour, or they had no small change, or something or other would happen. Well, all photographers know that the photographs on which no deposit was paid are the ones about which trouble arises. Whenever I had pictures un-called for in a reasonable time I put them in my show-cases, turning them *upside down*. Upon being displayed thus, people would say, "Well! well! what's the matter with him? deadhead I guess;" and one would

say, "His pictures are not called for yet." It almost always had the desired effect, and they either called or sent for their pictures.

I tented nine years alone, having neither partner nor hired man. Nearly five years were spent in Arizona, and I often wondered that I was not held up and robbed. Once I lost a garment. I had travelled two long days by wagon over the dusty alkali plains and was camped on the San Francisco River at a copper mining camp at Clifton. Half of the men you saw carried "guns" (immense pistols) around their waists. I saw a man shoot through the rim of a drunk's hat to see how close he could come to his head without hitting him. Times were rough then.

The nights in Arizona in summer are generally levelly; so warm that you are comfortable in your shirt sleeves to sleep on the top of a house or on your cot out of doors. One night, being quite tired out, I took off my pants and left them just inside the tent under the skylight, which was open. The moon shone clear and bright. I slept on my blanket on the operating carpet, with my pistol under my head. There was a big dance in town that night, and I presume some rascal opened the side door, it being only tied with a string, and stole my pants. They did not contain much money, for I always hid my cash in the ground, but my watch, keys, &c. Fortunately I found a pair of overalls in the morning, so that I did not have to go out like a Yuma buck. I put my pistol up on the dark room shelf afterwards, and never had occasion to use it.

I was once camped in a little town on the Gila, Arizona. There was but one American young lady in the place, and of course all the boys were in love with her. I took five dozen cabinets of that young lady, for which the boys paid. There were dark-eyed señoritas, but they could not shine alongside the American girl.

Then I moved to a Mormon town, where I was treated very kindly, and well patronised; but it seemed heartless, cruel, hard, to see one of the leading men come one day with a wife and half a dozen children, and next day bring in another wife with another lot of children to be photographed. The passage of Scripture "increase and multiply" is the one they seem most to practise. Seems to me if they would pursue quality, instead of quantity, it would be better for humanity. Not that the Mormon children are dull; they seem like the world's children everywhere, bright and happy. The community I visited lived upon the German plan, in a community, and had their farming land at a distance. I boarded while there with a leading man who came across the plains with Brigham Young. He had two wives; they often came in my tent together. I asked them closely about their belief in polygamy. They seemed to think it was the only right way, and got along well together, living at either end of the same house—which was divided by a partition—as nicely as two church mice. But the first wife, the most refined of the two, wore upon her face in repose a sad, heart-broken look, in which my long practised photographic eye read, "there's a story untold."

I thank men for telegraphs and telephones, for railroads and newspapers, for in them I see the glimmer of the good time coming when creeds shall perish from off the earth, and knowledge and truth shall be sought everywhere.

E. A. BONINE, Los Angeles.

—Anthony's Photographic Bulletin.

PHOTOGRAPHING AT NIAGARA FALLS.

[A Communication to the Photographic Society of Philadelphia.]

SINCE the opening of the State Reservation, and the consequent demolition of the unsightly mills and buildings that formerly marred the beauty and grandeur of the place, many views, hitherto inaccessible, have been opened up. Primitive simplicity, unaided by art, is now one of the great features of Niagara, and one thoroughly appreciated by the lovers of the picturesque; another feature of the Reservation being the almost entire freedom from "fees," and the annoying solicitations of hackmen and guides.

Those familiar with the geography of the Niagara River are aware that the falls face the north and the north-east, consequently a large proportion of the views must, of necessity, be made against the light. This fact, of itself, renders the photographing of the swiftly-rushing waters an unusually difficult task. The best time of the year is undoubtedly in the month of June, when the early foliage is at its prime, and before the excursion season has fairly opened. I speak from experience on this point, having suffered from the annoyance of unwelcome "figure compositions" suddenly presenting themselves in the field of view.

At that season, the sun being in its most northerly position, the light upon the falls is at its best. Ordinarily, a bright sun is best adapted for general work, although it must be remembered that, in views of the rapids, especially from the American side, an overcast day will give much the softest results. This, I may say, is true of any view in which there are harsh contrasts.

Two great enemies of the photographer at Niagara are wind and spray. While the former holds away it is useless to attempt any work. The latter is by no means a constant quantity, and successful views of the falls proper can only be made when it is at its minimum. Attempts to render what appear to be fine spray effects result only in hopeless fog. My experience has been that it is far preferable for the casual visitor, having but a limited time at his disposal, to eschew the difficult subjects, unless under the most favourable circumstances, and confine operations

to views readily attainable, and such "bits" of picturesque scenery as may strike his fancy.

Photographing the falls from below is attended with so much risk and discomfort that even the most ardent amateur may be excused from making the attempt; especially is this the case when the results obtained, even under the most favourable circumstances, are not commensurate with the time and labour expended. I have been informed by some of the resident photographers that, during the year, there are indeed very few days on which really good pictures of the falls from below can be made. It is useless to attempt photography at Niagara without an exposing shutter capable of giving exposures from one-tenth to one-hundredth of a second, my own experience being that with very rapid plates the best results were obtained by using as large an aperture as was consistent with fair marginal definition, and as rapid an exposure as any shutter would produce. I am convinced that a larger amount of detail is obtained in this way than where a slower exposure is made with a smaller stop. The extreme darkness of the foliage about the falls is such as to render the developing of very much detail almost an impossibility, especially so when contrasted with the brightly illuminated water. Plates showing a decided tendency to "softness" will, therefore, give better results. In order to proceed systematically, the photographer should commence in Prospect Park as early in the morning as possible, and gradually work around over Goat and Luna Islands, finishing with the Sister Islands about noon.

Views from the Canadian side are best made in the afternoon. I may remark here that neither the American nor Canadian customs officers stationed at the new suspension bridge make any objections to photographic apparatus, unless, however, the enthusiastic operator is sacrilegiously inclined and desires to profane the Dominion Sabbath, then the "blue-nose" official will doubtless interfere. The virtuous Canadians evidently draw the line at photographing on Sunday. On clear days, when the falls are comparatively free from spray, some very fine effects are to be had from a point near where formerly stood Table Rock. From a point on Clark's Island, about three-quarters of a mile above the Horseshoe Falls, a fine view of the Canadian rapids can be made. Late in the afternoon, when the shadows fall obliquely, the effect of the turbulent water is superb. For views of this character it will be necessary to increase the speed of the shutter considerably, otherwise the swiftly-moving water in the foreground will be so much blurred as to spoil the general harmony of the result.

To one fond of engineering subjects, the cantilever bridge of the Michigan Central Railway will prove both pleasing and interesting, the best point from which to make it being what is known as the "Old Maid of the Mist" landing, about half a mile above, and reached by a good road down the bluff. The walk along the bluff below the town of Niagara Falls, after passing the mills, is picturesque in the extreme, and affords some excellent subjects. I did not attempt any photographs of the Whirlpool Rapids, and, therefore, cannot say when and how the best views are to be made. From casual examination, however, I should say that the Canadian side, after about one o'clock in the afternoon, would offer the most advantages. Having thus, in a general way, given some idea of the photographic work to be made about the falls, I must say that, in a field so rich and varied, it is impossible to establish any given route or class of subjects; let the results proclaim at once the individuality of the artist.

The government breakwater, at the mouth of Buffalo Creek, offers favourable opportunities for instantaneous views of the lake marine. To those who may be interested in technical points, I will say that the pictures exhibited were all made with a Ross' rapid symmetrical lens of seven and a half inch focus, using an aperture of $\frac{1}{8}$. The shutter used was one of my own construction.

CHARLES R. PANCOAST.

THE HUMOROUS SIDE OF PHOTOGRAPHY.

[A Communication to the Birmingham Photographic Society.]

SOME few words are needed to-night by way of introduction, though I promise you they shall be short. Some lectures you know are instructive, others amusing, and there are those of a hybrid character which combine instruction with amusement; the latter have a "fine old crusted" tone about them, but I promise you that mine will fulfil all the requirements of that phrase, at all events you may take it from me that I have made no efforts but to amuse you. Possibly, there may be found some instruction lurking here and there, which you may be able to find out.

Some time back, when, as a member of the Lantern Committee, I came here prepared to do my share, several members asked me if "my paper" was ready. I replied in the negative, as I had only some lantern slides to show, but promised the paper, which I now shall read to you, with illustrations.

You may ask me why I deem amusement a suitable subject for a paper before this august and sedate Society. Well, I have an object. The affairs of a scientific society like ours may be conducted in too melancholy a tone, too humdrum, in fact. I do not say that we suffer on that score, but I do say a little humour, a few pleasantries thrown into our meetings from time to time, will draw members closer together, and dissi-

pate that awfully cold state of reserve that many of our members suffer from. One or two of the meetings have reminded me somewhat of a "Burial Club" met to bewail the loss of a member, and to vote, as cheerfully as the mournful subject will allow, the worldly gold for his decent interment. Mind you, I am only giving you my own opinion, and I'll take all the credit for it, but don't want any blame. True, all our meetings are not like this, for we have several unconscious humorists in our midst. Take, for example, the one who spoke of the dread his entertained of the difficulty of preparing a paper to read before the members. "But, bless you!" he added, after he had the paper finished, he found "there was nothing in it." There was no vote taken on the question. And then don't forget the exciting episodes of demonstration when a member says something like this, "You see it develops very quickly," and then finds something has gone wrong, and it's not developing at all. But I agree with Artemus Ward when he says, "I think, don't you know, an occasional joke improves a comic paper;" so even if we have humorists among us, there is still room for an occasional joke.

Then there are the outdoor excursions. What about that grand piece of apparatus yecept "Ye Society's Changing Bag," which fogged so many plates at Dovedale? and the incident whers a member dropped a lot of exposed plates into the river? Isn't that humour? Not exactly dry humour, though, although some people recommend soaking the plates before development. As regards the excursions and where to go, one has to *Pickard* (pick hard) among those on the list for a *Holiday*, it would be *Skarleesly* possible to be better arranged; it is a *Delicate* question, but still I must not *Birkett* (burke it). The expenses might be kept down by going to some place where drinks might be obtained at the *Pumphrey* (pump free) of cost, though many would not care a *Button* about that; still on a broiling day with a fairish *Heaton* (heat on), it doesn't do to be too *Cox-y* about the matter. Then there is the old villager who tells you "Harry's son (*Harrison*) will carry your luggage, and I'll show you the way as *Bliff* (I live) close by." Give him a three-penny bit, and tell him not to *Lewis* (lose) it.

I intend to-night to speak on the humorous side of photography in three heads—two sub-heads and a lins in small capitals. There are incidents with the camera in the field, at home, and lantern work. The majority of my points I shall be able to illustrate by the aid of the lantern.

Those amateurs who have knocked about the county-side as I have, both as an amateur and professionally, must have come across many things the remembrance of which even now produces a grin. The various pictures I show you to-night are not given as first-class examples, nor do I deem them anything but commonplace, everyday occurrences, but they will serve to illustrate the purpose of my paper, which is to show, in spite of all the attendant difficulties, the failures, and hard work, even with successful efforts, amateur photography gives more fun and unexpected amusements than any other of the recreations adopted by the average man. Take, for instance, at the side of a stream, with bridges few and far between. You want to be on the other side, and cannot get there without two or three miles walk. It is no use to sit down and sing, "Oh, what must it be to be there!" I'll show you how it was done by our worthy Secretary—by means of a cottager's ladder and crawling across! You don't see Mr. Karleese, but there is an umbrella; and most great men are known by their appurtenances—one by an eye-glass, another by a collar, and so on, even down to our Secretary with his umbrella. In your rambles have you ever come across the county yokel "Who'll smash the whole blooming consarn if you don't take his picter." Here he is; according to the official and authorised version of the interview, he would have done it, too! Then here is "A Horse Slaughterer's" business-card.

It is not my intention to pursue any plan of campaign to-night, but, like the busy bee, to wander from flower to flower, and collar all the pictures I can. This is not the original text, but it "kinder fits in well." The seaside affords splendid chances for humorous pictures, as far as the sands go. At Rhyl last year, in two and a half days Mr. Taylor and self secured some fifty pictures, not having a roller slide, and having to change in the pantry amongst the beef, mutton, dripping, and black-beetles; still we were satisfied with the results, and you will see by the pictures, *Under Difficulties, Group of Donkeys, Paddling, Sea Urchin, On the Sands, A Penny a Swing, Real Jam, Buried Beauties*, that we let nothing hinder us.

People will get in the way sometimes. Once at Hexham four men persisted in getting in my way. They wanted to be taken in the picture, they said. I advised them to go on the bridge, as they would be better taken in there. Now where that cross is on the bridge the four heads are there—mere black dots. I don't expect you can see them, but I consider they were taken in.

Possibly some of our members are cyclists: here are a few pictures. *Nap on Wheels*—observe the joyous expression of the man with nap hand; *Beat that if you can*, a grand idea, a magnificent conception, spoilt by a large boot, the card on the ground, being the interesting point, all spoilt by a boot No. 13 size. *The Odd Man out, The Stocks, The Sleeping Beauty, The Smoker's only Match, The Cow and Quirk's the Word, Gossip*, &c. At Kenilworth, the other day, we had a circus performance; then, again, I was trying to get some scenes of amateur theatricals. The day was dull, and the stage dark and gloomy; however,

with three minutes' exposure, I secured some sort of result. Whilst taking it one lady got up and walked off the stage; the military gentleman next her asked if it made any matter. "Oh, no! tell her to come back again." A little time after the same lady, looking at the photograph, said she seemed hazy, and I replied, "I was afraid she had moved."

New I come to photography at home. Here is *Background*, nothing but real old English "tubs" and buckets; *Teep tite still*, the baby photographer; *Impudence, Parrels Post, The Doll Family*, &c.

And now we come to the lantern as a humorist. There is very often much impromptu fun at a lantern show, owing to slides being put in upside down. That is quite a common occurrence; and when the slides of different members are put through—various sizes and shapes and remounted, with no directions how they are to be put in—fine fun is caused for every one but the operator, who hears on all sides the shout, "It's the wrong way round." I show you some twenty illustrations of what may be termed tricks with the lantern; but they are very effective for home entertainment, and the subject is capable of wide extension. This will conclude my remarks on this point—the lantern as a humorist, and will finish my paper by exhibiting the remainder of the slides I have selected for the *Humorous Side of Photography*. J. W. WELFORD.

THE THEORY OF DEVELOPMENT.

[A Communication to the Cardiff Amateur Photographic Society.]

By development of a plate, one understands the continuation and intensification of an action commenced by light. When a plate is exposed in a camera the bromide and other salts of silver are so acted upon by light as to set up an incipient state of decomposition, that is, the light seems to weaken the affinity between the bromide and the silver. I have mentioned only bromide, but the same remarks apply also to the chloride and iodide, so that when the developer is poured on the plate the separation of the two elements (silver and bromine) in the parts which have been exposed to light is effected long before the rest of the plate. It must not be forgotten that the whole of the plate is similarly affected by the developer, whether it has been exposed to light or not, and that it is only the difference in time between the blackening of the exposed and unexposed parts that makes development at all a possibility. This is a point that many amateurs would do well to bear in mind.

By a developer we mean any chemical or chemicals which have the power to reduce silver salts. These are known to chemists as reducing agents, and they are so called because all developers or reducing agents have one great property in common. They have all a great affinity for oxygen, and it is this property which enables them to reduce silver salts, and thus develop the picture. All the pyro developers in common use (for dry plates) may be considered on four legs, or to be composed of four principal parts, namely:—1. The reducing agent; 2. The corrective; 3. The alkali; 4. The preservative; all rendered active by being dissolved in the diluent water. I have a few words to say about each of these parts and will try to answer intelligently the following questions:—1. What is the use of the reducing agent? 2. What is the use of the retarding or checking agent? 3. What is the use of the alkali? 4. What is the use of the preservative? 5. What is the use of the diluent water?

1. The reducing agent has the power to separate the silver from the bromine, chlorine, and iodine, or whatever other element or elements it may be combined with. This it does by combining with the oxygen of the water contained in the developer, thus liberating hydrogen which combines with the bromine, iodine, &c., and leaves metallic silver in the form of a black powder. This black powder is the high light of the pictures. The substances generally used as developers are pyrogallol acid, hydroquinone, and oxalate of iron, although many other substances could be used. A very interesting experiment is to add a little of each substance to a solution of nitrate of silver in water, and observe the different effects.

2. The retarding or checking agent. For this purpose some bromide is used, generally the bromide of potash, ammonia, or soda. This acts by forming a loose compound with the silver salts, which is much less susceptible to the action of developing (or reducing) agents than the silver salts are alone. The bromide, therefore, protects the silver salts from the developer, and thus checks the progress of development.

3. The alkali is a necessary constituent of all pyro developers. The alkalies used are usually ammonia or the carbonates of potash and soda. I should think that the carbonate of ammonia, or the hydrates of potash or soda, would also serve for this purpose. If you try to develop a plate without adding ammonia, potash, or soda, you will find that it will be a failure. Suppose you put a solution of pyro, made acid with citric or nitric acid, on a plate, you will find that no action takes place, at least not for a long time. If you now add a little ammonia, potash, or soda, you will find that the development commences at once, and the more ammonia, potash, or soda you add, the quicker the development will take place. Chemists express these facts by stating that pyrogallol acid is active in an alkaline medium.

The ferrous-oxalate developer is, however, different. If you add an alkali to that, you will make a mess of it. That is active in an acid

medium. You know that the ferrous-oxalate developer is composed of proto-sulphate of iron (ferrous sulphate) and oxalate of potash. Ferrous sulphate alone might be used, but it is not nearly so energetic as the oxalate of iron, which is formed by double decomposition between the oxalate of potash and sulphate of iron. If you take two solutions of nitrate of silver, and add to one of them a solution of ferrous sulphate, and to the other the usual ferrous-oxalate developer, you will see that the sulphate of iron takes longer to blacken the silver (that is, to precipitate the silver) than the ferrous-oxalate developer.

4. The preservative. All the developers are very unstable compounds, because they are so susceptible to oxidation. When they are dissolved in water they require something to protect them. In the case of pyrogallie acid, citric or nitric acid is used. I have said before that pyro is most active in alkaline solution. The acid is therefore added to counteract the oxidising tendency.

The ferrous-oxalate developer is usually protected by floating castor oil, or refined paraffine oil on the surface of it, and drawing off the solution with a tap or syphon. Hypophosphorus acid or hypophosphite of soda may be added (about one or two drachms to a pint), and will also keep the developer.

5. The water used. It is always the safest plan to use distilled water; but as a matter of fact I have never heard of failures through using good clean tap water.

Having endeavoured to answer the questions I set myself, I think it would be a great step in advance if photographers would try and mix their developers and select their chemicals in a more intelligent manner—not to follow the books so closely, but to ascertain why this, that, and the other chemicals are used, and in what manner they act, and to regulate their mixing accordingly; in fact, the thing to be arrived at is to see scientifically with one eye and artistically with the other.

JESSE WILLIAMS.

ON A METHOD OF MOUNTING ALBUMEN PRINTS ON ANY KIND OF PAPER.

THE impossibility of mounting albumen prints on note paper or printers' paper with the ordinary materials, is perfectly understood by all photographers. Books cannot be illustrated by albumen prints without the employment of cardboard, nor can the amateur paste his production in a letter without encountering an amount of crumpling and cockling which destroys alike the appearance of letter and photograph. An attempt has been made to obviate this difficulty by the use of gelatine dissolved in the smallest possible quantity of water, but the formula of Mr. G. W. Simpson did not in my hands yield satisfactory results. After making one or two experiments in other directions, the object being to avoid the use of water altogether, I found that a thick solution of bleached shellac in alcohol answered every requirement for any kind of paper likely to be used, as well as for cardboard, the mounted prints being perfectly flat and firmly attached. My general practice is to roll up the damp prints, as they come from the washing trays, in little bundles with the albumen face outwards, and allow them to dry spontaneously; each bundle is rolled in a sheet of note or foolscap paper. When the prints are dry they are flattened and placed in a book or portfolio, and are then ready to be trimmed. After this operation the thick shellac is applied and they are mounted in the usual way, the only precaution being that the shellac must not be allowed to get on the face of the print, as there is no means of removing it; for if alcohol be applied, it penetrates the paper and dilutes the varnish, which then makes its appearance on the face of the print in spots. The prints are kept under moderate pressure till dry. The varnish allows a certain amount of adjustment on the mount, quite enough leeway for one accustomed to such operations.

The prints by this means are very firmly attached to the paper; there is no possibility of any injurious reaction taking place between the varnish and the albumen film, for they never come in contact; the print is protected at its back by the most durable varnish with which we are acquainted, and it lies flat. At present I know of only one drawback to the process proposed; if it is desired to remove a print from its mount, of course alcohol must be employed instead of water.

Prints mounted on note paper, printers' paper, and cardboard accompany this communication.

[The specimens sent by Professor Rood are remarkably good, and free from curl and cockling.—Eds. of *Anthony's Bulletin*.]

—*Anthony's Bulletin*.

PROF. O. N. ROOD.

Department for Inexperienced Photographers.

WHAT IS THE USE OF A DIAPHRAGM IN A LENS?

THE diaphragm, often designated the stop, is an opaque plate having in it an aperture of smaller dimensions than the lens. Its function consists in debarring the transmission of all light except what passes through it, and by its position it can compel one or another portion of the lens to be instrumental in forming the image in the camera. The best part of the lens is, therefore, by its agency brought into use.

The diaphragm is employed for a twofold purpose: it flattens the field by rendering the margin of the picture sharp at the same time that the centre is in good focus, and it gives depth of definition by rendering objects reasonably sharp, whether such objects are situated near to the camera or at a great distance. These advantages are obtained at the expense of illumination. The smaller the diaphragm is, the greater will be the depth or penetration obtained.

To illustrate these uses: let the camera be directed towards a wall, row of houses, or a landscape, and focus the centre without making use of a diaphragm, or, if any, the largest one belonging to the lens. Examine the image on the ground-glass by a magnifier, and it will be found that the sharpness by which the centre is characterised is confined to a more or less limited area beyond which indistinctness prevails. Now insert diaphragms in succession each smaller than the other, and the area of sharpness increases until it embraces the whole of the plate.

The use of the diaphragm in conferring depth or penetration may be shown by arranging a group in front of the camera in such a manner as that some shall be nearer than others. Focus the nearest figure sharply, and in most cases it will be found that all the others situated behind this one will be indistinct and out of focus. By proceeding as before directed, that is, inserting one diaphragm after another in succession, eventually one will be found which will bring the nearest and most distant figure into sharpness simultaneously. This applies equally to landscapes as to figures, and indicates the method by which distant hills and objects in the foreground are rendered equally sharp.

We do not here imply that it is always advisable, or in good taste, to make the distance extremely sharp, for, on the contrary, it is frequently desirable that it should be subordinate to the leading theme in the composition so far as regards sharpness.

In a single achromatic lens the stop must be placed next to the flat or concave side, and, with one exception, to the outside of the lens. This exception is in the case of the lens being of an extremely deep meniscus form, when it is often better that the convex surface shall be directed towards the subject. A practical outcome of this will be found in the case of a wide angle compound, from which it is desired to remove one of the lenses in order to obtain a longer focus, when the back lens may be removed, leaving the front lens alone in its place. But a single trial will determine whether this is the better position with any given combination.

In a rapid combination the position for the diaphragm is about midway between the lenses; yet it is sometimes attended with advantage that its position be shifted a little nearer to the front. We may here observe that according to the position of the diaphragm in such lenses, so will be the flatness of the field on the one hand and the production of or freedom from linear distortion on the other. With portrait combinations the flattest field is obtained when the diaphragm is near the front lens.

In single landscape lenses it is well to have the diaphragm at the maximum distance from the lens—this ensures flatness; but it is also well to have the power of bringing it close to the lens in order to minimise distortion when taking architectural subjects.

The shape of the aperture should invariably be circular.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 4586.—“A New or Improved Holder for Photographic Plates.” E. H. WHITE.—*Dated March 28, 1887.*

PATENTS COMPLETED.

A NEW OR IMPROVED PROCESS FOR PREPARING THE NEGATIVES REQUIRED FOR REPRODUCING PHOTOGRAPHS IN COPPERPLATE, LITHOGRAPHIC, OR PRINTING PRESSES.

No. 5596. LORENTZ ALBERT GROTH, K.G.V., 30, Finsbury-pavement, London, E.C.—*April 22, 1886.*

HERETOFORE it has been impossible to reproduce photographs in printing machines because of their smooth surfaces. The object of this invention is to give them a suitable irregular surface by means of specially prepared negatives.

In our Patent, No. 5595, dated same date, for reproducing photographs in copperplate, lithographic, or printing presses, I have already described one method of preparing the negatives, namely, by rubbing powdered oxide of zinc or oxide of bismuth over the surface of specially prepared pigment paper. They can, however, be prepared in different ways all leading to the same result, of which the following is one:—

On a level surface painted black or white is fastened by means of glue, grains of wheat, rye, lentils, beans, rice, barley, sand, or any suchlike material, from which plate a very reduced photograph is taken which represents a more or less irregular surface called a “corn surface,” by means of which a negative is obtained.

With this corn negative in conjunction with the half tone a corn negative is obtained from which the blocks or plates are prepared.

Instead of using the surface covered with grain, &c., a design by hand or with the guillochir machine may be used.

The same result may be obtained from a copper or glass plate ground or roughed by a sandblast machine, inked as for copperplate printing, from which a few good copies may be taken on vegetable or prepared paper, and from which a negative can be taken by means of which corn negatives from half tone originals can be produced.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—A new method of preparing the negatives required for reproducing photographs in copperplate, lithographic, or printing presses, consisting in fastening on a smooth level surface grains of wheat, rye, lentils, beans, rice, barley, sand, or other suitable material, or a design suitable for the purpose, and from which plate a photograph on a very reduced scale is taken having a corn surface, by means of which, in conjunction with half tone originals, corn negatives can be produced, substantially as hereinbefore described.

A NEW OR IMPROVED PROCESS FOR PREPARING THE NEGATIVES REQUIRED FOR REPRODUCING PHOTOGRAPHS IN COPPERPLATE, LITHOGRAPHIC, OR PRINTING PRESSES.

No. 5654. LORENTZ ALBERT GROTH, K.G.V., 30, Finsbury-pavement, London, E.C.—April 24, 1886.

THIS invention is a modification of those already filed by us on the 22nd day of April, 1886, Nos. 5595 and 5596, the object of which is to prepare the necessary negatives for reproducing photographs in copperplate, lithographic, or printing presses.

The operation is as follows:—

A plate or cylinder of copper or steel coated with asphalt or other thin plastic substance, in conjunction with a corn or irregular surfaced negative (as described in my former applications), is exposed to the light and developed in the usual way, and then etched by perchloride of iron acid or by means of electricity.

An uncoloured transfer paper prepared with chalk is then strongly pressed against the plate or cylinder, so that the raised parts are perfectly impressed into the transfer paper.

By means of a negative pressed against this transfer paper and exposed to the light a copy with a corn or irregular surface is produced as described in our Patent, 5595, which, after being touched up (if necessary) with lithographic chalk, can be transferred direct to the stone or zinc, or a negative may be taken which can be used as a medium for making the plates in the usual way.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—The preparation of negatives for reproducing photographs in copperplate, lithographic, or printing presses, consisting in preparing plates or cylinders with peculiar corn or irregular surfaces on which an uncoloured transfer paper prepared with chalk is pressed, the impressed copy of which in conjunction with any negative serves for producing a positive with a corn or irregular surface, by means of which the plates can be produced as described in our former Patents, Nos. 5595 and 5596, of 1886.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS.

No. 7121. GEORGE LOWDON, Reform-street, Dundee.—May 27, 1886.

THIS improvement relates to cameras which are intended to be carried in the hand, and is particularly suited for instantaneous photography.

The camera is made so that when closed it resembles a book. In the back of the camera, which is made of wood and framed up, I fix the lens so that it is quite concealed from view, and dispense with the projections and fittings generally used, and in the back I fix a traversing shutter for the instantaneous working of the lens.

Inside the book or camera I attach a flexible body of dark cloth, indiarubber, or other suitable material, at the narrow end to the frame surrounding the lens, and at the wide end to the external boards, thus allowing the covers of the book to open sufficiently to receive the slides containing the prepared plates. This book camera is held open by means of a hinged diaphragm, which when expanded rests on the two ends of the parts representing the ends of the book.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. The improved construction of hand photographic cameras by making them in the shape or form of a book, substantially as hereinbefore mentioned, described, and represented in the drawings annexed. 2. The improved application of roller-slide apparatus to photographic cameras of the character hereinbefore described and represented in the drawings annexed. 3. The improved general arrangement, construction, and application or representation of a book for photographic cameras for hand or detective use, substantially as hereinbefore described and represented in the drawings annexed.

WAS THERE NO COPYRIGHT?—At the High Court of Justice, Chancery Division, Mr. Turner, on behalf of the plaintiff (Mr. Paine, Aylesbury), moved, *ex parte*, for an interim injunction to restrain the defendants from multiplying copies of, or offering for sale copies of, a photograph of Manor House, the residence of Baron Rothschild, at Waddesdon, Buckinghamshire, in which the Prince of Wales is seen coming out of the building. The plaintiff carries on business as a photographer at Aylesbury, and the photograph in question was taken by him, he being under an undertaking not to publish the same without the consent of Baron Rothschild. The defendant Stephens is also a photographer, carrying on business at Aylesbury under the style of the American Photographic Company, and Armstrong, the other defendant, likewise carries on a similar business at Aylesbury. The defendants having obtained a copy of the photograph in question, were said to be now offering copies for sale at sixpence each. Mr. Justice Kay, upon the plaintiff giving the usual undertaking in damages, granted an injunction over Friday week.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
April 4	Notts	Institute, Shakespeare-street.
" 4	Blackburn	
" 5	North London	Myddelton Hall, Upper-st., Islington
" 5	Glossop Dale	Society's Rms., Norfolk-sq., Glossop
" 5	Helmarth	
" 5	Sutton	Society's Rooms, 18, High-street.
" 5	Paisley	
" 5	Sheffield	Masonic Hall, Surrey-street.
" 5	Coventry and Midland	Coventry Dispensary.
" 5	Bolton Club	The Studio, Chancery-lane, Bolton.
" 6	Edinburgh Photo. Society	Hall, 20, George-street, Edinburgh.
" 6	North Staffordshire	Mechanics' Institute, Hanley.
" 6	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 7	Bolton Photographic Society	
" 7	Dundee and East of Scotland	Lamb's Hotel, Reform-st., Dundee.
" 7	Glasgow Photo. Association	Philosophical Soc. Rms., 207, Bath-st.
" 7	Leeds	Philosophical Hall, Leeds.
" 7	London and Provincial	Mason's Hall, Basinghall-street.
" 8	Yorkshire College	
" 8	Ireland	Royal College of Science, Dublin.

CAMERA CLUB.

AT the meeting held on the 24th ultimo, the CHAIRMAN (Mr. W. Ashbury Greene) referred to the early departure of Mr. W. K. Burton for Japan, and the meeting very cordially supported an expression of hope that a successful future lay before him.

The CHAIRMAN also drew attention to some silver prints sent by a country member, Mr. R. H. Bow. These had been fixed by ammonia.

Mr. H. H. O'Farrell exhibited an ingenious lantern camera in which a base-board and rackwork were dispensed with, the front being worked out upon hinged rods.

Mr. G. DAVISON then read a paper on *Alpha Paper* [see page 200].

Mr. A. R. DRESSER said that some prints which he had intensified with mercury and sulphite of soda had not faded after an exposure to direct sunlight for several days. He had used Alpha paper since 1884, and preferred to tone with hypo, gold, and platinum in one solution. He had used all sorts of developers, with results which he proceeded to show to the meeting. Mr. Dresser also showed a useful frame for the purpose of printing in clouds on bromide and platinum papers, particularly in the difficult circumstances when an oval or other shaped mask was being used.

Mr. J. E. AUSTIN then followed, especially in regard to enlarging upon Alpha paper. Some very striking framed enlargements he had recently done were exhibited, the sizes ranging as high as two feet by one and a half foot. He said that enlarging had become his hobby-horse, and he found Alpha paper the most suitable of any for his purpose. Silver, platinum, and carbon required a solar camera for this work. A half-plate or under was the most suitable size to enlarge from; the smaller lenses gave much greater depth and crispness. The negative should be full of detail. Marshness was fatal to success. The greater the enlargement required, the greater the necessity for a flat negative, because for marginal definition a smaller stop was required; hence there was a loss of light. He used an 8 x 5 rapid symmetrical, working a $\frac{1}{2}$, and found it best to focus for the part half way between the centre of the plate and edge. On a very poor, flat negative, smaller stops will improve matters. In cutting such large-sized pieces from a roll of Alpha paper, he laid it upon glass and used a guide. Treated this way, it was not so liable to tear in subsequent operations. For very large work, to make a safe edge to lift it by, he wetted a margin and turned it over, the gelatine securing this double thickness. The paper expands in the solution; twenty-four inches will expand to twenty-five. As development proceeds rapidly, it is necessary to lift these large prints just before they appear to be developed. He found iron the best developer, as giving purer whites. Pyro and potash were to be used with advantage for chalky negatives. In developing large work a wide soft brush was useful to keep the print flat. He found it necessary to allow the acid bath to get at both sides of the paper, or markings showed when dry. He found a great variety of tones result from intensification, according as sulphite of soda, carbonate of soda, carbonate of potash, or bisulphite of potash were used after the mercuric chloride. A very much over-developed print could be improved by treating with a very weak solution of bichloride of mercury.

Mr. DOUGLAS P. RODGERS considered the paper extremely useful, enabling printing in almost any desired tone by artificial light. A good print could be obtained from any negative, thin or dense. There was the one drawback that the exposure had to be learned anew for each negative. Alpha paper gave, in his hands, better detail and half tones than the bromide papers. Mr. Rodgers here showed a number of examples, ranging in tone from a black to a bright red, and gave several formulae to the action of which he ascribed these colours. The same tones were obtainable in enlargements by the lantern, using the limelight, the exposure varying from twenty seconds to three minutes. He agreed that the print always passed through a red stage in developing, but if it had only received a comparatively brief exposure, all the detail would not be out until the deeper shadows had assumed the black colours; so that if the development of such a print were arrested at the red stage, only half a picture would result. On the other hand, given a full exposure, and it was possible, by the use of a suitable developer, to produce black or red tones at will. He had used the mercurial intensifier to obtain warm tones two months ago, and had not found his pictures fade. Provided they were permanent, he considered this a very useful modification of the working, as the process could be performed in full daylight, and the exact colour judged—a thing quite impossible in the yellow light of the developing room. He did not find an acid cleaning bath necessary, the acidity of the developer being sufficient to prevent any staining of the print. The toning and fixing with gold in the hypo he had

found rather uncertain in action. Sometimes it toned and sometimes not, without any apparent reason.

Mr. LYONEL CLARK entered into a very interesting discussion of the causes of red and green images in development, and touched upon other points of scientific interest.

Mr. H. J. GIFFORD dwelt upon the permanence of bromide prints.

Mr. DAVISON said there might have been some error in his intensification experiments, as the treated prints had darkened so easily. He did not think that the colours obtained by Mr. Rodgers were traceable to the peculiarities of his developers, to which he ascribed them, but simply to the fact that those developers were strongly restrained and the prints fully exposed. He thought some of Mr. Austin's enlargements great triumphs, but many of his remarks on enlarging seemed to be open to criticism.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting of the above was held at the Technical Schools, Bridge-street, on Thursday, the 24th ultimo,—Vice-President W. J. Harrison, F.G.S., in the chair. There was a good attendance.

The minutes of the last meeting having been read and confirmed, Mr. Jonah Pumphrey was elected a member, and Messrs. Birkett and Townshend were nominated for election.

After some discussion it was proposed and seconded that the excursion on April 9 should be to Bridgnorth, Mr. Welford consenting to be leader for the day.

Amongst the exhibits a number of photographs and slides of scenes taken during the Queen's visit to Birmingham were shown by Messrs. Delicate, Pickard, Pumphrey, and Tylar, which were very interesting.

Mr. Welford then gave his paper on *The Humorous Side of Photography* [see page 202].

At the conclusion of the paper, which was very amusing and entertaining, the VICE-PRESIDENT, after thanking the lecturer, announced that the subject of the next paper, on April 14, would be *Enlargements*, by Mr. E. H. Jaques.

PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the Society was held on Wednesday evening, March 2,—The President, Mr. Frederic Graff, in the chair.

The paper for the evening, written by Mr. Charles R. Pancoast, was read, in his absence, by Mr. John G. Bullock, the subject being *Photographing at Niagara Falls* [see page 202], illustrated by about twenty-five lantern slides taken from negatives made by Mr. Pancoast.

Mr. FREDERICK E. IVES gave a short address on the subject of *Photographing by the Aid of the Phosphorescent Tablet*. He said, Photography by the aid of the phosphorescent tablet is not a new discovery, having been known since 1850. It is not even a practically useful method, and is interesting only from a scientific point of view. My own experiments with the method having resulted in the discovery of certain facts not previously known, I have been persuaded to show the results and make some remarks concerning them. The facts already well known are that Balmain's phosphorescent paint, which probably consists chiefly of sulphide of calcium, in a suitable vehicle becomes luminous when exposed to light, and the light emitted acts powerfully on photographic sensitive plates; also that heat releases phosphorescent energy. Solarised phosphorescent tablets have been used as a source of light for contact printing in the dark room, and negatives have been made by exposing the tablet in a camera and then making a contact exposure on a photographic sensitive plate in the dark room. Such a photograph I now show. It has a somewhat granular appearance, due to the coarseness of the particle of sulphide of calcium, and although the lines are partly sharp they appear surrounded by a sort of halo. The Editors of THE BRITISH JOURNAL OF PHOTOGRAPHY, in a recent editorial, advanced the theory that this effect was due to a spreading of the phosphorescence, and that it would be impossible to obtain a sharp camera photograph by the aid of the phosphorescent tablet. My belief is that the phosphorescence does not spread, and that the effect is due merely to the fact that the luminosity of the phosphorescent coating extends to considerable depth, and the light from the lower part of the layer acts diffusely, because it is radiated from a point at some distance from the surface of the photographic sensitive plate. To test this I exposed a tablet in the sunlight until fully solarised, then removed it to the dark room and placed it in contact with another tablet under pressure. It was impossible to discover any communication of phosphorescence by contact, and if any occurs it is insignificant. I also observed that prints and camera impressions on my tablets appear perfectly sharp to the eye, and found that they could be reproduced sharply by photographing in the camera. I therefore conclude that it is possible to make sharp camera photographs by the aid of the phosphorescent tablet, but that the method has no value, because it is always easier and better to make photographs in the usual way. It has been suggested that the tablet might offer some advantage in the reproduction of coloured objects. It is true that the colour sensitiveness is not the same as that of silver bromide, but the difference had been found to be altogether in favour of the silver bromide. The second known fact that I mentioned is that heat releases (exhausts) phosphorescence. It does not appear to have occurred to any one that this might be made a means of producing camera pictures by the action of the heat until I discovered that the obscure heat rays of the linelight spectrum produced a strong impression on a solarised phosphorescent tablet. I succeeded in producing heat pictures of objects under certain conditions, which are described in a communication to the Franklin Institute, and published in the *Institute Journal* for this month.

Mr. Ives showed on the screen several photographs, among which was one showing some buildings made by the use of a phosphorescent tablet in the camera, and another in which a metallic object had been photographed by the action of reflected heat rays on the tablet in the camera.

LEEDS PHOTOGRAPHIC SOCIETY.

THE ordinary meeting of the Society was held on the third ultimo,—Mr. T. W. Thornton, Vice-President, in the chair.

The CHAIRMAN then called upon Mr. Warburton to read his paper on *Gelatino-Bromide Emulsion and Plate Making*.

In the course of his remarks Mr. WARBURTON said, It seems to me a pity that there are not more in a Society like this who are their own plate makers, and I sincerely hope that their numbers will increase; it is for this reason that I have ventured to string together a few remarks on the subject. There is far more pleasure to be derived from photography when one knows that the finished picture is all his own work, and not exposed and developed by one person on a plate made by a second, and printed on paper prepared by a third. I should advise beginners to always make the same quantity of emulsion, say, twenty ounces, which is a convenient quantity, and not too bulky to wash thoroughly. Your flasks, beakers, and jars can be adapted for this quantity, and, when done with, should be thoroughly cleansed and put away till wanted again. Before actually making a batch of emulsion it will perhaps be as well to say a few words on the apparatus, &c., necessary. If a room can be set apart for the operation, at least until the emulsion is made and the plates are dry, so much the better. Let the room be made quite dark and then lighted only by artificial light, which need not be used very sparingly, provided it is of the right sort. As to the apparatus, a few flasks and beakers, or, what is almost better, two or three thin jam pots, a gas stove and tin pan, to serve as a water bath, a funnel or two, a few pieces of fine linen and chamois leather, complete the apparatus necessary for emulsifying and boiling. For washing, a piece of canvas, a hair sieve, a large basin of water, and a silver spoon, are necessary. For coating, the only additional things required are a pneumatic plate holder, a levelled slab of slate or glass, and a ladle to measure the emulsion poured on each plate; a thermometer will also at times be useful. I will now suppose that ten ounces of emulsion are required—only a small quantity, but sufficient for my illustration this evening. We shall require first the silver solution, as follows:—

Nitrate of silver.....	100 grains.
Distilled water.....	1 ounce.

This we place in a small flask.

The next solution required is the bromised gelatine, containing—

Ammonium bromide.....	60 grains.
Potassium iodide.....	4 "
Nelson's gelatine.....	15 "
Distilled water.....	3 ounces.

Hydrochloric acid, T⁴ ... Sufficient to make distinctly acid, say, about 3 or 4 drops.

Before emulsifying, this solution must be warmed, and also the silver solution; place both flasks in the water bath until they nearly reach the boiling point, and then, by means of a glass funnel passed through a cork fitting into the ring of a retort stand, and a bit of glass tube attached to the funnel by means of a piece of pure rubber tube, you add the silver solution to the bromised gelatine, swirling the flask round whilst the silver solution is running in. The silver solution run through, the emulsion is placed in the water bath to boil. If the boiling is continued from twenty minutes to half an hour you will have a plate of fair rapidity, and one that will give you a vigorous negative; by using less acid in the bromised gelatine and extending the time of boiling you will obtain plates of greater rapidity. Whilst the emulsion is boiling the bulk of the gelatine should be placed in a jam pot to soak.

Nelson's No. 1 gelatine.....	80 grains.
Coignet's gelatine.....	100 "
Water.....	2 ounces.

After the emulsion has boiled the required time take it out of the pan and allow it to cool for a while; when cooled to about 150° add it to the gelatine which has been soaking, this will soon dissolve, when the pot should be placed in cold water to hasten the cooling and cause the emulsion to set. After setting, the emulsion is scraped out of the pot with a silver spoon or a strip of glass, and squeezed through the canvas on to the hair sieve, placed in a large bowl of cold water; change the water once or twice, and leave the shredded emulsion to steep for twelve hours, changing the water a few times during that time, after which allow the emulsion to drain some time so as to get rid of as much water as possible; it may then be remelted at a temperature of about 100° to 120°, and, after the addition of half an ounce of methylated alcohol, it is ready for coating the plates. If it does not measure ten ounces make up to that quantity with water. If the plates are old or spoilt negatives they should be placed in a hot and strong solution of soda until the films come off, then thoroughly rinsed in cold water, rubbed with a cloth dipped in tripoli powder, rinsed again, and dried on a cloth free from fluff; previous to washing the sharp edges of the glass should be taken off by drawing the edge of one glass over the edge of another, and thus two plates are done at the same time. With regard to a substratum on the glass, this is not always recommended, but it will be found best to use one, as frilling is less liable to occur. The best to use consists of white of one egg, water, sixteen ounces. When the substratum is dry the plates may be coated with emulsion, but before coating it will be necessary to filter through chamois leather. This is best done by tying the leather across one end of an Argand lamp chimney, the emulsion is then poured in the chimney, and if slow in running through the lips may be closed round the open end when, if pressure is brought to bear on the emulsion by blowing, it will easily filter through. The best way to coat the plates is to place them on the pneumatic holder and, by means of a ladle holding the proper quantity of emulsion, pour it on the plate; a glass rod may then be used to cause the emulsion to flow into the corners of the plate, when it may be set on the levelled slab to set; it should then be taken to the drying box, if one is used, but the plates will dry perfectly if they are left leaned against a number of bottles placed on a table; in this way I have dried many scores of plates. In conclusion, I would say to those who have a desire to prepare their own plates, "Do not attempt it unless you feel that you have a love for the work and a desire to see your pictures as much as possible your own work; do not attempt

It merely for the sake of economy, and do not be discouraged by a failure or two, and success will certainly follow."

In the discussion which followed, the CHAIRMAN said that he quite agreed with the remarks which had fallen from Mr. Warburton with respect to the pleasure that was to be derived from emulsion and plate making; indeed, every amateur should, in his opinion, make his own plates, if he really wished his pictures to be considered his own work. With respect to the practical part of emulsion making, he (the Chairman) differed somewhat in the manner in which he prepared his emulsion to that which had been explained to them; in the first place, he always added his silver nitrate in crystals to the bromised gelatine, stirring until they were dissolved; he did not boil longer than ten minutes, in which time he could get sufficient rapidity; this, however, might depend to some extent upon the gelatine and the more or less acid state of the emulsion. He did not use a substratum, and he had never found one necessary.

Mr. FORDSMITH said he always used a substratum; he believed it was the best preventative against frilling; he had also found that much of the glass in use for negatives was in itself not level, and thus caused unequal thickness of films.

Mr. RODWELL said he believed the simplest and, in his opinion, most efficient mode of adding the silver salt was in the shape of crystals, the bromised gelatine being contained in a hock bottle, which was then shaken until the crystals were dissolved; it was then placed in the hot water to boil; he had found a hock bottle to bear the boiling without breaking, and its non-actinic colour was a safeguard against stray light. With respect to drying, he preferred a drying box through which a current of air could be sent heated to about 70° or 75° Fahr.

Mr. BASS said when he commenced to make emulsion he was led to believe that it was necessary to churn the emulsion up whilst the silver solution was being added, and for this purpose he had made a mixing apparatus with jiggers and whisks, which he had since found quite unnecessary. All amateurs should prepare their own plates; given a finished picture, he believed seventy-five per cent. of the credit should go to the makers of the plate and paper on which it was printed; of course this must be understood to apply only to the technical qualities of the picture, as artistic qualities might exist in a high degree without technical excellence, and *vice versa*.

The next meeting of the Society will be held on Wednesday evening, April 6, at the Grand Restaurant, Boar-lane, Leeds, at seven p.m., when the President (Colonel Harding) will deliver a Presidential address.

Correspondence.

Correspondents should never write on both sides of the paper.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

To the EDITORS.

GENTLEMEN,—At the commencement of the present year a circular on the subject of the forthcoming Photographic Convention was sent to the Secretaries of all the Photographic Societies whose addresses had been published. A paragraph in the circular ran as follows:—

"With a view of making the Convention thoroughly representative, I shall be glad if your President, or one of your members nominated for the purpose, will represent your Society at the Committee Meeting, to be held during the week of Convention."

The intention has been to endeavour to put the Convention upon a firm footing for increased usefulness beyond the "outward and visible sign" of an enjoyable holiday, combined with instructive knowledge derived from the evening meetings. The object is, first to make the Convention in every respect thoroughly representative.

It must be obvious that a body of this kind, commanding the entire confidence of the professional and amateur alike, would be in a position to effect considerable good. There are many questions not partaking of a legal nature, materially affecting the interests of the photographic fraternity, that could with advantage be discussed by, and arbitrated upon by such a body, even if the meetings were held only during the week of Convention. It is unnecessary here to summarise the good and useful work that might be done beyond what I have merely hinted at. I am more immediately concerned now in urging those Secretaries who have not already done so to send me at an early date the name of the gentleman chosen by the members of their Societies to represent them at Glasgow in July next.—
I am, yours, &c.,
J. J. BROWNLOW.

Albert-road, Walthamstow.

A NEW LANTERN SLIDE CARRIER.

To the EDITORS.

GENTLEMEN,—It was with some little surprise that I read Mr. Bridge's letter in your last issue, in which he asserts that the carrier described by me in one of the annuals is not original, having been suggested and used by him and his colleague, Mr. W. Brooks, since the year 1884. I find, by reference to my note-book, that my first carriers of this description were made in April, 1883. Some months after that date I showed them

to Mr. W. Brooks, who much admired them, and stated his intention of trying them for his own work. With this circumstance in my mind, I wrote last Friday to Mr. Brooks, sending him Mr. Bridge's letter and inviting his comments upon it. To-day he writes as follows:—

"As far as my memory serves me, you showed me your carrier at the South London Lantern Meeting, which always took place on the first Thursday in January, I think it was in 1884, and I at once made about one hundred. I was not aware that Mr. Bridge made any before that date."

I may add that the first carriers were made of Willesden paper, and that each carrier was provided with an opening (closed by a piece of wood) for the admission of the slide, as described by Mr. Bridge. I quite acquit that gentleman of anything more serious than a *lapsus memorie*, and feel glad that the little contrivance reached the hands of one who appreciates the convenience which it affords.—I am, yours, &c.,
T. C. HEZORTH.

45, St. Augustine's-road, Camden-square, N.W., March 28, 1887.

"THE RIGHT TO THE NEGATIVE."

To the EDITORS.

GENTLEMEN,—Under the circumstances mentioned by your correspondent, Mr. Debenham, in your last issue, the individual referred to can have no more claim to the negatives than to the camera and lens with which they were taken. If I were threatened in a similar manner, I should at once come to the conclusion that a person who had made a ridiculous demand would certainly order no more copies, and settle the question of "right to the negatives" by dropping them into a copper containing boiling water, in which a packet or two of Manby's cleansing crystal had been dissolved.—I am, yours, &c.,

F. A. BRIDGE.

East Lodge, Dalston-lane, London, March 29, 1887.

DOUBLE PRINTING AND RETOUCHING.

To the EDITORS.

GENTLEMEN,—Permit me to express my sincere thanks to Mr. Macbeth for his remarks regarding double printing and retouching, and I do hope that a great many photographers will agree with his views and consider negative retouching as it is done nowadays only as a means to please the customers in general.

I am afraid so-called composition photographs, as well as hatched up negatives, resemble too much those groups and portraits seen at a cabinet of waxworks to be compared with the painters' or sculptors' art, and photography can only approach the latter by good lighting and posing the object and by obtaining a negative which will give a satisfactory print without any stippling, &c.—I am, yours, &c.,
OVER-WEARY.

Liverpool, March 29, 1887.

"THE BRITISH JOURNAL OF PHOTOGRAPHY," No. 1403.

To the EDITORS.

GENTLEMEN,—1403 is last week's. It contains a portrait of Mr. W. K. Burton, which is so excellent that every person concerned in producing it may be fully congratulated.

It contains also a paragraph calling attention to the admirable subjects for the camera to be got by early visits to several markets. This is common-sense, and therefore good advice.

It contains also a recommendation that two days should be employed away from home in taking six exposures; the first day in fixing their locality, and by a compass deciding upon what time of the day to visit them. This is by an American gentleman to American photographers, and I feel I have nothing to do with it. Were it addressed by any one to London amateurs, I guess I should quiz it. Londoners, Gentlemen, have a site that gives more scope for subject than any place in the world. I belong to a coterie that contemplates weekly excursions for exposure making. I fancied my compatriots looked at me cynically if not pityingly when I said, "If they decided on Limehouse, Wapping, Greenwich, or the river generally, I would join them; but if they contemplated glades, with beech-trees, and rustic houses, twenty miles from town, they must excuse me."

I some time since decided upon spending a week in town in May, with the sole object of trying some of its thousands of fine studies, on quick plates, with a good lens, and an exceedingly rapid shutter. With this object in view, I thank you most heartily for the mention of early morning markets. If I cannot get a dozen good subjects on a fine morning before breakfast I am a duffer.—I am, yours, &c.,

WILLIAM ADCOCK.

Melton Mowbray, March 28, 1887.

Exchange Column.

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

- Studio chair with changing backs wanted in exchange for a burnisher.—Address, PHOTOGRAPHER, Chardstock, Dorset.
- A burnisher, nine-inch bar, in exchange for a 8½×6½ single lens by good maker, or magic lantern.—Address, H. HOLMAN, Banff, N.B.
- I will exchange a complete set of limelight apparatus for a whole-plate portrait lens.—Address, H. BROOKE, Studio, Shepton Mallet, Somerset.
- Ross' No. 3 quick-acting C.-D.-V. lens, exchange for No. 6 or 7 Ross' portable symmetrical.—Address, C. H. L., Forest-cottage, Three Bridges, Sussex.
- Gen camera, twelve lenses; Victoria camera, one lens; and Ross' 5×4 instantaneous doublet. Wanted, Dallmeyer's 3p patent.—Address, American Studio, Mold.
- Quarter-plate instantograph camera, three double backs and tripod. Wanted, good mechanical or coloured lantern slides.—Address, PROCTER, Hôtspur-street, Tyne-mouth.
- will exchange 12×10 tourist camera, with 12×10 rapid rectilinear lens, for a portable studio, complete.—Address, WALLACE FORB, 9, Hartley-street, Burnley-lane, Burnley, Lancashire.
- Wanted, whole-plate rapid doublet or offers (lenses), for twenty-eight painted and six rack astronomical lantern slides.—Address, COUCH, 6, Berkeley-street, Piccadilly, London, W.
- Voigtlander lens, for 18×16, would exchange for two second-hand Seavey backgrounds, seascape and interior preferred.—Address, C. E., Kemp & Co., Infirmary-street, Edinburgh.
- Wanted, a good half-plate rolling press or burnisher in exchange for magic lantern oil or limelight, six-inch condensers.—Address, W. B. CASSINGHAM, 9, St. Peter's-street, Tnbridge Wells.
- Will exchange twelve-inch square leather-bellows camera, by Rouch, latest improvements, single and double dark slides. Wanted, cabinet leather-bellows camera by good maker.—Address, THE STUDIO, Silver-street, Westminster.
- Will exchange a Voigtlander's whole-plate lens and a half-plate camera, with three double dark slides, for 12×10 Ross' rapid symmetrical or a Dallmeyer's rapid rectilinear.—Address, E. GREGSON, Imperial Studio, Bedford-street, Halifax.
- I will exchange THE BRITISH JOURNAL OF PHOTOGRAPHY, from 1879 up to present date, for half or whole-plate view lens, half-plate camera for outdoor use, or half-plate rolling press and cameo press.—Address, G. MASTERS, 17, Elcot-avenue, Commercial-road, Peckham, London, S.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED:—

James Waddington, 131, Montague-street, Blackburn, Lancashire.—Four portraits of Rev. R. P. Ashe, B.A.

- S. A., O. WILLIAMSON, G. B. J.—See article in the present number.
- T. H. M.—Nothing is better than a thin solution of gelatine used in the manner that has so frequently been given in the JOURNAL.
- H. I. (Ackworth, Pontefract).—The best work on the subject is Hurlwich's *Photographic Chemistry*, published by Messrs. Churchill, New Burlington-street, W.
- J. H. M.—The procedure is just the same. The immersion in the acid need be very short. Only a very slight washing is required, and then the negative may be quickly dried, so that no injury need be incurred if care be exercised.
- MICRO.—With a quarter-inch objective the light you have been trying with is quite insufficient. As you appear to be a novice in photo-micrography, you had better begin with a low power, say, one or two inches, and use neither eyepiece or supplementary lenses.
- R. STROUD.—The excessive coldness in tone of the gelatino-bromide print is due to its being under exposed and forced in the development. If the exposure had been one-third longer the tone would have been much warmer. The care you take in the fixing and washing will no doubt secure permanency.
- F. I. L. asks: "Will you kindly inform me, through the medium of your paper, how the blacking for the inside of dark slides should be made?"—Lampblack, or, preferably, what is known as drop black, mixed with equal parts of ordinary negative varnish and methylated spirit forms one of the best materials that can be employed.
- IRIS.—1. Any of the commercial shutters will answer the purpose. That indicated by your friend is a very good one.—2. An iris diaphragm is a series of flat plates working on pivots which can all be brought simultaneously to a centre so as to open or close the aperture.—3. The Wollaston shutter is described on page 486 of our volume for 1886.

M. LE TOURNEUX writes: "I should esteem it a favour if you would kindly give me the address of a firm, through the medium of your columns, where I could procure gelatinised paper suitable for making transfers for photo-lithographs."—Paper specially prepared for photo-lithographic transfers is supplied by Mr. E. Liesegang, Disseldorf, Germany.

A. C. WARNER.—You will have to pay a duty of about forty per cent. on your photographic apparatus when you take it into America. If you can succeed in convincing the officials that it is only for your own use it will be admitted free of duty, but if the apparatus be new we fear you will not be successful in this. With old-looking or shabby appliances you might succeed.

Wm. SUTCLIFFE says: "I am in possession of a lens which has marked on the flange 'Steinheil, Aplanat, 23 Lin.' Would you kindly let me know, through your 'Answers to Correspondents' column, about this lens, and also what '23 Lin.' means? I fancy it refers to its focus, of which I am ignorant.—This means the diameter of the lens. A "lin" is practically the one-twelfth of an inch, consequently twenty-three lines is, roughly, about one-and-three-quarter-inch.

IL. C. M.—We could only ascertain the candle power of the ribbon enclosed by photometrical experiment. Of course the power of the light must depend upon how the magnesium is burnt. If the ribbon be pointed downward the combustion would be more rapid, consequently the light will be more brilliant and burn for a shorter time than if it were directed upward. Whatever may have been stated at a public meeting, the wet collodion process is a slow one compared with the gelatine. As a rule, lantern slides by the wet collodion process are better than those made on gelatine unless the plates are specially prepared for the purpose. A large proportion of the commercial slides are made by the wet collodion process.

W. E. GRAY says: "I propose going with a party of friends for a few days to Paris at Easter. I thought of taking one of my cameras with me, and should feel greatly obliged if you could help me in the following matters in your 'Answers to Correspondents' column:—Is any permission necessary from the police or other Parisian authorities to photograph either landscapes, instantaneous views, or buildings, in or about Paris? Would the Custom House authorities offer any difficulty provided camera and slides were shown them, or would they want to open boxes of plates? Would it be advisable to label plate boxes with French labels stating contents?"—Permission is required to take photographs of the public buildings in and about Paris. If our correspondent is not familiar with Paris and its regulations as regards photographing there, he had better put himself in communication with the French Legation here, explaining what he wishes to do. In this way he may save himself what might otherwise be a considerable amount of trouble. If the contents of the boxes be politely explained to the Customs officials no difficulty will be experienced. Labels explaining the contents both in French and English should be affixed to the boxes containing the plates.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, April 6, will be *Portable Tents and Plate Changing Contrivances*. The Bank Holiday outing will be at Radlett. Trains from Moorgate-street and St. Pancras.

MR. J. TRAILL TAYLOR, of THE BRITISH JOURNAL OF PHOTOGRAPHY, is announced to read a paper on *Lenses* before the members of the Balloon Society at the Royal Aquarium on Friday, April 29. The chair will be taken by Mr. A. L. Henderson. Photographers are invited to be present and take part in the discussion.

A MEETING of those interested in the well-being of the Photographers' Benevolent Association, convened by Mr. J. Hubert, was held on Thursday last week, Mr. William Bedford presiding. After hearing from Mr. Hubert a statement regarding an alleged grievance of a personal nature, and a proposal of the expediency of having an honorary instead of a paid Secretary, a motion expressive of entire confidence in the Committee of Management was proposed and carried by a large majority.

On Thursday, March 24, the London and Provincial Photographic Association held a smoking concert, in place of the usual scientific meeting, at the Mason Hall Tavern, City, London, under the presidency of Mr. J. J. Brighshaw. Upwards of two hundred persons were present. Among the singers and musicians were Messrs. H. T. Starnes, E. Mills, A. Glover, R. Keeves, F. W. Jones, George Leipold, P. Hembrow, W. H. Ware, F. G. Read, J. Kitchener, H. G. Prim, J. Andrews, and L. Carozzi.

At the weekly meeting of the Balloon Society, held in the Royal Aquarium on Friday last, the following resolution was proposed by Mr. W. H. Le Fevre, C.E., President of the Society, seconded by Sir John Bennett, supported by Mr. A. L. Henderson, and carried unanimously:—"That this meeting of the Balloon Society of Great Britain most cordially wishes Mr. W. K. Burton, C.E. one of its early members, health, prosperity, and safe return, on the occasion of his appointment as Engineer of the Imperial Institute of Tokio, Japan."

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE PRESENT STATE OF THE STRIPPING FILM.

It is problematical whether at the termination of Mr. Wollaston's demonstration of stripping films at the meeting of the London and Provincial Photographic Association on Thursday, last week, there was one among the representative body of his hearers who did not go away imbued with the determination to give the process a trial when opportunity arose. "Easy as falling off a log," is a favourite Transatlantic standard of comparison; and this adequately represents the facility with which a seemingly difficult, if not mysterious, method of working was demonstrated in actual practice.

A sheet of paper which has been subjected for one or more seconds to an exposure in the camera—the precise time being quite unknown to the manipulator—is developed into a vigorous negative; the paper support is removed, and the negative is now found attached to a plate of glass; anon, the glass is removed in turn and the negative is found to be attached to a pliant and transparent support of flexible gelatine, capable of being rolled up for transmission by post if required—all these effected without a hitch, and by rapidly successive stages, indicate the state at which the stripping of films has now arrived. Surely the aspirations of those who desire the extreme of simplicity conjoined with the extreme in portability can scarcely farther go.

The paper prepared expressly for being subjected to the stripping-off treatment, possesses unmistakably a great advantage over ordinary negative paper, inasmuch as the negative may either be left in adhesion to the original paper support (the limit of the ordinary paper) or it may be transferred to a glass plate, or, finally, be placed in adhesion to a strong pliable sheet of gelatine. These advantages are so great that we may well express an unbelief as to any other negative paper being demanded in the future, especially as its preparation cannot be supposed to involve much if any additional expense, for it merely resolves itself into giving the paper a coat of size composed of plain soluble gelatine previous to applying the gelatine emulsion in which the negative itself is made. The negative, therefore, rests not upon the direct surface of the paper, but upon a substratum which is soluble in warm water and which forms an intermediary layer between the negative film and the paper support.

Of the precise constitution of this substratum we are not definitely informed, but there seems no doubt that a soluble gelatine possesses for this purpose qualities which render it specially valuable, because of its being unaffected by solutions or water at the ordinary temperature, while, when it is desired

that the negative be stripped, a brief immersion in warm water easily permits of the paper support being loosened from the negative film. Owing to this soluble substratum, if the negative is to be left on its paper support nothing is lost, while if it is desirable it should be removed everything is gained.

Let us suppose then that the negative has been developed, fixed, and washed, the next operation consists in removing it from the paper and transferring it to glass. While the negative is still wet it is laid face down upon a plate of glass prepared in the following manner:—After an application of powdered French chalk, which, after having been rubbed all over the surface is dusted off, the plate is coated with ordinary plain collodion, in which, by preference, one or two drops of castor oil per ounce have been dissolved in order to impart toughness. After this has set the plate is placed in a dish of water and rinsed until the removal of the alcohol and ether is shown by the surface being free from a certain apparent greasiness.

When this stage has been reached, the negative is "squeegeed" upon the plate, and the superfluous moisture is removed by blotting-paper. After a brief interval, but without giving it time to dry, the plate, with its adherent paper negative, is placed in warm water, which has the effect of dissolving the gelatine substratum, and permitting the paper to be stripped off, leaving the negative itself attached to the collodion film upon the glass.

But the collodion is in only slight adhesion to the glass, for it will be remembered that the surface of the latter received treatment with French chalk, or steatite, which imparts a certain degree of unctuousity to the glass.

The permanent support of the negative is a sheet of flexible gelatine, flexibility being imparted presumably by the addition of glycerine to the gelatine previous to its being formed into a sheet. When such a sheet is wetted and is rubbed in intimate contact with the negative film upon the glass, a close adhesion is engendered between the two, and after a little time, if the sheet of gelatine be stripped from the glass, it will be found that it has brought away with it the film, these two being ever afterwards united together.

The process, as we have just described it, may, perhaps, seem complex, and not unattended with risk, but, as a matter of fact, it is not only very simple throughout but also quite safe. To lose or destroy a negative in course of adopting the stripping operation is a thing practically unknown.

The method of stripping a negative film as we have described it has been, as a whole, patented by the Eastman Company, but no one will begrudge them their proprietary rights in the

patent if they will only ensure an adequate supply of the material being accessible to that section of the public who object to carrying a load of glass plates about with them when on a journey either for pleasure or business.

SOME POINTS OF PRACTICE IN THE USE OF ALKALINE DEVELOPERS.

WE lately devoted some space to the consideration of the alleged uniformity of result to be obtained when using the fixed alkalies instead of ammonia with alkaline pyrogallol, and we think we showed the great danger there existed that a possible certainty and uniformity might become a probable uncertainty and irregularity from, firstly, confusion of nomenclature, and, secondly, impurity of the alkaline salt chosen. Before going further into our subject, we may emphasise and supplement our observations referred to by pointing out that the particular carbonate which appeared to us likely to obtain the ultimate preference—the carbonate of potash—is, further, liable to considerable variations of power owing to its deliquescent nature. Salts of tartar, the most common name for this carbonate, absorbs moisture from the atmosphere most rapidly and greedily; a portion of it left in a paper parcel, for example, would in a day or two run into a liquid, and, naturally, there would be all stages of moistures between absolute dryness and a saturated liquid, which would lead to as great irregularity as would be likely to occur with ammonia.

Hence we are led to the precautionary indication that both liquid ammonia and carbonate of potash should be carefully kept in well-stoppered bottles to avoid giving to, or taking from, the atmosphere. In this connection we may give a useful hint. The stoppered bottles containing strongly alkaline substances are, if left at rest for a while, very liable to become so fixed as to resist every effort at removal. But this mishap may be avoided by slightly smearing the stopper with vaseline, which will prevent the solvent action of any small particle imprisoned between stopper and neck. This little wrinkle is as useful as it is simple.

We do not know that in the results obtained by the various developers, and combinations of developers, ringing the changes on soda, potash, and ammonia, that any large proportion of workers claim for the fixed alkalies any superiority as to the quality of the negative produced by their aid. The chief point dwelt upon has been the volatility of the ammonia, and the consequent uncertainty as to its strength at any particular moment. Seeing that this liability to uncertainty of strength may be greatly mitigated by diluting the ammonia before taking it into the dark-room stock, we cannot but think that more has been made of this point than is necessary. It is as nothing compared with the quality of the image. But this is a subject that need not occupy us now; we may refer our readers to the indications of a long and laborious series of experiments made by us some time ago, and recorded in these pages.

So far we have dwelt upon the vagaries of the constituents of the alkaline developer before they are mixed together; still more pronounced, according to the advocates of soda and potash, do they appear when thus brought into use. A plate put into a soda or potash developer is exposed to a solution of uniform strength, they say, whether it take five minutes or an hour to develop, while with an ammonia developer it is impossible to say what amount there is present after the lapse of a few minutes. Taking the standpoint that we do of the

desirability of the utmost possible uniformity in the chemicals made use of, we admit this is a fair point to make; all the same, it must be said that the tendency of ammonia to escape from dilute solutions is very much weaker than with saturated solutions containing many hundred times their own volume of gas, and we must not lose sight of the possible absorption of carbonic acid gas by soda, &c. We may say that we have a series of experiments in view to ascertain the rate and extent to which weak aqueous solutions of ammonia part with the dissolved gas to the atmosphere at various temperatures.

We are naturally led from this branch of our subject to a consideration of the keeping powers of mixed developers stored ready for use in well stoppered bottles. These are used by many, and well spoken of; but a singular incident occurred in our own practice the other day, that has caused us to initiate an investigation, not yet concluded, in regard to it. We were developing a set of test exposures, and when repeating similar experiments of a fortnight previously, some mixed developers (soda and potash separately) failed to produce the same results. True, the stock of solutions was reduced in quantity, and scarcely did more than cover the bottom of the large bottles that contained them, and thus might have absorbed carbonic acid from the air, and so reduced their developing powers. Be the cause what it may—and we have not yet discovered it—the fact remains that in this particular instance the solution appeared to work differently a fortnight after it was mixed. Still we must say we have no grounds for anticipating that the explanation will be that ready-mixed developers do change.

The question of perhaps greatest interest to amateurs who are in the habit of developing large numbers of negatives at a time, is the length of time which the same trayful of solution will continue to act. We put the matter to a severe test last week (the temperature of our dark room was about 50° Fahr.). Undertaking some experiments involving a large number of developments, we arranged a series of trays with developers of gradually increasing strength, and passed each plate through each solution, beginning with the weakest (two grains pyro, eight grains sulphite, one minim of ammonia, half a grain bromide). Our developments lasted close upon two hours, and for the whole of that time the solutions were in constant use, and were only kept up to their original bulk, as the plates passing through absorbed the solution, by adding normal developer to them.

We were not testing the actual developing power of a particular solution, so that in our observation in this respect rigid exactitude was not attempted. We may say that, practically, though upwards of a dozen plates were passed through the one solution, its developing power at the close of almost two hours' continuous work seemed very slightly impaired, the quality of the image produced not at all.

The development of a plate cannot be brought to the level of an exact science, for a "personal equation" must always intervene; still, the more facts that can be gathered to throw light upon the process the nearer shall we reach the goal of exactitude and reasonable certainty.

A PROPOSAL FOR A SENSITOMETER.

THE first defect in the instrument described last week, as actually constructed, is that for ordinary gelatine plates the exposure it gives is far too long. The maximum exposure given is, as stated, one-tenth of a second, the minimum, the one-thousandth. The latter would be brief enough for a camera

exposure, to be sure, but it must be remembered that in the sensitometer the exposure is made to direct light, a very different thing. Still, it might be imagined that if the period of exposure were really cut down to that figure, it would meet the requirements of even our most sensitive plates if due precautions were used to limit the quantity without interfering with the quality of the light employed.

But, as it turned out, such was not the case, and it may be at once stated that the theoretical measurements of time expected from the instrument were by no means worked up to, owing mainly to faulty construction. For instance, a plate giving 20 on the Warnerke sensitometer was exposed in the "drop" instrument at a distance of ten feet from the open door of the dark room, looking into another not over well lit apartment, and with no direct light from the windows entering or falling upon the sensitometer. The result was a rendering of the full length of the exposure slot, which after all, perhaps, would not have greatly surprised us had it not been that there was not the faintest sign of gradation in the tint, the limit of shortest exposure being as fully impressed as the longest. Recourse was then had to a feebler illumination, but still daylight, and the sliding shutter of the dark room window was utilised for the purpose. Several exposures were made with the shutter drawn out to varying distances, allowing a narrow slit or strip of white light to enter the room; but, even when this aperture was cut down to twenty inches by half an inch, and the exposure made at a distance of fourteen feet, the result was practically the same—a nearly even tint the full length of the exposure slot.

A little consideration suggested an explanation of the want of gradation. As we had been using the instrument, the base of the triangular opening in the exposing drop was lowermost, consequently the shortest divisions of the total exposure were made and finished first, or, in other words, when the shutter was gaining momentum as it gradually overcame its natural *vis inertiae*. Consequently, the shortest divisions of the scale, or those which ought to have represented a few thousands of a second, were subject to far greater error from friction and other causes than the longer ones, and as a matter of fact the gradation of the scale was very nearly neutralised. Upon making an exposure with the instrument reversed, that is to say, with the drop in such a position that the apex of the triangular opening commenced the exposure and the finer tints were made last, the difference was most marked; for, though the tint still extended the full length of the exposure slot, it was not, as previously, devoid of gradation, but, on the contrary, showed a gradually decreasing intensity of tint at one end of the scale. In this position, however, the instrument, if otherwise perfect, would be valueless in point of accuracy until the shape of the aperture was altered.

At the same time that the exposure was found to be too long for daylight, it proved to be altogether inadequate for artificial light, an exposure made at a distance of three feet from a small paraffine lamp failing entirely to produce any impression. Upon repeating the exposure at a distance of one foot a very faint image of a portion of the slit was obtained. When the front of the sensitometer was covered with a sheet of deep orange glass and exposed in feeble sunshine, the impression produced extended the full length of the slit; but when exposed, as before, in the dark room, the coloured glass was sufficiently powerful to arrest nearly the whole of the active rays.

From what has been said it will appear, then, that not

only is the instrument inaccurate in use from faults of construction, but it is also too limited in range for general purposes, giving too long an exposure under some conditions and not sufficiently long under others. But, in addition to these, there is one other circumstance that militates against the correctness of the readings, namely, the diffusion of the light along the exposing slit during the opening and closing of the shutter. As suggestions for overcoming these difficulties we offer the following:—

In order to minimise the effect of friction in arresting the free fall of the shutter, we would propose to considerably lengthen the latter, say, to three or four feet, allowing the greater portion of this to fall before the actual exposure commences. Thus, by the time the light commences to act upon the plate, the falling shutter will have acquired such a degree of momentum as to render it practically free from the interference of friction, provided, of course, that the apparatus is well and carefully constructed. Further than this, owing to the fact that the shutter will, after falling, say, three feet, drop through a greater space in a given time than when the exposure commences, as in the instrument constructed by us, after a fall of only two inches, it follows that with a given size of aperture a much wider range of exposure can be obtained, though, of course, the shape of the opening would have to be recalculated.

It is, however, questionable whether in the case of an opening at the upper end of a drop of the dimensions just named, the trouble of calculating the curve is necessary, or whether the nicety of theoretical accuracy is not neutralised by the mechanical faults of the instrument. A simple triangular opening, having for its longest side the distance the shutter is calculated to drop in a given time, would appear to us to be sufficiently near to accuracy to serve every purpose, the margin of error being well within that likely to occur from other causes, as, for instance, in development. With such an opening it would be a matter of the greatest ease to vary the size of the aperture at will, in order to suit light of different value or plates of different sensitiveness.

With regard to the alteration of the dimensions of the aperture, it should be borne in mind that as the readings are taken in terms of actual time no confusion or uncertainty need arise in adopting this course, provided the maximum exposure given by each aperture be calculated to bear a definite relation to each of the others. Thus, apertures giving maximum exposures of $\cdot 01$, $\cdot 05$, and $\cdot 1$ of a second may be divided on the same base line, and will bear the same definite relation to one another throughout. Thus, with the same drop, it may be rendered possible to deal with either day or artificial light.

In order to prevent the error arising from diffusion of the light in the direction of the exposing slit, we would insert between the drop and the sensitive film a perforated plate, forming a series of separate chambers, as in the Spurge actinometer. But, unlike the latter instrument, it would be unnecessary that the perforations be made of any definite sizes in order to admit varying quantities of light; all that would be needful would be to place a number of minute perforations at regular distances apart, the drop graduating the proportion of light admitted into each chamber so formed, and limiting its action to that particular portion of the sensitive film enclosed. The "tint" given by such an arrangement would, of course, instead of being continuous, consist of a series of isolated dots or fine lines, and these might easily be so arranged as to be self-explanatory in taking the readings.

Nothing has yet been said with regard to a standard of light, but the instrument was not originally intended as a standard, but merely for comparative purposes. If, however, a standard be desired of moderate reliability, probably nothing would prove more convenient than the reflected light of magnesium burnt at a given distance from a white screen of definite dimensions. Or it might be burnt at a fixed distance behind a translucent screen of small area, and the exposures made direct. The light given by burning magnesium sufficiently resembles that of the sun to render it a tolerably reliable guide for purposes of comparison, and it would certainly be under greater control so far as uniformity is concerned. It would also be easily applicable in connection with coloured screens, and for the direct comparison of white and coloured light.

We hope at a later date to be able to report upon the results obtained with an instrument we are having constructed on the lines now indicated; meanwhile, it is possible that improvements may suggest themselves to some of our readers interested; if so, we shall be glad to hear of them.

A LAWSUIT, and one which is likely to prove of considerable importance to the photographic profession, in reference to copyright and the protection of their works from piracy, is now pending in the Chancery Division of the High Court of Justice. As we announced last week, Mr. G. S. Paine, of Aylesbury, had obtained an interim injunction restraining another photographer and stationer in the same town—the former from reproducing, and the latter from selling copies of one of his photographs. On Friday last, an application was made to Mr. Justice Kay to extend the injunction until after the trial of the action. This the learned judge granted. This case will be watched with interest by more than those immediately interested.

PHOTOGRAPHY might advantageously be utilised by the Society for the Prevention of Cruelty to Animals. If some of the inspectors were supplied with a small camera, rapid lens, and instantaneous shutter, they could often secure a small negative which might, subsequently, and quickly, be enlarged on to bromide paper and produced in Court as evidence. A photograph of an overburdened and jaded horse, in the act of being cruelly ill-treated by its driver, would do more to secure a conviction for the offence than the exhibition of the animal after a night's rest and perhaps careful attention, an empty vehicle, and almost any amount of sworn evidence on the following day. How frequently, in the suburbs of London, is to be witnessed five or six great "hulking fellows" of the costermonger class, seated in a small vehicle behind a half-fed, diminutive "Jerusalem," while one of the number is unmercifully belabouring it with a heavy cudgel. In such a case as this an instantaneous photograph of the scene, if submitted to the magistrate, would, there is little doubt, frequently aid in the administration of justice to the delinquents. Several of the local Hon. Secretaries of this useful Society, we are given to understand, are expert amateur photographers, therefore they might well utilise their favourite art as an aid in the cause they so humanely espouse.

In connection with photography furthering the ends of justice, here is a suggestion by an ingenious friend, who, it is scarcely necessary to mention, is an enthusiast in photography. Much comment, as all are aware, has recently been made on the fact that policemen on duty in country districts, as was that courageous fellow at Finchley, are not provided with revolvers for their own protection. Our friend suggests, if the constables are not to be entrusted with these weapons, that they should at least be armed with syringes, or bulbs, charged with a solution of nitrate of silver. He says if that plucky fellow who has been so cruelly mutilated, could have discharged some silver solution on the faces of his assailants, the morning light would soon have developed them into conspicuous objects, and that no doubt ere this the miscreants would be under arrest. A man with a face

resembling those seen in some of the advertisements for Pears's soap, could not fail to attract considerable attention, and, if the suggested plan were adopted, excite suspicion. A nitrate of silver stain on the face, as all who have tried it are aware, is not easily removed by cyanide of potassium without injury to the skin, so that the remedy might prove worse than the disease. The idea of our friend for securing identity, though ingenious, is scarcely new, as we have heard of a photographer who always kept two or three small flasks of silver bath in his bedroom, ready to dash in the face of any nocturnal visitors he might encounter who had entered his premises surreptitiously in search of plunder.

THE preparation described last week for flattening backgrounds in oil colour is one of the best that can be employed for painting studio accessories. Balustrades, rockwork, and other movable properties painted with this material, will not show marks of handling or slight abrasions to anything like the same extent as they would with the ordinary turpentine flattening, or the distemper, so generally used. The surface may also, with care, be washed without causing injury.

It does seem somewhat anomalous, now that the more artistic section of photographers, in unison with the improved taste of the public, are aiming to make their productions, both as regards colour and style of mounting, resemble engravings as much as possible, that engravers and lithographers appear to be striving to make their work look as much like photographs as they can. Prints from typographic blocks and lithographs are now being largely produced in the recognised photographic brown colour, and the general "get up" of them is intended to convey the idea that they are veritable photographs. However, photographic artists may congratulate themselves that this class of work is chiefly confined to prints issued with some of the cheaper publications, and those used for advertising purposes.

WE have frequently directed attention to the more or less generally neglected state of photographic show-cases. The particular point we are now going to speak upon can scarcely, however, be called neglect, though it is so in one sense. We allude to the amount of moisture which is often imprisoned in, and which cannot escape from, the frame. The other day, on passing through Regent-street while the sun was shining, we noticed that in the majority of the frames exhibited, and indeed in some of the shop windows, the pictures could not be seen, owing to the condensation of moisture on the glass. Of course, when the glass became heated by the sun's rays, the water would again be vapourised and then condense on the pictures and mounts. Under these conditions the photographs are continually exposed in a humid atmosphere to a strong light. This is reckoned one of the most trying ordeals to which either silver prints or any other form of photograph can well be subjected. Hence, there need be little wonder that prints exposed to these conditions often show signs of premature decay. When a show-case is fitted up, if it is to be hermetically sealed, and it should be, care ought to be taken that the mounts and pictures, as well as the backboard, are made perfectly dry. To prevent ingress of moisture, the glass should be secured in the frame with putty, and the backboard painted with one or two coats of oil colour, Brunswick black, or other impervious material. When this is not done, it is better to have one or two small apertures in the top and the bottom of the case, so that it may be ventilated; then the moisture, as it becomes vapourised, can escape. In this case, a free current of air will probably exert a less baneful influence on the pictures than a continual humid atmosphere.

MR. BOUSFIELD, who recently brought orthochromatic photography before the Royal Microscopical Society, said he had employed these plates with growing satisfaction for some time. The objects represented were crystals of salicine displayed by polarised light, and the colours were purposely chosen to test as severely as possible—and a more exacting test could not be chosen—the capacity of the plates used. He found all to fail at the red end of the spectrum.

DR. CROOKSHANK'S exhibit was intended to show the teaching value of photo-micrographs, and consisted of enlargements on bromide paper

from negatives taken with the microscope, the objects being the flagellated protozoa in the blood. The amplification was seventeen hundred and fifty diameters, yet markings and histological details of great fineness were clearly portrayed.

THE photographs taken by the aid of the new apochromatic lenses showed the results of the combined action of both new objective and eye-piece. The actual photographs on view were not considered of very great excellence, but as exhibiting the power of the optical combinations were looked upon as most satisfactory.

It is expected that, socially, the Manchester meeting of the British Association will be one of the most brilliant ever held. A very large sum has already been subscribed, and liberal arrangements are being made for excursions and other entertainments. Sir Henry Roscoe, it will be remembered, is the President.

BICHIROMATED GELATINE EMULSION PAPER.

FOR the benefit of those who desire to try this method of printing with tissue or paper free from the difficulties which attend the commercial papers not specially prepared for the purpose, I will give the latest formula I have employed for the emulsion, premising that it is reduced to such a degree of simplicity and requires so little precaution in the matter of light during preparation, as compared with rapid emulsion for plate work, that any one can prepare it in an ordinary room and with full gaslight.

The requirements are a tolerably thick and perfectly soluble film of gelatine holding incorporated with it a minimum of silver salt, though, of course, the proportion of the latter will vary with the purpose to which the tissue is to be put. For positives on opal, or for transparencies, the quantity must be very small, but for the reproduction of negatives, especially for line work, a larger proportion may be used. The quality of the gelatine is of the utmost importance, and those samples which are held in the highest estimation for ordinary emulsion purposes are the ones to be carefully avoided for this. The so-called "hard" gelatines, in the preparation of which alum in some form or other is employed, are quite unsuitable, owing to the fact that the mere contact with potassium bichromate serves to render them more or less insoluble without exposure to light. In some cases the insolubility is complete, while in others, though only partial, the development requires the use of such hot water that all the finer gradations of the picture are lost. Nelson's "No. 1 Photographic" is an admirable brand for this and similar purposes, or a cheaper kind of the same makers known as "No. 1 Flake" is equally good if carefully filtered to free it from mechanical impurities.

In order to simplify, as far as possible, the manipulations necessary in making the emulsion, I have adopted Monckhoven's system of first converting the silver nitrate into carbonate, and then, after washing the precipitate to free it from soluble salts, incorporating it with the gelatine, afterwards converting it into chloride or bromide. This gives, without the trouble of washing the emulsion itself—always a tedious operation—a preparation free from the usual decomposition salts, though, when the emulsion is to be applied to paper, this is of less importance than is the case with glass, since the paper absorbs the salts and prevents, in a great measure, their surface crystallisation.

The formula stands as follows:—

Nelson's No. 1 gelatine	600 grains.
Nitrate of silver	70 "
Chloride of ammonium	20 "
Bichromate of potash	150 to 200 "
Carbonate of soda.....	9 s.
Water	to make 10 ounces.

First dissolve sixty grains of the nitrate of silver in a small quantity of water, and throw it down by means of about an equal weight of carbonate of soda, also dissolved in water. Allow the precipitate to settle, and decant the supernatant fluid once or twice, and finally drain closely. Let the gelatine be swelled thoroughly in cold water, and when the carbonate of silver is washed add to it a small proportion of the gelatine—say, one-fourth or one-sixth; apply heat, and when dis-

solved make up the quantity of emulsion to six ounces. Next add the chloride of ammonium, and stir well until dissolved, and at this stage, or later, the remaining ten grains of silver nitrate can be added and also stirred until dissolved. Place the whole in a warm place for an hour or so, or immerse for a shorter time in a saucepan of very hot or boiling water; finally, add the remainder of the gelatine and the bichromate of potash, and make up the total quantity of emulsion to ten ounces.

The resulting preparation will be of a deep red colour, owing to the presence of chromate of silver, which serves to render the tissue more opaque to light. It will be noticed that I do not employ hydrochloric acid to convert the carbonate of silver as would be done in Monckhoven's method; I thus avoid the inconvenient effervescence caused by the acid, and the carbonate of ammonia formed is afterwards decomposed more gently by the bichromate of potash. The emulsion, as will be seen, is very strong in gelatine, containing sixty grains to each ounce. This enables a good stout film to be applied to paper by simply floating, and the layer sets and dries rapidly, owing to the comparatively small proportion of water it contains.

Almost any sort of moderately smooth paper will answer the purpose for this process, as it only acts as a temporary support. It must, however, be a paper which, from its sizing, expands readily and evenly under the influence of moisture. Some papers partially sized with resin prove very refractory in this respect, refusing to lie flat when coated with warm emulsion, even though thoroughly wetted previously. Such must, of course, be avoided. Common wove note paper answers very well, as also does pretty good quality printing paper; the latter from its porosity separating from the picture on development with great ease. As an instance of the little care necessary in the selection of the paper, I have produced a print from a piece of tissue made on printed newspaper.

Coat the paper by floating for a minute on the emulsion, then adroitly draw off the sheet, and quickly lay it on its back on a level piece of blotting-paper until set, then hang up to dry.

H. Y. E. COTESWORTH.

ON THE USE OF THE STEREOSCOPE AND ITS SCIENTIFIC APPLICATION.

II.

IN applying the stereoscope to purposes of scientific investigation, it will be necessary for the observer to possess a good instrument of suitable pattern, to cultivate his powers of perceiving, by its means, the effect of solidity or third dimension of space as presented on the union of its two plane but dissimilar pictures, and to thoroughly understand the principle of the physiology of vision whereby the idea of solidity is produced in the mind.

In making choice of an instrument for normal vision with eyes of equal power, it would be well to select one of the lenticular form fitted with eye-pieces containing achromatised, prismatic, or whole lenses of about five inches focus, and mechanical contrivances for focussing and separating them to enable the sight to be exactly aided to the slightly varying circumstance arising in practice. For eyes of unequal power, or possessing other peculiarities not fatal to successful binocular vision, the mechanical features of the instrument might be similar if the powers of the optician, to suit the special requirements of the case were not limited thereby. It need scarcely be added that every advantage should be taken for optical skill to promote success, and make matters comfortable to the observer. It may be necessary to make modifications in the design of the instrument to admit of the examination of slides of unusual shape; but as these can only be settled when the necessity arises, it would be out of place to venture upon giving details here.

To cultivate the sight to ensure its possessing the requisite keenness and delicacy for noting the small variations in the amount of separation of parts of the same objects in the two halves of a binocular slide, and of seeing these alterations as differences of distance or as solidity, some simple drawing should be made like those that were supplied as slides when the stereoscope was first invented, and which usually illustrate articles on the subject. They consist principally of unsymmetrical geometric figures produced in pairs which, on being

viewed in various positions in respect of each other, as both placed the same way, or with their left or right sides to the centre, present the appearance of plane, raised, or hollow objects. Mere lines if not truly parallel are good exercises. These appear to extend from the observer into space either from the top or bottom of the slide, as their amount of separation is least at the one point or the other. The eyes, in travelling up such a pair of lines, and uniting them into a single one, must alter the convergence of their optic axes at every instant, exactly in the same way as when solid natural objects are viewed, the mind in both cases interpreting the changes of convergence as variations of distance. It will be gathered from these remarks, that any lines or points that may happen to be slightly displaced in respect of others will call upon the eyes to make this effort, and produce the corresponding idea in the mind that is to locate them in another plane in space nearer or farther, or their displacement makes them less or more widely separated.

Among the scientific uses of the stereoscope may be mentioned the well-known one of detecting forgeries of notes or cheques, because it is utterly impossible to copy or touch up a plate by hand sufficiently accurate to pass this test. It may be done well enough to deceive the unassisted eye. Let, however, the spurious and genuine notes be examined together, in the stereoscope, and their total unlikeness will be at once apparent, for their lines and figures instead of appearing in one plane will undulate to and from the observer in a ridiculous manner and immediately proclaim their origin. It would require a delicate and powerful micrometer to prove a difference that may be immediately made manifest in the stereoscope.

Some years ago the instrument furnished a very beautiful ocular proof of the spherical shape of the moon in Mr. De la Rue's photographs of that orb taken at different periods of her libration. In those arranged as binocular pictures which I had the pleasure of handling, the periods of libration seemed to have been slightly too far apart, the consequence being that the moon appeared more like half of an elliptical body viewed endwise instead of as a hemisphere. Another attempt (I believe it was so intended, for there was nothing to warn a visitor that it was not) to prove an astronomical fact was exhibited at the South Kensington "Loan Collection of Scientific Apparatus" among the photographs of a then recent total solar eclipse. In this case the slide was supposed to show the image of the dark body of the moon some distance in front of that of the sun, the effect having been produced by taking the pair of photographs composing the slide with a short interval of time between. The representation conveyed what happens to be fact, but the way in which it was produced was totally false and unscientific, proving nothing. The same illusion would have arisen had the sun and moon been mere discs sliding over one another in actual contact. To my thinking it was quite out of place in a scientific collection even as a curiosity, unless it were accompanied by an explanation.

One of the new (at any rate new to me) uses of the instrument I wish to suggest is in connection with photographic star mapping and the detection of motion or change of place of any individual star in respect of its fellows, by the comparison of two photographs of the same quarter of the sky taken at two different periods, the interval of time being long or short as the necessities of the case and practice may suggest. When two such photographs are viewed in the stereoscope all objects which had been what we usually call "fixed" would appear in one plane, while any that had moved during the interval between the dates of the photographs be they planets, planetoids, or comets, would stand out, as it were, in another. The plan, it appears to me, would be of much value if only as a rough-and-ready method of picking up objects possessed of their own proper motion for verification and study with the circles in the usual manner. It would also be some safeguard against reckoning defects as celestial objects if successive exposures were not made. The pair of maps would have to be examined in two ways upright, or let us say in the position they were taken for the detection of motion in right ascension, and then each turned round a quarter in the same direction to make evident any movement in declination.

As an aid to spectroscopic research, it is probable that the stereoscope might prove very valuable and reveal many new facts in making the comparison of spectra under various physical influences much more easy and certain than at present. A binocular spectroscope

would serve better for purposes of direct observation, but of course would be of no use for dealing with photographic records and no better than a single one for producing them. I am not aware whether such an instrument has been made, and as it does not appear to me that the difficulties of constructing one are insuperable, I mention it in conjunction with binocular slides and stereoscope, because I feel sure there is a field for both. Here is an instance in which either method would be of use. One of the problems connected with the spectrum of the sun is to settle which of its lines are due to the absorption of its own gaseous envelope and which may be set down to the contents of our atmosphere. To separate these two series M. Cornu suggests a plan whereby he takes advantage of the effect on the lines of the sun's revolution on its axis. As the lines (due to the absorption of his gas) on the spectrum of the advancing limb of the sun are for a well-known reason displaced towards one end of it and those of the same kind in that of the receding limb towards the other, while those produced by atmospheric absorption are not affected by the sun's motion but remain stationary, the spectra of these two portions when viewed alternately, but in rapid succession, will exhibit the lines in two series, one set appearing to flicker or tremble the other not. If two photographs of the solar spectrum were taken under these conditions and subjected to the stereoscopic test, the lines produced by the causes in question would be separated into two distinct planes of distance, capable of being leisurely studied and compared with the spectra of bodies produced by the electric arc or other suitable means. The photographs might be made in sections of any length, because it is easy to modify the stereoscope to admit of their being passed under review parallel to one another, the one for the off eye being started and kept two inches or so in advance of the other. I fancy I have described a stereoscope in these columns for panoramic slides that would be admirably suited to long photographs of the above kind.

I hope I have given a sufficient reason why the stereoscope should not be consigned to oblivion, but that as a scientific instrument for use by intelligent men it has a future before it nobler and more lasting than its day as a mere caprice of fashion.

JOHN HARMER.

ACCESSORIES OF THE LANTERN.

CHAPTER V.—SCREENS IN LARGE HALLS, &c.

In the preceding chapter (page 182) was described a set of eight screen poles, each four and a half feet long and one and a half inches in diameter, fitting together in fishing-rod fashion, so as to form two uprights capable of supporting a fifteen or eighteen-feet screen. The two upper rods of each upright may be of light wood, such as deal, but the lower rods, having more strain put on them when in use, are best made of a tough wood—oak, for instance. If they are made a quarter or half an inch larger in diameter deal may be used for all the rods.

Similar sets of uprights for screens of ten or twelve feet square may be cheaply made by using the common broom-handles, which are sold ready painted at about fourpence apiece. It is an easy matter to fix on the end of each a tin or brass tube five inches long, so that they will join together like a fishing rod. The rods or handles being about four feet long, three joined together will make a twelve-feet upright, and two of these uprights raised on chairs, if necessary, will support a small screen. They are not suitable for a fifteen-feet screen, as they bend to an alarming extent if more than three rods are joined together.

The way these uprights are used is as follows:—A rope or cord being procured about twenty yards long, the upper corners of the sheet are tied to the middle of the rope with tape or twine in such a manner that the stretching of the rope will fully stretch the top border of the screen; the sheet may be also tied to the rope at one or two places between the two corners, or, what is perhaps better, the rope may have been previously threaded through a couple of the eyelet holes. The upper border of the screen being thus attached to the rope, the next proceeding is to tie the cord to the summit of each upright, in which an iron screw-ring has been fixed, a distance being allowed between the poles and the corners of the screen of about three inches. The uprights, with the screen attached, are now raised to

the vertical position and separated the required distance, the two ends of the long rope are then drawn diagonally right and left respectively and attached to screw-eyes inserted in the floor at a few feet from the screen. This stretches the upper part of the sheet nicely; the lower corners may be drawn taut by means of cords attached to two extra screw-eyes in the floor. The screen, being now stretched at each corner, should be nearly free from creases; two or three extra cords tied to the eyelet holes where required will render it quite flat and even.

In large towns there are usually one or more halls of such size that ordinary screens erected in them appear quite lost in the immensity of space. A twenty-five feet screen is not too large for a hall one hundred and fifty feet long and sixty in height and width. When a hall of this calibre has to be dealt with there are, as a rule, special facilities for rigging up a large sheet; this is very fortunate, as it does away with the need of large and cumbersome screen poles, which, being too heavy for small screens, would be rarely used. The facilities referred to are the holes that are left in the lofty ceiling for ventilation and other purposes. Through two of these holes situated over the spot where the screen is to be, ropes may be let down to the floor; the operator below then fixes on the end of each a small pulley block through which a long rope is rove; the pulley is then hoisted up to the height of about thirty-five feet above the floor and the rope is made fast above. The cords which have been rove through the pulleys are then attached to the upper corners of the large screen, which may then be hoisted up by the pulley ropes and stretched taut in the same manner as when the wood uprights were used. In this way a large screen may be easily stretched by two persons in half an hour.

It will be observed that somebody has to climb up to the space between the ceiling of the hall and the external roof; this person is generally the hall porter, who does not at all like the ascending business. At a certain hall the porter said it was "worse than purgatory." He did not state how he obtained the special knowledge which enabled him to make the comparison, but a half-crown induced him to go through the ordeal. Excusing himself for a few moments, he presently appeared in a suit which was not his best, and then went aloft and fixed the ropes. After half an hour's work he descended, having apparently been luxuriating in a bath of soot, which rendered it needful for him to go home to readjust his toilet.

Lecturers nowadays so frequently employ the lantern to illustrate their discourses and to increase public interest therein, that in "lecture sessions," consisting of entertainments on a dozen different evenings, it is not uncommon for nearly half of them to be lantern lectures. There is consequently a tendency to make special provision for erecting screens in halls where they are often required, and, as this can be done at very small cost and trouble, it would be well if every hall were so fitted. All that is required is a small pulley permanently fixed at a suitable height on each side of the room; the best place in halls of moderate width is on the upper edge of the cornice. In wide halls, in which the screen can be placed close to the wall behind the platform, the pulleys may be fixed on this wall. The distance the pulleys are apart should be about equal to their height above the floor, and will depend upon the size of the hall; twenty feet would suffice for a hall sixty feet long requiring a fifteen-foot screen. The pulleys should each have a rope rove through long enough for the two ends to reach nearly to the floor. A small weight may be permanently tied to the end of each cord, so that if a rope end is accidentally drawn up out of reach the weight will bring it down again. When a screen has to be stretched, one end of each rope is tied to the top corners of the sheet, which is then hauled up by drawing on the opposite ends of the ropes. This method is perhaps as expeditious and convenient as can be devised; a sheet of any ordinary dimensions may be fixed up in this way in a few minutes.

When a lanternist arrives at a hall with his apparatus he usually begins operations by fixing up the screen; when this is accomplished he turns to his binnial and has to find out the right place to put it so that the imago will nearly cover the screen. If he guesses, the chances are that he is a few feet too near or distant, and when the hall keeper has surrounded the apparatus with long, heavy forms it is not a very easy matter to alter the position afterwards. Hence it is a good plan to measure off the distance of the lantern from the screen with a long

tape measure, having previously ascertained the required length; but a more convenient and equally effective plan, which does not require one to remember the exact number of feet needed for each size of disc, is to use a distance meter. This can be made in the simplest way by means of a piece of wood ten or twelve inches long and three-quarters of an inch square; to the centre of this tie firmly the end of a cord or narrow tape a yard long. The final adjustment is made during an exhibition of the lantern on a disc of the usual dimensions. A slide with an ordinary circular mat being inserted in the lantern and its imago thrown on the screen, the operator takes his stand close by the front lenses of the lantern, then holding the tape just under one eye and touching the skin with one hand, and holding the stick in the other hand in a horizontal position and parallel with the screen, he looks towards the disc with one eye closed, moving the stick between his open eye and the screen until it visually just covers the diameter of the disc; the space between the stick and the eye of the observer, probably about two feet, is then noted by means of the tape, which is knotted at that distance. Our simple distance meter is now ready for use in the next exhibition. The screen, which need not be of the same size as the one used in the adjustment, being duly stretched, the operator stands in the middle of the hall, and holding the knot in the tape in contact with the skin just under the eye he prefers to keep open, he holds the stick as before between his eye and the screen at such a distance that the tape is made taut, he will then notice how much of the width of the screen is covered by the stick; this being the diameter of the disc that would be shown at that distance, he will at once see if it is correct, if not he has only to advance or retire till he finds the right place to put the lantern.

This distance meter will suffice for any ordinary size disc with the particular focus lenses which were in use during its adjustment; if another set of lenses is used it will be necessary to readjust it, and to make an extra mark or knot in the tape for use with these lenses.

ALBERT WM. SCOTT.

PORTABLE DARK TENTS.

THERE is very little doubt that the "box" form of tent, such as is now in general use, is the best that could be devised. Rival forms are few and by no means formidable competitors from the point of view of general utility. The "umbrella" (both for changing and development) is obviously open to many grave objections which it would perhaps be invidious to enumerate, while the changing box that compels the operator to handle his plates per a pair of armholes, and watch his movements through a pane of ruby glass, possesses what, to the writer, appears a fatal defect in interposing a barrier between the visual orb and its objective. In transferring an exposed plate from the dark slide to a light-tight receptacle pending development, only a very slight amount of skill would be necessary; but in taking an unexposed plate from its original package and putting it into the slide, considerable uncertainty would exist in the average mind as to whether it had been turned right side out or not. This is surely a big nail in the coffin of the "armhole" changing box, for the presence of the least qualm in connection with such an important matter destroys at once whatever other useful characteristics the well intentioned piece of apparatus may possess.

Accepting then the box type of developing tent as the standard, and on the whole the most desirable for the purpose, one's remarks will necessarily be held as referring exclusively to it when dealing with the subject indicated by the title at the head of this article. Throughout the trade the words dark tent are taken to imply a similar concrete meaning. This points to the view that a consensus of experts are agreed upon the principle that what is, is best, in regard to the dark tent. Exception cannot readily be taken to this; it is only upon matters of detail that a fair quarrel can be picked with the makers. Some very peculiar notions as to the amount of space essential to the operations of development are in vogue amongst them. I have before maintained that anything under a 10 x 8 tent is practically useless. One made to this size permits elbow movement within a space two feet four inches by one foot seven inches; little enough in all conscience. One maker, however, thinks this a prodigal waste, for he offers us a tent which, though blessed with most exemplary qualities in the way of what reads like phenomenal portability and lightness, is utterly spoiled by the paucity of movement it allows; for I submit that a working space of eighteen inches by twelve is totally inadequate. True the flexible adjunct is said to increase that space to thirty-three and forty-eight inches respectively, but be it remarked,

only when extended on a table. Such a tent, however serviceable in a room, would be of little use in the open air, or on the deck of a ship, or, indeed, in any outdoor situation. My ideal tent is one that could be laid under contribution either in or out of doors impartially.

Elbow-room and plenty of it is always necessary when developing. So, too, is water. The method of providing a reservoir of this indispensable fluid is usually crude, and never satisfactory. A small tank, with a hole in the bottom, is placed on the top of the tent when open, over another hole, and the supply is obtained and regulated by a piece of rubber tubing and our old friend the American water-clip. I could never understand why this tank—flatter, of course, but of increased area—should not be fixed inside the tent. It might be supplied as now from the outside, and controlled inside by a small tap—a neater and handier arrangement than the tube and clip from all points of sight. I understand that some such improvisation has been adopted by one maker. In regard to shelf accommodation, our tent is, as a rule, rather too generously treated. This is the age of concentrated developers and percentage solutions, and all that is needed for the bottles is a small ledge with a thin wire rail to hold them in their places. Space might thereby be economised and weight avoided. Turning to the sink, little more than sufficient outlet for six ounces of liquid is needed, whilst it seems to me that the flexible tray might be dispensed with altogether, and a double frame, made to size, which, when clamped, makes the plate to be developed form its own bottom, substituted for it.

The question of ventilation in this connection is what Mr. Swiveller would term "a staggerer," for, at every turn, we are confronted by our old enemy, or friend, light. In my opinion, the current should come neither from the top, where, so far as I can discover, no attempt has, as yet, been made to improvise a method of ventilation, nor from the base, where, in one case, a small arrangement upon the fan principle has been tried with equivocal success, but from the sides, which at present, in most tents, are flexible. As before stated, the twill composing them is generally triplicated; if this were judiciously perforated at the opposite extremities of both sides of the tent, I think it would be found that some relief had been obtained from the intolerable stuffiness so much complained of now. More, if carefully done there need be no fear on the score of light. I believe this, or a similar dodge, has lately been adopted by one or two amateur workers.

Mr. John Morley recently prophesied the imminence of a quiet time in literature: I am bold enough to apply the vaticinal effort of the ex-Chief Secretary to photography, and to predict a sort of comparative *dolce far niente* throughout its domain for some time to come. It would be well, I think, if under such conditions a little of the feverish craving for chops and changes, which has characterised both sections of the craft during recent years, were turned in the direction of such neglected items—"without which no outfit is considered complete"—as the portable dark tent and other things of no pertinence to the present occasion. Cameras made for use with the wet process are no longer seriously thought of in connection with its dry successors, nor should portable developing tents originated under the first set of circumstances be any longer admissible under the second; the two cases are exactly parallel. The directions in which it is essential that the eye of the improver must turn, are—admitting that the form of the present tent is to be retained—that of a decrease of weight, readier susceptibility to external manipulation and internal convenience, and adaptability to modern needs. As I have before pointed out, substitutes for wood and twill are obtained easily enough, whilst if but a fraction of the ingenuity that is at present lavished upon far less important things were diverted to the emendation of the mere details of our tent, something really useful would, I am convinced, result. The matter is simply one of a little enterprise; the rest is all plain sailing and excellent profits.

MARSTON MOORE.

SPECIMENS OF WORK.

EVER since photography became a recognised art or profession, it has gradually become a growing custom for employers, when advertising for assistants, to insert a clause in their advertisement requesting the applicant to forward samples or specimens of his own work, whether in operating, printing, or retouching; and the question of the wisdom or otherwise of this system, though ever and again, and that at very short intervals, cropping up in the correspondence columns of this and kindred journals, has never yet, to my knowledge, been either fully ventilated or discussed. Operators who have complied with the request, and forwarded specimens of their work to an advertiser, have often complained of the delay that has occurred prior to their return; and in many cases the complaint has gone farther, it has, in fact, been alleged that when returned they have been in such a state as to be practically unfit to show again; and sometimes I have heard

operators, printers, and retouchers bitterly inveigh against the specimen system, because they had sent the only samples of their work that they possessed, which had never been returned at all, thus leaving them in a position utterly unable to comply with a similar request from another, and probably more honourable, source. Of course I am perfectly aware of the fact that no photographer of any standing, or with true feeling for his fellows, would wilfully detain for an hour more than necessary the specimens submitted to him by any applicant for work at his establishment. But pressure of other business matters, far more important to him, may, in many cases, cause the return of specimens of work to be overlooked or delayed for a time, or they may be kept back in case some other applicant who is being first attended to might not prove all that is required; and in either case the result is the same, the owner and producer of the detained samples has to allow some other vacancy to be filled, because, without his specimens, he does not care to apply for the berth.

One of the first and most important questions that occurs to me, and having a full and direct bearing on the whole question as to the wisdom of the system of sending specimens or asking for them, is how and when are *employés* to obtain the same? When a photographic assistant, be he operator, retoucher, printer, or all-round hand, is in what appears for the time being to be a perfectly comfortable and permanent berth, he is not apt to let thoughts of a possible and probable dark-to-morrow, when he shall be added to the already far too numerous list of the unemployed, in any way disturb his present feeling of equanimity and satisfaction; and even if he were, he would not, under the circumstances of the case, feel himself justified in asking his employer to allow him to have specimens of his work, indeed the very fact of asking for anything of the kind would be calculated to raise thoughts in the mind of even a moderately suspicious mortal (and photographers, be they employers or employed, are still but human) as to whether his assistant was not, after all, dissatisfied with his position and on the look out for another berth. Then, again, when a rupture has actually occurred, and the assistant is either under orders to leave or has himself given notice, even if he obtain permission to have for himself a few specimens, either by purchase or as a gift, it is not always an easy matter to obtain prints of the special subjects he wishes for, or even to remember the subjects themselves which would be the most suitable for the purpose he requires. Then there are employers, even in our own beloved profession, who are not all they might be as men, and who would flatly refuse to allow the operator or other assistant to have any specimens at all, in which case he must either stoop to dishonesty (perhaps, in this case a rather harsh term) and obtain them without asking, or he must state his case truly when applying for another situation, which would in many instances prejudice his chance of being the selected applicant; or a third course is open to him, he can obtain, by purchase, specimens of work, which he may be quite capable of equaling, or even excelling, but which are, nevertheless, no more specimens of *his own work* than if they were far superior to anything he might himself be able to produce. He may carefully select these, sending only such samples as may in every respect resemble his own work, as to lighting, posing, and general character, but still we cannot get away from the fact that he is literally and positively *not* the producer. Such a man would possibly fail to see anything dishonest or wrong in what he had done, he would probably bring to his assistance such casuistry as the following: "Specimens are asked of work that I can produce, and the specimens I am sending are such that I can equal, or even excel, at any time, therefore I am acting in a perfectly honorable manner." Argument of this sort notwithstanding, the fact remains, the plain, unvarnished fact, that those specimens are not his own work.

Passing by, for a time, the question of the difficulty or ease of obtaining genuine specimens of one's own *bona fide* work, we come to the question of the wisdom or advisability of submitting such specimens once they are obtained. There is no doubt whatever that there do exist certain dishonest individuals who make a practice of filling their show-cases with photographs not their own, and that to obtain these they do not scruple to stoop to very low means. Though if so designed, they can purchase any number of photographs that would answer their purpose, they often prefer to insert an advertisement for an assistant and require to see specimens; such specimens once sent are never seen again by the sender unless he happens to personally visit the advertiser with a view to obtaining their restitution, and then he probably discovers them being utilised as specimens of this man's *own work*. True, no decent photographer would act in such a dirty manner; but how, I would ask, is an assistant in want of a berth to know who and what an advertiser may be, more especially if he gives an address at a distance, or to initials, or an assumed name, or pseudonym at a false address? He has lost his specimens, and he cannot obtain more. What is he to do?

So much, at present, for the assistants' side of the matter; now for the employers. What security or proof has he that the specimens submitted to him are the genuine work of the applicant? He has only the bare word of that applicant himself, who may be a purely honorable man, who would not deign to stoop to dishonesty, or he may be the very contrary. He is at any rate an entire stranger, and the would-be employer is therefore utterly unable to judge of his *bonâ fides*. Such being the case, who shall say that the system of requesting and submitting specimens is in any way a wise one? For my own part I can look upon it in no other light than as a mere farce, one of those particles of red-tapeism that cling to most business transactions, and which requires only a vigorous onslaught and a free and impartial discussion to cut it away bodily and to render it a thing of the past.

It may be asked, if we do away with the specimen system, how are employers to judge whether the style or quality of an applicant's work are likely to be suitable for them? and this query may, I think, be readily answered. Why not make it a rule to adopt as a system, as in other professions and business, a term of probation or trial. I do not think that an assistant would, as a rule, object to go to a situation for a month's trial to see if he suited the employer, and the berth suited him; in fact, I believe it is even now the custom in some houses to do this, although specimens of work may have been first submitted, and I would contend that it would be much better for it to be done generally, as a substitute for the submittal of specimens. Taken shortly, the matter comes to this, an assistant is engaged after specimens of his work have been seen, and if he is not suitable, he does not even then stay, as a rule, more than a month, and he then considers himself aggrieved, as after his specimens having been approved, he himself is not; owing to the fact that a few selected specimens, however good, of any man's work, never can give a criterion as to his ordinary work either as to general quality or method of production. The specimens may be really first class as obtained in one studio, but on transference to another their producer may be utterly unable to produce anything to equal them, or his method of work may be found to clash severely with the method approved by his new employer. In such a case as this, it is the employer who considers himself the aggrieved person.

The month's trial would, to a great extent, obviate this kind of thing. The employer would, before engaging for that month, have heard from his new assistant's former employer what he considered his work to be, and he would further have, possibly, found out what was the general quality of the work issued from that studio which would undoubtedly be far more satisfactory than the submittal of any number or any quality of specimens, about the *bonâ fides* of which there might be some lingering doubt, possibly quite undeserved.

The general quality of the work issued by an applicant's former employer, when he has held the situation for any space of time, would be to my mind, and possibly to that of most people, by far the best criterion by which to judge his abilities. That work might not perhaps be exactly in the style or even of the quality which I should require, but still it would be sure to display certain characteristics which would show, to my mind, whether the applicant was likely to prove a suitable assistant to me. Personally, such being the case, I should engage him, and after the first month I should be able to see whether or no I had been mistaken. I say after the first month advisedly, as I do not consider an assistant can always fall into the working of any one particular studio in a day or a week, and if a little time is required better give that little time than change again and have to give it after all to some one else.

In short my whole argument is this, that the present system of sending specimens of work by photographic assistants is an utterly unsound one, and founded on perfectly erroneous bases.

C. BRANGWIN BARNES.

SULPHURATION OF PRINTS.

I do not propose to enter into the discussion as to the relative permanence of platinotype and silver bromide prints so much as to call attention to some points which, if overlooked, might be the cause of valuable processes being condemned in the future.

The first point that strikes me is that, if we are not careful, after Mr. Gifford's interesting experiments his tests upon the Eastman paper will get to be taken as representative of the permanence of any printing process in which the image is formed, or, rather, supposed to be formed, by the development of silver bromide. I say supposed, because we must remember that the way the Eastman paper is prepared is a trade secret, and there are several other papers in the market, each having distinct characteristics peculiar to itself.

Any one who has experimented at all in the preparation of silver bromide paper, I think, will agree with me that silver bromide alone will not give all the results which can be obtained with the papers supplied by the various makers. Therefore it ought to be a point clearly understood by photographers that because the Eastman paper came so satisfactorily out of the severe tests it was put to in the hands of Mr. Pringle and Mr. Gifford, it does not follow that all bromide papers will stand the same tests or would be equally permanent.

The degree of permanency of any print depends upon the least stable of the constituents of which it is formed, and it is of little use arguing on the basis that in the one case we have metallic silver only and in the other nothing but pure platinum, if all the time the images on the bromide paper consists of silver *plus* other unknown substances added to obtain a more pleasing colour, or if the platinum forms some chemical combination with the sizing of the paper to cause the deterioration of the print. One of the subjects in the late discussion was whether the paper itself is not part of the print, and I think that Mr. Pringle was quite right in speaking of it as such. In a photograph the depth of tone of the paper must be nearly as important as the deposit upon it.

However indestructible the substance on the paper forming the image may be, if any chemical compound has been formed in the paper support, which in time is the cause of destroying the purity of the colour of that paper, we speak of the print as having faded because the darkening of the whites and half tones have made the deep shadows appear by contrast less dense. I take it, that in speaking of a permanent photograph we mean that the range of tone between the purest white and densest black have been preserved to the same extent as when the photograph was first produced.

I can hardly gather from the sentence in Mr. Berkeley's article, "Let the statement go forth that some or many suppose that reduced silver prints will prove more lasting than the albumenised ones," whether that gentleman means to contend that the many are wrong.

If in any of the gelatino-bromide papers in the market there is any organic compound of silver added to the silver bromide to alter the colour of the image, then I should be afraid of them fading, but if they only consisted of silver bromide I do not think after development that we need fear the sulphuration of the metallic silver in ordinary atmospheres. Sulphide of silver is supposed to be about as permanent a silver compound as any.

Of course in albumenised paper we have an organic silver compound which rapidly fades under the sulphuretted hydrogen test, and in the case of the old development printing processes the papers were floated on a nitrate of silver bath, and in consequence we would still have organic silver compounds; but even then it was found that the developed prints as a rule stood better than the printed out ones.

But now I cannot see where an organic combination with silver can take place when an emulsion is made *with an excess of soluble bromide*. For that to be possible the silver must have a greater affinity for the organic matter than for the bromine, which would be present in excess of equivalent quantities.

I may say that I have been engaged lately in a series of experiments to endeavour to obtain, if possible, some idea of the probable permanence of the various printing processes of the present day, and more especially to see how much the fading under the various tests was due to the discolouration of the paper, and how much due to the destruction or change of the image upon it!

In common with most amateurs I always use permanent sensitised paper now, and I felt rather anxious as to the comparative permanence of those prints to platinum on fresh sensitised paper.

The next series of experiments was to find the difference between some of the bromide papers in the market and bromide papers of my own preparation, the constituents of which I knew to be only washed silver bromide and gelatine in different proportions.

The last series was to discover the power that these various prints would have of withstanding the destructive tests to which they were put when compared with platinotype prints, the unflinching permanence of which we have always been taught to consider an article of faith.

I must leave to a future communication the result of these experiments, but I wish to say that I undertook them solely for my own information, and that I have not the faintest possible interest either commercially or by prejudice with any process.

HERBERT S. STARNES.

DEVELOPMENT OF DRY GELATINE PLATES IN HOT CLIMATES.

THE following account of the system I generally follow in developing dry gelatine plates during the hot weather in Calcutta may be of interest to many readers of the ALMANAC living in tropical climates,

though it is only applicable to places where a supply of ice is obtainable.

In the first place, I do all my development, when possible, in the *early morning*, when the air is coolest. I have a supply of ice ready, and put half of it into the washing water in the developing room, reserving the remainder for the final washing. The plates are first wetted in a tray containing iced water, and meantime the stock developer is diluted with iced water and the plate developed. It is then well washed with the iced water, and placed in the alum bath, as usual, then again washed with iced water and fixed. After fixing, they are well washed for an hour or two with constant changes of iced water, pieces of ice being also placed in the washing box, and are then dried off as quickly as possible. Under ordinary circumstances good plates stand this treatment very well, and do not reticulate. When the temperature is much above 90°, only plates made with the harder descriptions of gelatine should be used.

LIEUT.-COLONEL J. WATERHOUSE, B.S.C.,
Assistant Surveyor-General of India.

RETOUCHING AS APPLIED TO COPIES AND ENLARGEMENTS.

THE difficulties presented to the retoucher, when working up negatives taken from some very old and faded photographs, are indeed considerable, and in most cases demand very considerable skill to succeed in producing a satisfactory result. Negatives taken the same size as the original will be found quite bad enough, but still more so are those enlarged from, say, the ordinary photographic *carte-de-visite*. They will have a very coarse quality and present a bad and granular effect almost invariably, which defects are naturally due to the texture of the paper in the original.

In retouching such a negative the first thing to be done is to decide what effect we are desirous to produce. If only to make the copy passable a slight amount of work may suffice; but, on the other hand, if we desire to make the best possible result, we will have a long and very wearying work before us. In such a case general effect rather than extreme fineness of touching should be our aim. I say this because a retoucher with taste can produce a soft effect which will yield a good printing texture with comparatively a small amount of work, whereas should he try to thoroughly get rid of the grain of the paper a very long and complicated work lies before him. Besides, the result will, even then, be anything but commensurate with the amount of skilful labour expended upon it. To aid in getting this soft effect the retoucher should keep his eye as far as convenient from the negative while working it, as he will thus lose the offensive character of the grain more readily.

If it be possible to have the original as a guide while working by all means have it. It will be a great help when putting in the lights, and aid us in avoiding the danger of exaggerating them. Of course any exaggeration in this regard would tend to give the appearance of hardness, whereas all our efforts should be given to the production of softness. Having made up our minds as to the treatment of the texture of the paper, we, of course, would then proceed to the general retouching of the face, which would be carried out in a similar manner to that of one taken direct from life.

The reproductions made from the old Daguerreotypes will be very much less exacting and troublesome, for the mere reason that the negatives in these cases will be quite free from all texture, owing to the quality of the polished silver plates. All Daguerreotypes show a bright surface to the light, and will, therefore, lend themselves to the process of reproduction much more satisfactorily than would an old and faded silver print. Indeed, it will be found that nothing beyond the ordinary modelling and general softening will be required. I have seen many negatives taken from such pictures give a much better result than the original. As I say, the face will be all right, but often the figure will not stand out from the background. This defect will not be so visible in the reproduced negative, as there will be much more contrast than in the Daguerreotype.

There are many difficulties in the way of copies of oil paintings. I have had one very notable case some years ago. It was a life-size portrait of a lady wanted copying. Quite a dozen negatives, varying from quarter to whole-plate sizes, were taken, but all seemed most horrible. For some time no one could see the reason for the markings in the negatives. The painting was a very smooth work, most finely and carefully done, highly glazed, and showing a good surface for photographic purposes. Indeed, really good negatives were taken, but the face was very badly seamed with dark markings running across it from right to left. At last it was found that the

varnish had turned yellow in parts and hence all our trouble. This we thought could be easily altered by asking permission to remove the varnish and have it done afresh, but this proposal did not meet with the approval of the owners of the picture, who said if it could not be photographed without touching the original they would not have it done at all. There was nothing, therefore, but to have the negatives most carefully worked up. This was done, and the pictures turned out successfully. In such cases care must be taken to preserve the likeness and not interfere with the drawing. This is no easy matter where so much has to be taken away.

The difficulties in the way of copying oil portraits, or indeed any other class of pictures, are not so numerous or troublesome as they were some years ago. Mr. Dixon has shown us some wonderful results with his orthochromatic plates, and negatives taken by his process will not require anything like the amount of work demanded by a negative taken in the ordinary way. These plates do not altogether do away with the retoucher's work, but they more than cut his labour in two.

In many cases it will fall to the retoucher's lot to alter the background of a portrait—if it be too dark, to lighten it, and if on the contrary it be light and should be required darkened, we must be prepared to do it. In a case where it is too dark and we desire to lighten it, the simplest way is to coat the back of the negative with either a white or yellow varnish, give it a few moments to evaporate, and before it becomes quite dry run a line all round the figure with a penknife, and then remove the varnish from the figure, only leaving it on the background. This will cause the background to print much lighter. In taking away the varnish it will always be better to leave a little line behind the figure than to take away too much. Should it be only one side that requires lightening, use the ordinary matt varnish, and then take a stump charged with plumbago and work on the part or parts requiring to be lightened. This done be sure to soften the edges well by rubbing with the finger or a clean stump, as failing to do this we may leave a defined marking which would completely mar our picture.

If, on the contrary, we have got a very light background, and a dark one may be desired, or some offensive piece of furniture may require removing, we must proceed in a very different way. In such a case put the negative in the retouching desk, then with a very sharp and pointed knife cut away carefully round the figure. In this way, if desired, we may completely cut away the entire background, or leave us such portions as will enable us, with the brush and pencil, to put in any fresh background and accessories that may seem most appropriate. Great care must be taken should the face be profile, as the least false touch would ruin the picture. In such an operation the arm should be firmly fixed, so as to avoid the chances of slipping and perhaps taking a piece out of the face of the picture. The knife, too, should be extremely sharp, and if used by a steady hand the gelatine film can be cut down and still never come to bare glass. Many retouchers use a needle fastened in a piece of wood to scrape away the background surrounding the figure and face; but, personally, I have always used the knife, and it has always rewarded my confidence in its powers. If the artist be skilful, a negative can be so treated, and a background put in with the pencil and brush that will look quite as though it were the original one. With the gelatine films of to-day it is much easier to avoid a hard outline round the figure than in the old collodion plates long ago. Indeed, the former lend themselves completely to the use of the knife. It is a matter of no moment to cut down the offensive lights that might show on the negative of a lady dressed in black velvet or plush. I refer to the unfortunate wrinkles and light that often show about the bust of a lady, and which may be the result of bad posing or carelessness.

There is another manner of stopping out a background, and that is by masking it. But this has many disadvantages, not only in the difficulty of doing it properly upon the negative, but also in producing prints fairly alike afterwards. However, by a judicious use of these hints, a great deal may be done to make a picture, if not absolutely so, at least passable, that otherwise would be simply impossible.

In all reproductions or enlargements the prevailing fault is flatness and what may be termed want of light and shade. Even in life-size portraits the judicious use of the stump may produce a light upon a face that will make a success of the picture. These lights are not so very necessary where the copies are printed in carbon as they are in plain silver printing. In the former they can be all rubbed out in the *print* and brilliancy thus secured, but the silver print would be quite flat, and nothing would possibly alter it.

Having said so much about the manner of obtaining *lights* in a copy or enlargement, I must say a few words about what is of quite equal importance, that is, the deepening of shadow. Many times in copies and enlargements the shadows are very weak and devoid of all quality

from a printing point. This, however, can be materially altered. The lines and markings, too, in people advanced in years, the texture of the face, &c., are far too harshly marked in the enlarged negative. All these, however, can be much softened, and almost taken away, by printing through tracing paper over the negative, and so interposing a certain thickness of tracing paper between the negative and the sensitised paper.

When doing a negative like this, say a 24×18 size, I always strain tracing paper on the reverse side of the negative. It will serve a double purpose, inasmuch as it not only softens the printing, but is a first-rate medium for working upon with either stump or pencil to strengthen the high lights. I can also by its means deepen the shadows of drapery, or other objects that may require treatment.

To do this I make up a bottle of varnish made of one drachm of Canada balsam and one ounce of benzole. I dip my brush in this and pick out the shadows I wish to strengthen upon the tracing paper. The Canada balsam making the paper considerably more transparent in the places touched by it, the light acts more quickly, and necessarily ends in greater depth of shadow being procured upon the print. The distance the paper is from the film thoroughly softens the edges that might otherwise exist. In this way, with care and skill, a good picture may be obtained of a copy or enlargement from a most unfavourable negative.

REDMOND BARRETT.

MISCELLANEOUS SUBJECTS.

PROFESSOR HOUGH'S EXPERIMENTS ON DEVELOPING-ROOM ILLUMINATION.

THE recently published experiments by Professor Hough, of Chicago, on the relative visual and photographic intensities of red and yellow lights, are in the right direction, what is required being the reduction of the various elements of the problem to figures, leaving nothing to the imagination; I wish, however, that he had used the pure colours of the spectrum, and not the colours of commercial products liable to vary with every specimen. He employed the cloths known as "golden medium" and "cherry medium," with a sperm candle behind each, then tested the fogging power of the light, but he does not carefully describe the conditions of his experiments. Assuming him to have used but one or two thicknesses of these cloths, he was in reality employing a proportion of white light for development. Let a piece of the yellow bookbinders' cloth known as "golden medium" be held between the eye and the sun, it will be seen to be full of small holes freely transmitting white light; put it under the microscope and transmit sunlight through it, dozens of holes will become visible for every single hole seen by the naked eye, and the patchy nature of the colour will become manifest. Three thicknesses of the cloth are necessary to get anything like a surface even in translucency and colour, but then a stronger light than a sperm candle is desirable; so in the absence of information to the contrary, my assumption is that Professor Hough was not testing yellow light, but a mixture of white and yellow. As a practically efficient screen, I recommend three or four thicknesses of dry tissue-paper of a bright sunflower yellow colour, placed between two sheets of common glass, and made to form a lantern window not less than a foot square; behind this, at a distance of nine or twelve inches, have a stearine candle flame; the best hard stearine is cheap and does not gutter. Professor Hough acts upon Fraunhöfer's measurements of the luminous intensity of various parts of the spectrum, but his measurements are antiquated; there are others of later date and more exactitude, made also with the diffraction spectrum, in which spectrum the colours are spread out in proportion to their wave lengths, and are not squeezed together at the red end.

What is ordinarily termed a "safe light," is not necessarily the best for developing; there is more comfort in developing with an unsafe light + brains, that is to say, with a practical knowledge of how enormously the fogging power of a light diminishes with increase of distance and under varied conditions. It is easy to develop with a candle down in one corner of a moderately large room, and to apply the developer at the farther corner, with your back turned to the candle, but directly that candle is covered by the flimsiest of yellow screens, the safety of such "development by distance" is considerably increased. By a still farther application of the principle, I like a yellow lamp of large luminous uniform-surface, the light from which is practically unsafe in developing operations at six inches distance; there is then plenty of light in the room, safe to work by, but not near the lamp at particular times and angles of development. The more sensitive the plate the farther from the light should it be when it is taken from its slide and put into the dish, but to do this a good light is not necessary. After it is in the dish, and the developer is over it, it has become at once less sensitive to fogging influences from

at least three causes: firstly, because of the immediate action of the developer upon the surface of the film; secondly, because the plate cannot be tilted to a great angle to the light and receives vastly less of the luminous intensity per square inch; and, thirdly, because some of the incident light is reflected from the surface of the developer, and never reaches the plate at all. Under such conditions the plate may perhaps at once be brought within the six-inch unsafe distance without fogging; this but furnishes an instance of the frequently misleading nature of the testing of the safety of lights by means of plates in a dry state held at right angles to the luminous radiations.

Another point of incompleteness in the experiments by Professor Hough is that he employed but one brand of plates in his experiments, and those were of the "lightning" description. Very rapid plates have been publicly stated to be more sensitive to yellow rays than those which are slower, and except for special purposes I think that few experienced photographers care much for lightning plates. A variety of plates should have been used in the experiments.

In London a proper yellow light is now extensively used for development, and going back to red light is talked about as one misfortune likely to result from the increased employment of orthochromatic plates. I suspect that the most comfortable way of developing the latter may possibly be by brains rather than by what is usually called a "safe light." By the study of the effects of light at certain angles and distances I expect that yellow light may hold its ground, or that a compromise may be effected by utilising the orange rays. Those orthochromatic plates which are not much sensitive to the red rays, consequently are not particularly orthochromatic, will most favour the use of red light in development.

Some persons in London were having their eyesight injured by working in ruby light, and the trouble was removed when they took to yellow. I can quite understand a bad yellow light being worse than a good red one when tested, and surmise that Professor Hough took yellow screens full of minute holes transmitting white light, and compared such yellow screens with red glass.

OPTICAL NOVELTIES.

A few days ago Lord Rayleigh exhibited a curious experiment at the Royal Institution. He said that our sensation of colour is three-fold except in the case of colour-blind persons, whose vision is two-fold; to normal eyesight all colours whatever can be produced by suitable mixtures of the red, green, and violet of the spectrum. He then proceeded to make yellow by mixing green and red. He projected a spectrum upon the screen by means of the electric lamp, then interposed in the path of the rays a glass trough which cut off all the rays more refrangible than the green, leaving only the red, green, and yellow. He next took another trough filled with alkaline solution of litmus, which, when used by itself, was seen to completely obliterate the orange and yellow rays. When the two troughs were used together, only pure red and green rays passed through them. He mixed these rays, and a full yellow, inclining to orange, was the result. Doubts have often been expressed whether mixed red and green rays will make yellow, and Lord Rayleigh told those present that when they reached home, and were told that red and green will not make yellow, not to believe the statement.

Quite recently, also, some novel experiments were brought under the notice of the Physical Society by Mr. C. V. Boys. He made some glass filaments finer than those of spun glass, by heating the glass more, and drawing it out at higher velocity than by the glass-spinner's wheel. Straw arrows, some five inches long, shot from a cross-bow, were made to draw out the glass, which was first heated by a small oxyhydrogen flame. A filament forty or fifty feet long was made at each shot. By this method he drew also threads of garnet, quartz, ruby, and other materials. The fine quartz filaments had the full strength of steel, their breaking strain being about fifty tons to the square inch, and some of them were so fine that they could not be seen under the microscope except as diffraction bands. He built up a diffraction grating by fixing short lengths of glass filaments side by side upon a piece of glass at the rate of two hundred and fifty to one-tenth of an inch.

W. H. HARRISON.

WHERE I WENT WITH THE CAMERA.

TO HARWICH, THENCE TO ROTTERDAM.

No. I.

WHITE-MELVILLE, in his *Holmby House*, says, "Photography, forsooth, is no invention of this nor any other century. It came with mankind fresh and perfect upon earth. When Adam left the garden and knew he should see it no more, he took with him into the dreary waste of the outer world an impression of his paradise that had not faded when his

eyes were dim and his years had numbered nine hundred one score and ten. Eve, too, carried another in her aching bosom, though she could scarcely see it through her tears. Their children one and all possess the art and its appliances." I fear it is going a little too far back to credit Adam with a permanent picture of the Garden of Eden. It reminds one of that story which turns up every now and then of the murderer whose villainous features were found faithfully portrayed in the eye of his dead victim, and by this mysterious evidence was tracked, taken, condemned, and executed.

As I sat reading these first impressions and photographic operations by Whyte-Melville's method, I pictured to myself how Adam would have looked clad in his verdant garb moving about, posing, and taking groups of all the animals wherewith the garden was so plentifully supplied; then looking down at my traps as the train sped on I thought, "It's a long time ago; things are different now; we don't take pictures on sensitive hearts. We use gelatine plates, and our method is much more troublesome." And yet there is something to be said for Whyte-Melville's process, for no matter how many negatives we make upon a journey, pictures upon pictures that we cannot so take will be impressed upon the tablets of our memory, that we may perhaps give word sketches of, but never print from plate. A psychological photography, for which no patent can be had.

On my way to Harwich for Rotterdam, to make the journey easier I dropped in upon a friend and stayed for a day at his place. I took several groups. I took himself, his wife, and his house, and packing them carefully, brought them away with me. When there I heard a good story about this house my friend inhabited which is worth telling.

After the labours of the day were over, as my friend and I were sitting in the dining-room enjoying a smoke, my attention was attracted to a really fine enlargement hanging over the chimney-piece. "A good picture that," I remarked, pointing to it.

When my friend with a smile replied, "Yes, and it has been a good picture to me more ways than one."

"How?" I inquired.

"Well, strange to say," he began, "it's in connection with this very house, and that long before I had any idea of being its proprietor. There was an artist residing here at the time I speak of, and he was the sort of man that got into debt with everybody, and would pay nobody."

"What do you mean? Was he hard up, or what?"

"I do not know why he should have been hard up. He had lots of work to do, and it paid well; but no one that he was indebted to could get money out of him. I did not know of this peculiarity in his character, and as luck would have it I unwittingly lent him a good round sum. After waiting some time I tried to get my money, but in vain, so I resolved to give the matter into the hands of a bailiff. I called upon one with this intention. When he knew what I wanted he said, 'It ain't any good, sir. I can't do it. I've been a-trying to get into that man's place for months, and can't no way.'

"How is that?" I asked.

"He's too dead fly, that's what he is," replied the officer with a knowing leer. "Why, the gas company could not get their account no way, and they thought to get the best of him anyhow. So they wrote him that on a certain day they would break open his door and take away their meter, and by this means would get into the house, and take possession for their account."

"And how did he get over that?" I asked.

"Oh, easy enough," he replied. "When we went to take away the meter it was waiting for us on the front doorstep."

"We must get over him somehow," I said, with determination. "I'm not going to lose my money."

"Look ye here, sir, it's just wasting money. I have now an account o' Slasher & Co.'s for forty pounds odd. I've been a-prowling around that place for months, and it ain't no good. He's too dead fly, I tell ye. You never find him a opening of that door; he puts up the window and speaks to you there, but you don't get no nearer."

"We'll have a try, at any rate," I remarked, as I left the baffled officer. "I'll see you again shortly."

"So I came home, thought the matter over, and after arranging a plan in my own mind, took down that very picture and carefully sewed it up in green baize. After that I had my friend the bailiff to do himself up as much as possible like a dealer in pictures. I then had my picture taken down to the railway station and put into the left luggage office. I knew that my artistic friend had correspondents and friends in Reading, and I had in my possession a visiting card of a personal friend of my own who resided near there. When the train from Reading came into the station I had the officer ready with a friend on the job to take the picture out of the left luggage office, hire a cab, and drive to the artist's house. Arriving there, the cabman was sent up to the house with the card. The window was thrown up, and the wary one called out, 'Well, my man, what do you want?'

"Two gents, sir, here with a picture," said the cabman, touching his hat. The cabman was perfectly innocent, you know, and he handed the card in good faith as he said, 'They want you to come down for it, sir.'

"Where do they come from?" asked the painter, suspiciously.

"Station, sir. Reading train just in."

"Well, go and fetch it up," said the artist, not moving from the window.

"Won't let me, sir. I asked to. Said it was too valuable."

"The cabman's manner evidently gave confidence to the cautious one, for he ventured to open the door, and come down the garden to the cab. He asked a few questions, which seemed to satisfy him.

"This picture," said the officer, 'is of considerable value, and it must be very carefully handled. It has to be cleaned and restored, and we have been recommended to you as a gentleman who will do the work satisfactorily if you would undertake it; but it's no use our lifting it out unless you see your way to do it.'

"This seeming carelessness allayed his suspicions. After a little reflection he said, 'Well, bring it up to the house.'

"Carefully the cabman and the officer carried it up, and entered the door.

"Put it down in the hall," said the artist, as he stood behind them ready to shut the door as they went out.

"Laying down the picture, the bailiff turned to the cabman and said, 'There's your fare; send up that other fellow here.' Then taking off his hat and wig, and turning to the artist with a leer, he said, 'It hasn't been an easy game, governor, but there is no blooming error, I'm on the right side of the door at last.'

"Sold, by heavens!" exclaimed the artist, livid with rage.

"You see you dare not break into the house," continued my friend, "but when once in you can hold possession till you get your money; and you know in this case the bailiff could open the door to all and sundry that might call for accounts. So he was obliged to be got rid of. The two accounts were paid in full within an hour."

"That was smart," I said, as I again looked up at the picture with the history.

Next day I reached Harwich, and at night took boat for Rotterdam. It was very dark. When we started nothing could be seen but here and there a few flickering lights that reflected and moved in the water like wavelets of gems. On churned the steamer through the mirk, and as I stood leaning over the bulwarks smoking the pipe of peace and peering out into that black gulf of seeming nothingness, I thought, "This night—all night—every night all the year round, thousands and thousands of human beings are moving on the bosom of the mighty waters, coming and going, going and coming; weaving the stories of lives, warp or woof are they; protecting the interests of countries, plotting the downfall of empires, building histories; each one with his motive, pleasure or profit, bringing in his trail love and joy or hate and misery, heavy hearts and light. The hopeful and the hopeless all over the world are moving on the ceaseless waters—this night—all night—every night for ever and ever." To weave another thread into the pattern of the story of my life, I went away down to bed.

When I got up in the morning, I found we were steaming up the River Maas. The morning was cold, grey, and misty, and the first look out upon the borders of this new country was novel in the extreme. The low lying table-land flat and uninteresting; the little clusters of houses built in every conceivable style, form, and colour; the knotted, grotesque willows, and sersggy vegetation, all impressed me with the idea that the place had been laid out after the plan of the imported toy-box—a whole-farm-for-one-shilling, sort of thing. By-and-by the sun came out and brightened up the scene, all the picturesque effects flashing out in a moment, lighting up the little houses, the little trees, the little canals, the little bridges, and by that one magical touch of sunshine a charm was lent to the scene, rendering it quaint, curious, and interesting. We now slow to let the Custom House officers come on board, and the luggage is brought together for their inspection. I had some doubts about my photographic plates, so I went on to the upper deck and stood looking over the rail at their progress, till they were nearly done. One of the officers looking up at me then asked if I had no luggage. Oh, yea, I had luggage, and I brought it. I explained about the plates which they handled suspiciously, only for a moment, and then pressed them carefully. The only thing that seemed to bother them much was my tripod stand—it was a new pattern with a good many screws, and I had it fixed in the middle of my bundle of rugs, the two ends protruded exposing all these screws. They stood wondering what sort of a machine it could be, and evidently making up their minds that it was something infernal, until I explained their doubts away, and then they were happy, and so was I. I cannot pass here without tendering a word of thanks and praise to the Customs officials all over the journey, for, on an explanation, they did everything in their power to protect both plates and negatives, and I never had a moment's trouble or uneasiness.

Oh, the delicious leisure with which these Hollanders do anything and everything. After the hurry and worry of life at home it is perfectly charming. The boat gets alongside the quay; by-and-by they begin to think that we would be the better of a gangway put across so that we might be able to get ashore, and so they set about it. From a windlass they unwound a chain with a hook on the end, which is put into an iron loop fixed in the gangway; in trying to lift the gangway, out comes the hook, and away awings the chain right across the deck within an ace of breaking three or four heads, and actually knocking down three or four boxes. With a broad smile, a long "Yah!" and a slow, decided foctall, the Dutchman goes on his way r'joicing, catching up the swinging chain, readjusting the hook, and after ten minutes of slowly

winding, the gangway is safely placed across a gap of three feet. Then, with some promptitude, I thought that I would let them see how we did it, and tried to hurry up the slow ones with my luggage. Getting into the 'bus, I ordered the driver to make all haste for the city; but really it wasn't much good, the driver mistook noise for speed, and he kept yelling to the horses all the way, but they knew better, and would not be hurried, but trotted on in their easy-going way, taking no notice of the driver whatever.

MARK OUTE.

THE HISTORY OF PHOTOGRAPHY.

On Friday evening a lecture upon the history of photography was delivered in the Lecture Hall, Tower-street, Ipswich, by Mr. William Vick, in aid of the funds of the children's wing of the East Suffolk Hospital.

Mr. Vick spoke of the invaluable service photography rendered to all sorts of people; nothing came amiss to it, from the most gorgeous eastern temple to the last new thing in bonnets, and nothing in all the records of science had in forty years obtained such world-wide appreciation. The germ of photography—the dark room—was discovered by Porta in the second half of the sixteenth century. His camera obscura was a room into which the only light admitted came through a small hole in the shutter. The effect of light upon certain chemicals was accidentally discovered by an alchemist, who one day threw some sea salt into some nitrate of silver and thus formed chloride of silver, which had the quality of turning black when exposed to the light. Mr. Vick showed how chloride of silver was formed by pouring some salt into some nitrate of silver. If that was taken into daylight it would become black. Professor Charles made the first use of this with the dark room. In giving lessons to his class he exhibited some startling experiments. By means of a strong solar ray he threw the profile of a member of his class upon a piece of white paper covered with chloride of silver, which took the impression in white upon a black ground, to the amazement of those present. But the impression was not permanent, and the effort to obtain something which could fix it occupied the minds of many scientists, amongst them James Watt, of steam engine notoriety. In 1826 M. Daguerre, the inventor of the diorama, and M. Niepce, each of whom had made experiments in that direction, entered into partnership and worked in common to fix the image afforded by the camera. Niepce discovered the use of mercury and iodine of silver, but died before the work was finished, and Daguerre was left to carry it on. Daguerre worked on, and eventually, with Isidore Niepce, the son of his former partner, formed a company and brought out the Daguerreotype process. This they transferred to the Government, Daguerre receiving a pension of £6000 and Isidore Niepce one of £4000 in return. Mr. Vick showed the working of the Daguerreotype apparatus, which he had with him. To have his portrait taken by the process a man had to sit for a quarter of an hour or twenty minutes. He did not know what people would say if asked to sit so long now. It often happened that inventors, having once invented a thing, could develop it no further and died poor, while others who came after and improved the invention reaped the fruits of their labour and died rich. Daguerre gave the world the first rudiments of photography, but his genius could take him no further, and he had to leave it to others to develop the art. Collodion, as a coating to receive the impression, which was discovered by Mr. Scott Archer, revolutionised photography and was in use for about thirty years, but now it had been displaced by gelatine. Many other things were sensitive to the effects of light in this way, and even a deal board was capable of receiving an impression. Whatever might be said against photographers it would not be denied that they took a deep interest in their work. One of their most frequent sources of complaint was that sitters would not allow them to do their best to turn out an artistic portrait but would impose absurd restrictions, which they would never think of doing if they were going to have their portrait painted by a celebrated R.A. Several amusing instances of this were shown in views upon the screen; of the lady with the snub nose who wished to be taken in profile because the portrait of some pretty young lady friend taken in that way was "so satisfactory;" of another lady, with eyes all akimbo, who insisted upon being taken full face "as if she was looking at you;" of the gentleman with a pair of legs rather bent and not at all elegant, who would be taken standing; and one with a particularly long pair, who would be taken sitting. Very much had to be done by tact and equanimity of temper. Only the other day a man complained to him that one side of his face was taken darker than the other, whereas "he was not born so." To argue with a man like that upon the question of light and shade would be like casting pearls before swine. Several anecdottes of the comic side of the art were also narrated, and a copy of Du Maurier's picture in *Punch* of the photographing of the firstborn was shown upon the screen. If they wanted to try the patience of a photographer let them bring the mother, grandmother, aunt, father, grandfather, uncle, and a few others, and set them all to amuse the baby whose portrait was to be taken. During the siege of Paris, 1870-71, the pigeon post was very largely used. The messages were reduced by photography and fixed inside a quill, which was fastened to a feather of the tail of the pigeon. When the bird reached its destination, the message was taken into a darkened room, and with the aid of the oxy-

hydrogen microscope thrown in magnified size upon a white sheet upon the wall, while the reporters sat at a table and copied it. It was possible for one pigeon to carry about 3,000,000 letters of the alphabet in that way, and more than 100,000 despatches were sent into Paris during the siege. Photographs could be taken upon wood, and also upon silk and textile fabrics, so that if they wished to mark a handkerchief so that they should know it again, they could have their photograph put in the corner. In conclusion, Mr. Vick gave a practical demonstration of the rapidity with which a permanent photograph could be developed. He developed a negative in the usual way, and passed it to the gentleman in charge of the lantern, and the portrait of Jim Frost, the well-known Ipswich crag vendor, was thrown upon the screen, the whole process having lasted only a very few minutes. He also took a number of prints upon pieces of textile fabric. He was warmly applauded at the conclusion of his lecture.

SNOWSCAPES.

LIKE the man who could not see the town for the houses, the photographer who waits for leafy June before he begins to take landscape views will not be able to see the country for the foliage. When heavy shade trees overshadow all picturesqueness, we sigh in vain for light, since we know, alas! how imperfectly our sunbeam pencils sketch in the dark. Hence these days of early spring tempt us to leave lantern slide making and transparency work, that we may discover what a wonderful light reflecting medium is the white snow. Maybe it has already begun to melt in patches, yet surely there is enough left for our 4×5 and 8×10 pictures. We imagined winter had laid nature bare, but instead we find he has covered her with ermine fit for ears, and hung every twig with pearls and diamonds. This is a magic world; one hour the fields are as solidly white as the whitest coated dry plate, the next as wet as the wettest plate of old process days. Here a view of melting snow gives us a Niagara in miniature, and again ten feet of ice glisten in our camera like a mile-wide river in a skating carnival.

If only for scientific experiment, it is interesting to note what swiftness of plate and shutter snowscapes require, the maximum of light being as great as at mid-ocean. Again, artistic amateurs will be delighted to find twenty objects, such as cowshed and wood pile, made beautiful as picture material when covered with snow; and since fashion has made certain old-time sports famous, any one who wishes to turn an honest penny into needed acid or plates can do nothing better than to photograph a toboggan party. Or to choose simpler material, let him shoot at our street gamins as they race down hill on their long "bobs." Better yet, since work makes hay of life, will be the realistic view he can take of the same lads dragging their heavy sled up the steep slide for a second dash. Sometimes gallantry will have led them to give some little sister a ride up hill; more often some work-shirking boy—destined to get free passes on the railroads by-and-by—will be seen lying face downward on the high board seat, and in either case the additional figure will give an interesting feature to the picture.

Children grouped about a rudely made snow fort make good subjects for the home artist, who simply wishes a suggestive portrait of Charlie or Tom; a single figure rolling up a big snowball; a plough making its slow way through shining drifts; an unbroken wintry road; a crusted lane; verglas on maple boughs against a background of dark evergreen trees; all give delightful bits as new to photography as midsummer landscapes are old.

To outing lovers, iceboat racing, groups of skaters and trotters are pleasing, but less observed scenes, such as the breaking up of our frozen river in early April, make more original pictures. A 4×5 view of one huge ice-boulder crashing up against another; a black pool between them; a curve of snow-crusted pebbly beach beneath, blue sky above, has all the feeling of the Rhone glacier about it; yet only fishermen spreading their shad nets note these common everyday sights.

Snowscapes are specially attractive when finished on rough bromide paper, where soft blackness and whiteness lends itself to the chance-like sketch. It is against the printed rules, yet a certain Christmas-card sparkle and glitter, inartistic but realistic, is obtained by adding a few additional drops of iron to the developing solution.

For all this outdoor work avoid taking cold, as well as views, by choosing a day when the mercury is above 40°; there are plenty ahead of us before the grass grows green. Wrap up warmly; the focussing cloth may be worn as a black cloud around the ears, and as far as possible make all preparations before leaving home. Also remember the advice given to tourists last summer. Before setting out with tripod or detective bag choose your view, make your appointment with the sun and keep it. It may be said, for the less hardy among us, that many beautiful scenes can be taken from one's own window—views which are sometimes pronounced "too dreadfully dreary and lonesome" by those who, having eyes, yet see not, but which are very charming to the artistic amateur.

Avoiding, then, those zero days when the most highly advertised slides will not pull for frozen fingers, let us choose a mild thawing noonday before the April sun has wasted the snow quite away, and secure pictures of ice-palaces, glaciers, and toboggan slides, the very sight of which shall cool us when we frill and blister next August.

ADELAIDE SKEEL.

—Anthony's Bulletin.

FAREWELL DINNER TO MR. W. K. BURTON.

ON Wednesday night, March 30, a farewell dinner was given at the Holborn Restaurant, London, to Mr. W. K. Burton, C.E., as a token of the esteem in which he is held by his friends, and as a farewell meeting before his departure to Japan, where he will occupy the post of Professor of Sanitary Engineering in the Imperial Institute at Tokio. Mr. W. H. Walker, of the Eastman Film Company, presided. The company numbered about fifty.

After the usual loyal toasts, the Chairman said, as an American, he once had never expected to meet Mr. Burton, who was well known to him by his writings, but of late he had numbered him among his few personal friends; he was both surprised and pleased at the great honour of having to occupy the chair that evening. No writer upon photographic subjects had greater influence over photographic readers than Mr. Burton. He then proposed the toast of the "Army, Navy, and Reserve Forces."

Mr. A. B. Brown, of Edinburgh, responded for the Navy, and Mr. A. Pringle for the Army, which he said he had entered as a drummer and retired from as a trumpeter. The army with which he was now connected was the noble army of photographers.

Mr. J. Traill Taylor read letters from Mr. W. S. Bird, Mr. O'Farrell, Mr. Howard Farmer, Mr. S. McLellan, Mr. Coeking, and others, who from illness or other causes were unable to be present.

The Chairman then, in the name of a few friends, presented to Mr. Burton a chronograph and gold chain, as a small memento of the esteem in which he was held, and to show how they appreciated his abilities and his kindly and genial nature; he hoped that every tick he heard from that chronograph would symbolise to him a pulsation from the heart of every one present that night.

Mr. Burton responded that the Chairman had spoken of him beyond his deserts; what had been done that evening had more than pleased him, for it had affected him to see so many present who had come out of good feeling, and all of whom he recognised as good and true friends of his own; he saw present fellow-schoolboys, fellow-apprentices, fellow-workmen, and his former master, Mr. A. B. Brown, whose presence that evening he considered a great honour. In addition he saw present a great number whose friendship he had made through photography, the subject which was nearest to his heart, for he had loved it more than any other pursuit. He heartily thanked every one present, also those who had been unable to attend. In a few days he had to begin a journey of about 12,000 miles to a far country; he should remember those he had left behind, and bear with him the magnificent present which had come upon him quite as a surprise when he accidentally heard of it for the first time that morning. He knew that those who were absent had good reasons for not attending, and he should remember all his friends until he was able to return to this country once more.

Dr. Thomson said that he was the oldest friend of Mr. Burton present that evening; he knew him when he was in petticoats, twenty-five years ago. He was the son of a very distinguished father, who occupied a high position in the literary world, and held an important official position in Scotland.

Mr. Taylor said that Mr. Burton had descended from good old photographic stock; he was the grandson of the late Professor Cosmo Innes of Edinburgh, who had been an indefatigable worker of the paper processes a quarter of a century ago.

The Chairman proposed "The London and Provincial Photographic Association," to which Messrs. Ashman and Prestwich responded.

To the toast of "Professional Photographers" Mr. A. L. Henderson responded.

The Chairman proposed "Landscape Photographers," coupled with the name of Mr. Bedford, who, in responding, said that his friend Burton would be very much missed indeed in the photographic societies; in London he had held a thoroughly independent position in photography.

Mr. Taylor proposed "The Photographic Convention of the United Kingdom."

Mr. J. J. Bringinshaw returned thanks, saying that the Derby hantling had grown into a very healthy condition, and he hoped to see a large party at Glasgow next autumn.

The Chairman proposed "The London Photographic Club," coupled with the name of Mr. Foxlee, who briefly responded.

The toast of "The North London Photographic Society" was coupled with the name of Mr. A. Mackie, who remarked that it was the youngest of the photographic societies, but it did not interfere with the work of any of the others, as it treated photography from an elementary point of view, and proposed to give elementary lectures to amateurs and beginners.

In response to the toast of "The Camera Club," Mr. H. J. Gifford said the Club had sprung up, he might say, almost wholly from the influence of Mr. Burton.

Mr. Taylor then proposed "The Photographic Society of Great Britain," coupled with the names of Mr. W. England and Mr. W. E. Debenham.

Mr. William England, Vice-President, hoped that Mr. Burton would have a prosperous journey; they all would be glad to see him on his return.

Mr. W. E. Debenham said that it was the oldest Society and had done good work in its time; he believed that all societies had their waves of greater and less usefulness, and he hoped that the Society would have

great usefulness in the future. There was a melancholy tinge in that meeting, as they were about to lose their friend Burton, and his coming back was a long time off. His distinctive character as a writer in the photographic journals was that he did not make experiments and keep them to himself, but he gave away good experiments combined with literary skill. He hoped he would continue to experiment when in Japan.

Mr. A. B. Brown proposed the health of the two photographic journalists, Messrs. Taylor and Bolas, both of whom briefly acknowledged the toast.

Mr. C. Heinrich Trinks proposed a vote of thanks to the Chairman, who was a foreigner as well as himself. His experience was that Mr. Burton's work was well known on the Continent, and that he was appreciated there as a thorough and earnest worker.

The Chairman returned thanks.

Mr. B. J. Edwards asked the company to wish Mr. Burton a safe and pleasant voyage out and home, after which the company separated at a late hour.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 4718.—"An Improved Photographic Camera." C. CUSWORTH.—*Dated March 30, 1887.*

No. 4725.—"Improvements in Focussing Arrangements for Photographic Cameras." T. N. ARMSTRONG and G. MASON.—*Dated March 30, 1887.*

No. 4804.—"Improvements in Slide Carriers for Automatically Centering and Quickly Changing Slides in Magic Lanterns." Complete specification.—W. J. COLES.—*Dated March 31, 1887.*

No. 4808.—"Regulating and Fixing the Horizontal or Vertical Swing of Photographic Cameras." C. SANDS and J. J. HUNTER.—*Dated March 31, 1887.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
April 12.....	Newcastle-on-Tyne & N. Counties	Coll. of Physical Science, Newcastle.
" 12.....	Manchester Amateur	Masonic Hall, Cooper-st., Manchr.
" 12.....	Derby	Sykes's Restaurant, 33, Victoria-st.
" 12.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 13.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 14.....	Birkenhead	Free Public Library, Hamilton-st.
" 14.....	Bradford Amateur	Grammar School.
" 14.....	Cheltenham	4, Clarence-street.
" 14.....	Halifax Photographic Club	Mechanics' Hall.
" 14.....	Manchester Photo. Society	39, George-street.
" 14.....	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, March 31, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. A. Pringle presided.

Mr. S. G. B. WOLLASTON said that he had seen in print a misrepresentation of a remark of his as to the solvent action of glycerine on gelatine; he had never said that it would dissolve chrome-almed gelatine or that it had a solvent action at all; he had merely stated that when certain gelatine films were obstinate in coming off their supports the addition of a little glycerine would make their separation a comparatively easy matter. Film photography had of necessity advantages of its own; it had been to him, as a peripatetic man, an incalculable boon to be able to take a few spools and no developer with him when travelling, and to obtain with certainty twenty perfect negatives out of every twenty-four exposures. In the packet before them he had sixty paper negatives, all oiled, yet the packet weighed less than ten and a quarter ounces, and its bulk was small. Financially films would hold their own against glass, and if desirable they could afterwards be transferred to glass, as he sometimes did, for it would not do to put flexible negatives into the hands of young assistants, damage being the certain result. Owing to the enterprise of the Eastman Company, M. Thibaut, Mr. Pumphrey, and others, film photography had become possible, but to him practically the list had been reduced to the first two. The density of images upon Thibaut's films could not be judged by transmitted light; truly the films might be intensified, but intensified negatives were never perfect; therefore he found himself reduced to the Eastman stripping film. Those who took up film photography would have to unlearn much that they had learned previously in developing images upon glass; with films he thought that it was almost imperative to give up ammonia development; ferrous oxalate worked with them extremely well, but the use of one of the fixed alkalies was better still, the development then being more under control. Towards the close of development he would sometimes add a little ammonia to give crispness, if necessary. Eastman's films might be used as ordinary negatives by those who did not care to take up the process in its entirety. He exhibited an 8x5 negative upon an Eastman film, then treated a glass plate with French chalk, followed by a coating of tough, plain collodion thinned down, and to which a minute proportion of castor oil had been added; to this prepared plate he intended subsequently to transfer the film. The speed of the films was twenty-two, and in a few cases twenty-five, by the

Warnerke sensitometer. Ordinarily he developed three, six, or nine at once in large dishes. His developer consisted of—

<i>Solution A.</i>	
Pure sodic sulphite	6 ounces.
Distilled water	40 "
Pyrogallol	1 ounce.
Citric acid	½ "

<i>Solution B.</i>	
Pure sodic carbonate.....	4 ounces.
Ordinary water	40 "

Solution for Use.

One ounce Solution A, two ounces water, and one ounce Solution B } Maximum, five drops ten per cent. solution of bromide of potassium to the ounce.

The developed films had to be squeezed down upon the prepared and washed glass plate already described, and the paper would strip off, especially when that operation was facilitated by the presence of a little glycerine in the water. The speaker developed in a bright yellow light, which he said that he had found not to fog the images. He said that he was careful not to expose the developed negative to white light until it had been washed for some minutes, otherwise it acquired a yellowish colour and printed slowly.

Mr. A. HADDON remarked that the only difficulty about the process seemed to be the obtaining of the paper. When did the Eastman Company intend to send more over?

Mr. W. E. DEBENHAM said that the distortion of photographs due to the unequal expansion of the paper when wet, and afterwards drying the film upon a rigid surface, made the process before them imperfect for portraiture, though it might do for landscapes.

Mr. W. H. PRESTWICH asked if parchmentised paper could be used.

Mr. W. M. ASHMAN asked if any one had tried solution of gold size for varnishing flexible films.

Mr. A. L. HENDERSON thought that Mr. Ashman had made a very wise suggestion.

Mr. H. A. BRIDGE said that gold size dissolved in turpentine made a perfectly waterproof varnish.

Mr. DEBENHAM did not think that intensified negatives were always of an inferior character.

Mr. WOLLASTON wished to qualify his remark on that subject by substituting the word "seldom" for "always."

A vote of thanks was then given to Mr. Wollaston with acclamation.

Mr. WOLLASTON responded that it was a pleasure to demonstrate before an auditory like that, who could appreciate the points. It was not the same with a company of amateurs and ladies, which caused the speaker to finish with a kind of sinking of the heart. He should go away with a very kindly recollection of his reception by the Association.

Mr. HENDERSON exhibited and described a detective camera brought over by an American amateur, and made, he believed, by the Scovill Company, of New York.

The HON. SECRETARY said that it much resembled one exhibited by Mr. Watson.

The proceedings then closed.

CAMERA CLUB.

THE lantern slide exhibition (the last of the session) at the Camera Club on March 31 was the most varied that has yet been given. There was a crowded attendance.

Mr. C. B. WRIGHT sent three sets of slides—views in Norway, pictures in North Devon, and photographs of ruins on the Riviera after the late earthquake. The English series included some very picturesque effects, particularly *A Misty Winter Morning*.

Mr. F. DUNSTERVILLE sent a further instalment of slides of Indian subjects, mainly showing various classes of natives. These excited very great interest.

Mr. FRITH exhibited a very varied selection, including views of Greek and Egyptian ruined temples and pictures of home scenery.

Mr. W. BROOKS showed and explained the peculiarities of some interesting work done five-and-twenty years previously, and

Mr. FRANK HOWARD made a few remarks on the printing-in of clouds in lantern slides, illustrating his description by the exhibition of some combination transparencies done by Mr. Breeze many years ago and by a selection of his own work.

Mr. George SMITH showed a few very fine Woodbury slides of microscopical subjects and general work, and Mr. GALE exhibited studies of picturesque English landscape with figures.

Dr. G. LINDSAY JOHNSON explained a new microscopical attachment for the lantern.

The subject for Thursday, April 14, is *A Demonstration in Photo-Micrography*, by Mr. T. Charters White.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held on Thursday, the 31st ultimo, at the Royal Institution.—The President, Mr. George H. Rutter, in the chair.

The minutes of the preceding meeting were read and confirmed.

The following gentlemen were unanimously elected members of the Association:—Captain L. Ching, R.N.; Messrs. W. J. Davey, G. W. Guy, and H. R. Marsden.

The SECRETARY acknowledged the gift to the library by a member of two copies of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC and three of the *Photographic News Year-Book* to complete the library sets; also the photographic journals from the respective editors.

Proofs of the presentation prints for 1886 were exhibited, being 15 x 12 enlargements, executed in carbon by the Autotype Company, of *A Cheshire Lane*, by Mr. A. W. Beer, and *Doorway at Tabley Hall*, by Mr. J. H. Day.

Mr. GEORGE E. BELL, of the Air Brush Manufacturing Company, Rockford, Illinois, exhibited the action of the air brush, and in the presence of the meeting executed in five minutes a large head resembling fine crayon work. The facility with which he worked and his dexterity were much admired. He afterwards explained the construction of the instrument, which is very ingenious.

The competition for the lantern-slide prize was then proceeded with. There were five competitors, who had sent three slides each, which were projected on the screen by means of the Society's limelight lantern, the judges being Messrs. Atkins, Boothroyd, and Sayce. The result of the competition was that the set bearing the motto "Black Diamond" were adjudged to be first, and those with the motto "Gone" second. It was ascertained on opening the envelopes that Mr. A. W. Cornish was first, thus gaining the silver medal, and Mr. A. W. Beer second. The judges also highly commended a slide by Mr. Riley.

The two hundred American slides sent by the kindness of the Camera Club were then exhibited, and excited a great deal of interest, from the novelty, in many cases, of the scenery depicted and the general excellence of the slides.

Some slides were afterwards exhibited, the work of Messrs. Grillon and Faltin; and after passing hearty votes of thanks to Mr. Bell and the Camera Club, the meeting terminated at a late hour.

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

A PUBLIC meeting of the above was held in the lecture theatre of the Literary and Philosophical Society's Institute, Newcastle, on the 11th ultimo,—Mr. James Downey in the chair.

Certain business connected with the exhibition came up for discussion. Mr. THOMAS M. LAWS (who acted for the evening in place of Mr. Pike, the Hon. Secretary, unavoidably absent) proposed, and Mr. LYDELL SAWYER seconded, "That a label not exceeding three inches by one and a half inches, containing the title of picture and name of exhibitor, be allowed on the front of each exhibit, also that the Hon. Secretary write to each exhibitor notifying above." Carried unanimously.

The slides sent in for competition were then shown on the screen and the CHAIRMAN announced Messrs. Gibson and Auty as winners of the first and second medals.

There was a large attendance.

The next meeting will be held in the College of Science on Tuesday, the 12th instant, when Mr. Jackson, of the Eastman Dry Plate and Film Company, will give a demonstration of the Eastman stripping films.

HALIFAX PHOTOGRAPHIC CLUB.

THE monthly meeting of the above Club was held in the Mechanics' Hall on Thursday evening, March 24,—The President, Mr. Councillor Smith, in the chair.

After the formal business of reading the minutes and balloting for new members had been taken, Mr. George Hepworth read a paper and gave a demonstration in connection with the platinum process. There was a large attendance, and the subject proved to be one of special interest, and a somewhat exhaustive discussion took place upon the question of the permanency or otherwise of pictures produced by this process, and the opinion was given unanimously that if the instructions issued by the Platinum Company were carried out as they ought to be, there was not the slightest doubt the results would prove to be absolutely permanent, the paper itself being the most perishable element in all probability.

A very fine show of pictures was placed in the room, a collection being sent by the Company and by members of the Club.

Tylar's metal slides, and Hinton's photographic labels, were shown and favourably commented upon.

Correspondence.

"A NEW LANTERN SLIDE CARRIER."

To the Editors.

GENTLEMEN,—Mr. Hepworth's letter in your last impression is apparently another proof (if such were needed) that two persons engaged in similar pursuits, and suffering similar inconveniences, occasionally hit upon similar means for remedying them. The idea was certainly original with me in February, 1884, and Mr. Hepworth having made some carriers on the same plan in 1883 does not in any way affect this fact. In my previous letter I said the idea was not new, and Mr. Hepworth's letter confirms this. The magnanimity conveyed in the last part of that communication (with reference to the "*lapsus memoria*") is very refreshing; only as I could not possibly have forgotten what I never knew, it scarcely applies to—Yours, &c.

F. A. BRIDGE.

April 4, 1887.

PHOSPHORESCENCE.

To the Editors.

GENTLEMEN,—On pages 722, 739, and 753 of your valuable paper (vol. xxxiii), are some communications relative to phosphorescence phenomena observed in the dark room. I have this day, for the first time, noticed the light, and it was so astonishingly brilliant that the subject seems to me well worthy of investigation. My present communication is merely to state the conditions of the experiment.

I was developing two 5 x 8 plates in an 8 x 10 ebonite tray, and on transferring one of them to a large porcelain tray, containing at least a half gallon of water, in which a single 8 x 10 plate from the alum bath

had been soaked, the whole surface of the plate was instantly covered with a lambent light, which disappeared as the plate passed beneath the surface. A Japanese gentleman happened to be with me at the time, and as I transferred the second plate in the same way, he also clearly saw the phosphorescence. As that was my last plate the experiment could not be repeated.

My developer was pyrogallol with potassic carbonate and sodic sulphite, but without bromide. The water in the large tray contained only the small quantity of alum that was carried in the film of the 8×10 plate. The alum solution from which that plate was taken was strongly acid with oxalic acid.

The plates were made at Passavant's Dry Plate Factory, San Francisco, Cal., U.S.A., and I may incidentally remark that there are no better plates to be found.—I am, yours, &c.,
R. HIRCHCOCK.
Osaka, Japan, February 12, 1887.

THE OWNERSHIP OF THE NEGATIVE.

To the Editors,

GENTLEMEN,—Perhaps you will kindly allow me one word on the question of the ownership of the negative, raised by the letter of Mr. Debenham, of Ryde. I have been a photographer since 1854, and all these years I have never seen the question fairly put and fairly discussed. Photographers discuss it from their own point of view; they please themselves. But their view of the question is a most selfish one. Printers' types and photographers' negatives are not alike.

The negative, I consider, belongs to neither photographer nor sitter, but in the interests of both it ought to be destroyed. Photographers, be they ever so eminent and ever so successful, have received ample pay for their work; they have had their own charge, and ought to rest satisfied with it. Granted the plate belongs to the operator (which it really does not, for he has charged for it), the image upon it does not. He has only arranged in a pleasing form, and fixed that which belonged to and was placed upon it by the sitter. The value of the image and the value of a plate ought not to be compared. Why should a photographer arrogate to himself to be the custodian of treasures so highly prized by his clients? Are not negatives sometimes sold? and by whom? See advertisements in journals.—I am, yours, &c.,
FAIR PLAY.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

GRIMSBY.—We cannot name any brass turner who would make such a mount, although we are aware of some who have got such work done.

M. P.—Your best plan will be to make your wants known through the medium of our advertisement columns. This will no doubt secure what you require.

LINDSAY JOHNSON.—The description of the glass mentioned has not appeared in this JOURNAL, but we believe it was published in the *English Mechanic* about two months ago, more or less.

HOME RULER.—Either of the doublet lenses mentioned may be employed as a single landscape lens by removing the front combination. The focus will be about double that of the lenses when used intact.

H. WALKDEN.—Apparently you require detailed instructions in mounting on glass; therefore we refer you to Mr. Armstrong's article entitled *Optical Contact*, on page 118 of our ALMANAC of last year.

S. S. S.—For taking houses close to the camera employ a wide-angle lens with a small stop. The same lens employed with the largest diaphragm may be used with a drop shutter in a bright day and on well-lighted subjects.

GREENHORN.—If the front lens be placed in the back cell with its flat side towards the front, and a diaphragm with a quarter of an inch aperture be placed at not less than two inches in front, the definition is certain to be good.

A. G. C.—Although unable to say what brand of paper the print is upon, yet will it be quite easy to obtain as stout a sample from any of the large houses. Almost any kind of toning bath will yield a similar colour, more especially if ammonia fuming be adopted.

ANNOTT writes: "Will you kindly answer, through your 'Answers to Correspondents' column how I can test soda carbonate crystals for purity?"—The only plan is by volumetric analysis. If Abbott is not proficient in chemistry he had better procure the salt from some reliable source; he can then rely upon its purity.

OFFICE asks if there is any means of finding out whether a photograph has been registered or not within a few years. "One I wish to inquire about is a portrait of a gentleman (name is known, also the photographer's name)."—Yes, it can be ascertained by searching the records at Stationers' Hall. This must be done personally.

A. J. JONES, of Moss-side, writes, denouncing the accuracy of the report of the Manchester Society's Lantern Section so far as regards the utterances attributed to himself. Instead of saying that he "did not use the dissolving tap" because the high pressure was too great a strain on the dissolving tap, he avers that he stated just the contrary.

A. BROWN says: "As my studio is lighted from the east and the sun is getting troublesome, I should like to try the method of softening the light recommended by Mr. T. Protheroe on page 139 of this year's ALMANAC, but have been unable to procure the kind of paper; I shall be much obliged if you can tell me where I can get it."—The paper recommended can be obtained from most wholesale stationers who make fancy papers a speciality. Perhaps Mr. Protheroe will kindly favour our correspondent with the address of the house from whom he obtains that he employs.

S. HOLMES.—The developer you employ is strong in an almost ridiculous degree. Instead of using a saturated solution of protosulphate of iron, try a developer composed as follows:—Protosulphate of iron, a quarter of an ounce; acetic acid, one ounce; alcohol, half an ounce; water, eight ounces. After all the details are out, with as much vigour as can be obtained, an increased degree of density may be given by washing off the developer and applying:—Pyrogallic acid, four grains; citric acid, three grains; water, two ounces; to which are added, at time of using, two or three drops per ounce of a fifteen-grain solution of nitrate of silver.

GRIMSBY, referring to Mr. Harrison's article on the *Education of Photographers' Children*, and on *Guines, near Calais*, as a favourite place for English parents to send their children, says: "As a photographic assistant of twelve years' standing—who has received a foreign education, part of which was received at Guines—I wish to warn parents against sending their children there, as of the several schools in that town, not one is of any good. The instruction imparted at these establishments is a mere 'farce,' utterly worthless, as I soon found out, and had myself removed to a Government 'Lycée'—where, if one stops a number of years, a sound education is imparted."

LOTO writes: "I should be glad to know if anything can be done to save a negative with which I have had an accident. I dried it by means of alcohol, and, feeling convinced it was thoroughly dry, I put it in the printing frame, and on going to look how it was getting on I found the paper had stuck to the film so firmly that not even by washing for hours could I get it off, the result being the negative is one mass of little brown spots, precisely like a rash, which no treatment I know of has done any good. The negative being a good portrait, I am anxious to save it. Can anything be done?"—From our correspondent's letter we fear the negative is irretrievably ruined. Perhaps, however, the spottiness can be removed with a dilute solution of cyanide of potassium. This is the best remedy we can suggest.

G. FORTESCUE says: "A photographer here has taken a portrait of our minister, and is selling copies, but, as they are not marked copyright, I have copied one and am selling the prints. He is threatening to take proceedings against me, and I have written to him asking when he made the portrait copyright, and why the portrait is not marked as copyright on the mount, &c., and he declines to answer, still threatening proceedings. Can he take any?"—Certainly he can if the portrait is copyright. The owner of a copyright is not bound to answer any questions on the subject except in a court of law. Anyone who pirates a picture does it at his own risk and must take the consequences of his act. If the picture be copyright our correspondent should feel thankful to his neighbour for giving him notice to desist from the piracy instead of taking immediate proceedings.

PYRO writes as follows: "Some time ago I took the negative of a friend who gave me permission to sell copies of his portrait. Of course when he gave me this permission he expected that those who bought them would put the portraits to their legitimate use, by placing them in their albums, &c. One day a man came in and bought one, but instead of putting it to this use he has had a transparency made for the lantern, and he now uses the transparency for the purpose of throwing ridicule upon my friend. As I did not take out a copyright of the portrait I cannot prevent the man from having it copied, but can my friend make him desist from exhibiting his portrait. He objects to the exhibition, and has written me asking if the law would not compel the exhibitor to withdraw it on his writing to him and demanding its withdrawal. If so, and he does not withdraw it, what course should my friend pursue to compel him to cease this exhibition?"—So far as we can see, the only remedy is by injunction from the Court of Chancery. We are not sure that one would be granted, but no doubt it would if the aggrieved party could show that it held him up to ridicule or caused him annoyance. A respectable solicitor should be consulted.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The ordinary meeting of this Society for April will not take place on the usual second Tuesday, but on the third Tuesday, April 19.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—Excursion on Easter Monday to Maidenhead. The train leaves Paddington at six minutes past ten a.m. Members will meet on the departure platform.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, April 13, 1887, will be *The Development of Drop-Shutter Exposures*. The Bank Holiday outing will be at Radlett, from Moorgate-street and St. Pancras, returning from Barnet.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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GELATINE PLATES FOR COPYING LINE SUBJECTS.

OFTENTIMES the photographer is called upon, perhaps at short notice, to copy a document or plan which is wanted as evidence in the law courts, and in connection with which no time must be wasted. In these days of the almost universal employment of gelatine plates, he probably finds himself somewhat at a loss how to proceed in order to obtain a moderately fair representation of the original, for though for such purposes a great amount of artistic and technical excellence is scarcely required in the reproduction, still, with the general run of rapid gelatine plates and development modified within usual bounds, it is difficult to produce anything which will satisfy the photographer that he is doing justice to his client.

We know several professional photographers in whose way occasional commissions of this and kindred sorts fall, who keep a silver bath and collodion always at hand for such occasions, but we all know that a bath only used at rare intervals or by fits and starts is very liable to be found to be out of order just when required. The carefully prepared operator is thus as likely to find himself as really unprepared as he who gives no thought to that class of work. To doctor the old bath or to make a special new one are remedies which scarcely commend themselves to a man in a hurry, and he is therefore almost driven to do his best with the other means at hand—gelatine plates.

Of course it is quite possible to prepare gelatine plates for the special purpose which will give results in black and white quite equal to wet collodion, and which may be used for the most difficult of tasks of the sort, namely, the production of negatives for "process" work. But such plates are less likely to be found in the ordinary studio than collodion and bath. Besides which, we are not aware that any of the plate manufacturers at present turn their attention to plates of this description, and few professional photographers, or even photo-etchers, are likely to lay themselves out for their preparation, preferring to resort to the old bath.

This latter is, we believe, almost if not universally employed for all "process" work, and yet the importance of being able to use gelatine plates is to the photo-etcher almost inestimable. How often has a negative to be made at a time of day, at a season of the year, or under weather conditions, when even the best wet plate is almost useless, though gelatine with its greater rapidity would do what is required if only the necessary density could be obtained. Even the comparatively slow plates specially prepared for density would prove immeasurably superior to wet plates if they were but at hand, but if the

ordinary "rapid" or "instantaneous" films could be utilised, the benefit would be still greater. A method of development which provides this *desideratum* must therefore be of value.

The ordinary methods of treating a rapid gelatine film when more than usual density or contrast are required are scarcely applicable, except to a limited extent, for our present purpose. Increasing the strength of the pyro solution produces the desired effect with most plates when ordinary half tone subjects, whether portrait or landscape, are in question; but the effect is not pronounced enough to be of much value where the extremes of clear glass and absolute opacity are required. Increasing the proportion of restrainer with or without a modification of the exposure will have a decided influence in increasing density, as well as contrast for half tone subjects; but in the reproduction of fine line work, it not only loses its effect in that direction if pushed beyond a certain point, but the transparent lines of the negative are filled up by the lateral spread of the development. Bromide of potassium (or other soluble bromides) employed as restrainer retards development in a surprising degree up to a certain point, especially when employed in large proportion; but a time comes when, no matter what the strength of the restrainer, it appears to entirely lose its influence, and the less exposed, or even unexposed, portions of the film become amenable to the reducing action of the developer, and are in technical language "fogged." This limits the application of bromide to the purpose under notice, though with the usual classes of subjects in cases of over exposure, or when more than ordinary contrast is required, the practice is a safe one.

Casting about recently for some means of acquiring density with a batch of extremely rapid plates, which proved quite useless from the extreme thinness of image, we resolved to try the effect of gallic acid as restrainer in the manner recommended some two years or more ago (vol. xxxi, page 501). It was found that gallic acid, when used in conjunction with alkali, not only possessed no developing power, but when added to alkaline pyro behaved as a most powerful restrainer, far more powerful than bromide in retarding development, but without the same effect on exposure. The experiment was made with a fair amount of, though not with absolute, success, so far as the particular sample of plates were concerned; but receiving about the same time an inquiry on the subject of density in line negatives our attention was diverted in that direction, and the following is the result of our experiments.

We may premise that plates of several different makes were used, and the modified treatment produced results that varied

directly with the normal characteristics of the individual plates. Thus plates which naturally gave density with tolerable ease were affected to a greater extent than those whose tendency laid in the direction of delicate images. Thus Rouch's and Edwards's plates proved more amenable to the gallic acid treatment than Wratten's "drop" shutter and Paget's, though both the latter gave results quite suitable for ordinary line work, though not dense enough perhaps for photo-etching or lithographic work.

In the first experiments the ordinary developer recommended with each plate was employed, only substituting for plain water a one-grain solution of gallic acid. The difference here was chiefly confined to a very considerable prolongation of the time of development, without anything like an adequate accession of density, though certainly there was a difference in that respect, and more especially in the clearness and crispness of the transparent lines.

The changes were rung upon many modifications of this treatment; the proportions of pyro, bromide, and ammonia, were varied, as well as the strength of the gallic acid. The exposures were also considerably lengthened; but though all these modifications produced a corresponding influence upon the result, still the prolongation of the time of development was the most noteworthy feature, and out of all proportion to the benefits derived from the treatment.

We next tried soaking the plate previous to development in solution of gallic acid, and this proved a decided advantage. A three-grain solution of gallic acid was made and filtered, and into this the plate was plunged for half a minute upon removal from the dark slide. One minute and two minutes were first tried, but the shorter period of thirty seconds proved sufficient. Upon removal from the gallic acid bath the plate was immersed, without washing, in the developing solution. This was composed at first according to the instructions issued by each maker, but eventually we found that under the circumstances these formulæ were by no means the most suitable, what was required being a solution strong in alkali and well restrained.

Accordingly we settled upon a universal formula for all plates, containing in each ounce of developer three grains of pyro, three minims of ammonia, and five minims of a sixty-grain solution of bromide of potassium. In this solution the plate remains for a very considerable time before any appearance of development is discernible, probably three or four minutes, after which the image appears very gradually and with beautiful clearness. If there should be any reluctance on the part of the lines in the darker portions of the engraving to come out, we added more ammonia, and as soon as the details in such portions were strongly impressed the quantity of bromide was doubled. These details were adhered to with the exception that the gallic acid solution was reduced to two grains to the ounce, and the results were such as to fully satisfy us in most cases. With some plates, however, it was found necessary to force the quantity of ammonia so greatly that, though no signs of surface fog were visible before fixing, green fog was apparent to an alarming extent after that operation had been performed. The density even with the feeblest plates was all that was required for ordinary line work; but with those which easily run to density under ordinary circumstances absolute opacity was readily obtainable, but the operation was a slow one, lasting at least twenty minutes.

With a view of avoiding green fog, and also in the hope of hastening the acquisition of strength, we resolved to try the

substitution of potassium carbonate for the ammonia, since, as is well known, the carbonates do not produce green fog, while by increasing the strength of the solution density is promoted, and, moreover, they can be employed without bromide, and consequently the development is shortened. The results more than bore out our anticipations. Not only was the time of development reduced to one-third, but a still greater degree of density was most easily attained, and the finished negatives were entirely free from green fog.

The following developer we found to answer with *all* kinds of plates, except such as possess a tendency to "frill," and we are sorry to say that such a tendency developed itself in two brands of plates we had not hitherto suspected, and which, with the potash developer, proved perfectly incurable:—

Potassium carbonate	360 grains.
Sodium sulphite	360 "
Water	6 ounces.

To each ounce of developer two drachms of this solution, together with thirty or forty minims of the ordinary ten per cent. solution of pyro (and sulphite), were added. The mode of development we found to answer best was to soak the plate first of all in the gallic acid solution for thirty seconds, and then to transfer it direct to the developer, where in another half minute or so the image commences to appear. Watch carefully, and when the details in the darkest parts of the engraving acquire tolerable strength, add five minims of a sixty-grain bromide solution and go on until sufficient density is acquired. Should matters hang fire at all, a few drops of the ordinary dilute ammonia solution may be added to freshen up the developer, but this will rarely be needed if the exposure has been correct.

On the latter point a word may be said. Though the use of gallic acid does not necessarily lengthen the exposure required, we find it better to give more than is *absolutely* necessary. Thus, if five seconds be sufficient to produce a perfect image under ordinary circumstances, give ten, or even fifteen. The result will be quicker development, less necessity for forcing, and hence less chance of fog, stain, or filling up of the lines. Six times the normal exposure has not produced any signs of the plate being over done; indeed, it seems next to impossible to produce such a result when the gallic acid is employed in this manner.

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DISTEMPER BACKGROUNDS.

In a previous article we gave practical details for producing plain backgrounds in flatted oil colour. We shall here describe the method of preparing them in distemper. Ordinary distemper backgrounds, it may be explained, are easier of preparation by the novice than are those in oil colour, while they answer the purpose equally as well. They have, however, the disadvantage of not being so durable, though this, to some extent, is compensated for by the ease with which they can be recoated in case of injury.

Premising that the background is to be a new one, and that the work has to be commenced *ab initio*, the first thing to do is to strain some canvas, or sheeting, on to a frame or wall as described a fortnight ago for oil colour, the same kind of fabric being employed. Next it is coated with size, as then directed, when it will be ready for the distemper.

The distemper is prepared as follows. Dry colours, as supplied by the oilmen, are mixed with warm water to about the consistence of thick cream. The colours selected must, of course, depend upon the tint desired. A grey is made by mixing

common whiting with lampblack—an addition of Venetian red will give the grey a warmer and more agreeable tone. Burnt umber and whiting, with or without the addition of black, also makes a pleasing colour for a background. But the particular colour adopted is, in all cases, very much a matter of taste on the part of the operator. When the colours, whatever they may be, are intimately mixed and rendered free from lumps, a quantity of common size—procurable at the oilshops—is added, and the whole well stirred together. It is scarcely necessary to say that the size must be melted before it is added. The object of using hot water in mixing the colours is to prevent the size from gelatinising on its addition.

With regard to the quantity of size and the amount of colour to be used, no definite proportions can be given, as all will depend upon the pigment selected, some being much heavier, in proportion to their colouring power, than others; also upon the fact that different samples of size vary much in their strength. One or two experiments will determine this point. There is, however, great latitude in the matter. The effect of too little size is that the colour will rub off when dry; and of too much, that the work will dry with a gloss. Some criterion as to the proper proportion is this: when the mixture is cold it should form a thin tremulous jelly. After the right proportion of size has been added and thoroughly incorporated, the whole must be strained through coarse muslin or fine canvas. It is then allowed to become perfectly cold—prepared one day it will be ready for use the next.

The great point in connection with the use of distemper colour is to employ it cold and in a jellied condition, because if it be used warm it is very difficult to obtain an even surface free from brush markings. Sometimes a small quantity of treacle is added to the mixture. The object of this is to prevent the coating, when dry, from becoming brittle, and eventually peeling off or cracking should the background require to be rolled up. It also somewhat retards the colour from drying, which is often an advantage when it is applied during hot weather. If this addition is made the old-fashioned “green treacle,” or molasses, should be employed, and not what is known as golden syrup, which is quite a different thing. When the distemper mixture is firmly set it is well stirred up with a stick, so as in some measure to break up the jelly. It is then ready for use.

The colour is applied to the canvas with a common white-wash brush. It is laid on somewhat thickly—the small lumps of jellied colour being broken up with the brush as it is applied. It is not necessary that the distemper be laid on so evenly as it is in the case with oil colour, for so long as no actual lumps remain it will suffice. A distemper background may look exceedingly unpromising when it is partially dry, but yet prove perfectly even when quite so. The chief thing with distemper—as with flatted oil—is to avoid one portion of the work becoming dry, or partially dry, before the next is covered. Unless this be accomplished the overlapping brush marks will invariably be apparent in the finished background.

One point in connection with the avoidance of brush markings is that the ground should be rendered impervious in the first instance, otherwise, when the colour is applied, much of the moisture it contains will be immediately absorbed by the fabric itself, thus leaving the surface of the colour in a semi-dry condition.

In the foregoing directions we have assumed that a new background was being dealt with, but it will often happen that an old one has to be treated. In this case there is no material

difference in the *modus operandi*. The old background must be sized the same as a new one in order to render it non-absorbent. If it has already received many coatings of distemper there will, necessarily, be a considerable accumulation of colour on the fabric. This excessive thickness of pigment will always have a tendency to crack in very hot weather, arising from the contraction of the old gelatine present. This tendency may, to a great extent, be counteracted by introducing some substance which will prevent the colour from becoming abnormally dry. Treacle will fulfil this condition; therefore, to the size used for the sizing prior to recoating, a small quantity should be added. The mixture of size and treacle being absorbed by the accumulated pigment will confer upon the film a certain degree of flexibility as well as elasticity. Care must, of course, be taken that an excess of treacle is not employed, which would prevent the colour from drying at all.

A PRELIMINARY account, by Dr. Arthur Schuster, of the photographic results achieved by his division of the observing party during the eclipse of last August, has been read before the Royal Society, and contains matter as interesting to the photographer as it is valuable to the astronomer. Unfortunately the weather, as has already been said, was by no means favourable, so that all the original plans for attacking the eclipse phenomena had to be modified at the last moment. The length of the exposures, for instance, had all been arranged beforehand; but the weather was so uncertain that they had to be instantaneously estimated at the exact moment of “uncapping” in each case. One consequence is a little uncertainty as to the actual duration of the exposure, Dr. Schuster’s belief being that they were from fifteen to twenty seconds. The definition he obtained in the negatives was not entirely satisfactory; and after a most careful examination of the different adjustments he came to the conclusion that it did not lie in the photographic process, but “if we are to obtain better photographs of the corona, we can only hope to do so by means of a better mechanical arrangement for moving the camera.” We learn from this preliminary account that a paper negative was attempted, but that it showed only very little detail, although the glass negatives gave definition equal to the Egyptian eclipse pictures. He had three cameras at work, one for direct photographs and the others for spectroscopic observations. One of the sets of plates had been specially prepared by Captain Abney to be sensitive to green radiations.

SOME time ago we brought under our readers’ notice a description of Professor Langley’s bolometer, an instrument strongly sensitive to the invisible radiations of the infra-red even when of great feebleness; but at the same meeting that the above-mentioned paper was read, Mr. C. Vernon Boys described an instrument he had devised which was far more sensitive than even the marvellous bolometer. So sensitive is it to radiations of slight intensity that, even in an imperfect form, the “radio-micrometer,” as it was called, was capable of giving indications when subjected to the radiations emitted from a halfpenny when illuminated by a candle at a distance of eleven hundred and sixty-eight feet! The inventor stated that it could easily be shown that the instrument would be sensitive to a change of temperature of the one-hundred-thousandth of a degree of heat.

AN instructive experiment was shown before the Berlin Physical Society by Dr. Vogel, with the idea of disproving in an effective manner the exploded, but still popularly held, theory, that a mixture of blue and yellow lights gives a green colour. The experiment may be here detailed, as it has a most instructive bearing on certain notions about dark room windows, held even yet by some workers. Many photographers still believe that if one thickness of glass of a certain colour will not suffice to arrest the fogging tendency, a second sheet in front of the first is found to do it. They entirely disregard the fact that the eye alone is not for one moment to be trusted to gauge

the quality of any colour for photographic purposes, as a residuum of strongly actinic light may yet pass through a medium that appears of the purest orange or red, and that that residuum will pass, but slightly diminished, through a similar sheet. Dr. Vogel's experiment brings this fact home in a very conclusive manner. He filters the light, first, through a layer of a solution of "acid yellow" (picric acid, probably), the issuing beam being then of a bright yellow. When he allowed this light to pass through a phial containing an ammoniacal solution of copper (a vivid blue in colour) a bright green appearance was produced; but when a phial of similar blue appearance, but different chemical nature (aniline blue), was placed in the path of the yellow rays, the difference was most striking; instead of green a fiery red colour was seen.

A KNOWLEDGE of the constitution of colour is a necessity for all photographers who look upon photography from its scientific side, and the principles elucidated by the above experiment might be indicated in many other ways. There was recently described in *Nature* a very neat way of mixing colours by superposition by means of the optical lantern, one light and lantern only being required. The ordinary objective was replaced by a frame containing a lens cut in two, the halves being made to slide to and fro. Each half acted as a lens, so that when placed together the image of the light, as seen through a small circular diaphragm, was projected as one disc on the screen, but by sliding the lenses in contrary directions, discs overlapping one another to any extent might be obtained. To mix colours all that was necessary was to place coloured films, or troughs of coloured liquids, behind each half of the lens, and upon the screen they would be respectively separate and mixed to any required extent. We commend this simple plan to the notice of photographic lantern exhibitors.

Just at present the possibilities of the great Lick telescope are greatly occupying the minds of scientific observers in America, and, near the scene of its operations, an acrimonious newspaper war is being fought upon the question. Mr. Proctor has been pointing out that, hitherto, big telescopes have, almost universally, been a practical failure, so far, that is to say, as regards what might be reasonably expected from them; hence he would appear to infer that the new instrument is also likely to be classed among the useless tubes, and he has raised rather a storm at San Francisco. After all, there are no grounds for asserting that because one big telescope fails another will also, so that we still hope to hear of some marvellous photographs being obtained by this monster instrument.

Our readers may remember that Mr. Howard Grubb had, for use with the telescope, designed an improvement upon the ordinary observing chair, which may be more properly termed a ladder, but that his design was stated to be too late. We learn, however, from Professor Holden's paper in the *Atlantic Monthly*, that the plan is to be adopted. An observing chair for this mighty instrument would need to be of any height from five to thirty-five feet, but Mr. Grubb, instead of allowing the observer to be put to the trouble of what would practically be like ascending the stairs of a lofty house each time he went to observe, uses a chair of ordinary dimensions, and enables the observer to reach the eye end of the instrument by raising or lowering the whole floor of the dome at once. This moving floor is to cost fourteen thousand two hundred and fifty dollars—nearly three thousand pounds.

THE OXYHYDROGEN ZIRCONIA LIGHT.

ONE or two readers of the JOURNAL may possibly remember that a year or more ago I was very anxious to avail myself of, and to obtain for the use of others, the alleged advantages of the Zirconia light. According to what had been written about it, we were in this way not only to avoid pitting of the lime, but the rarer earth was also considerably the "most luminous." I am sorry to have to report only a failure so far, and that of a kind which practically puts an end to my own expectations of any good result. It is with a last hope of eliciting any better results from others, that I now briefly state my experience.

During the last twelve months I have seen several statements in various papers that Zirconia was "frequently" used instead of lime; but every effort on my part to find one such operator, who was actually using this earth, has proved fruitless. Equally fruitless have been my endeavours to procure one of M. Tessie du Motay's Zirconia pencils, such as were sold years ago, and exhibited once at the Royal Institution by Mr. Ladd. The successors in business of that gentleman are unable to assist me, and I cannot get such a thing anywhere. If any reader possesses, and can lend me, one of these pencils for a brief trial, I shall feel particularly obliged to him.

I have myself tested experimentally three different samples of Zirconia; and as my sole hope of ultimate success lies in the fact that each one of the three behaved in a different and distinct manner, and therefore that the removal of the presumed impurities might improve the results more than I expect, I describe them.

1. The first was a sample considered "pure" by Messrs. Hopkin & Williams, kindly compressed for me, and for his own trial, by Mr. Chadwick; but this sample was so impure as to be useless after about a quarter of an hour. It coloured the flame intensely yellow, and the prism at once showed this to be due to a considerable portion of soda. Otherwise, the incandescence itself was pretty white (as distinct from what is mentioned presently), and the soda might in time probably have been volatilised out of the cylinders. A far worse fault was the large quantity of silica in the sample, which quickly fused into a thick yellow glaze, in which large cracks immediately appeared. After that the light was far too poor for any purpose, and was not good at the best. I may say that all the samples were tried on the flat ends of cylinders about three-eighths of an inch in diameter, giving a bright disc of that size.

2. The next sample or samples were prepared (largely by blowpipe process) by a gentleman who does not wish his name mentioned at present, but who has taken great interest in this matter. There was not much soda in his samples, and it rapidly disappeared under the jet. The sample also stood the jet much longer and better. But considerable silica (the great difficulty in preparation) remained, and through dark glasses could be seen to seethe and fuse under the heat, rising into waves and ridges. After this the light diminished very greatly, and great cracks appeared in the face of the cylinder. There began now, moreover, to appear a peculiar reddish glow about the light, utterly different from the sodium flame, and quite pronounced; and the peculiar properties of Zirconia were now very conspicuous, especially as regards its extraordinary non-conducting character. With a powerful jet playing on this small surface, the incandescent portion only extended about one-tenth of an inch back from the face, and was bounded by a nearly sharp line. Moreover, the bright surface barely extended to the edge of the small disc, and the brightest portion in the centre was only three-sixteenths of an inch in diameter. A further curious phenomenon was, that the cylinder rapidly began to crack all round at the boundary of the bright incandescent portion, and this crack gradually penetrated the cylinder till the slice thus separated fell away from the face. This seems to show a sudden and unequal shrinkage, which I fear will be a great difficulty in using Zirconia. This light, at its best, was considerably inferior to that from an ordinary lime with the same jet.

3. The third sample was obtained by Mr. H. G. Madan, of Eton College, from Herr Schuchardt, of Görlitz, and was stated to be prepared "especially" for the oxyhydrogen light. It is sold at the rate of eighteen shillings for ten grammes, of which about half is needed for one small cylinder. This powder shrank enormously when heated, showing that the oxide was very largely hydrated, and that the water was driven off when the cylinder was ignited. Otherwise the sample appeared the purest of the three, was very dry after ignition, and the cylinder was much more friable or fragile after compression. (The preceding samples were both as hard as marble after delivery from the die.) On heating in the jet, however, the plug seemed to bake quite hard. It behaved quite differently from either of the others, being evidently far more free from silica. After half an hour there was nothing on the face beyond a very slight and even glaze—no mass of glazed silica, as in the others, and the surface remained flat and sound. But the red glow was far more marked than in either of the two former, and I am most anxious to discover whether it is characteristic of pure Zirconia itself, or is due to some impurity which might be

eliminated. Also the circular crack round the cylinder was formed far more rapidly than on the others, and the layer on the face dropped off after no more than half an hour. I much regret that this separated layer was not inserted in a loop of platinum wire, and heated by itself, as such a thin disc might possibly not crack again.

But the light was, again, far inferior to that of a lime. Mr. Madan tested the plug again, after being crushed and remade up, at Eton, and compared the lights photometrically in the usual way. With the same jet, the light from the end of the Zirconia cylinder was to that of an "Excelsior" quarry lime in the proportion of 1 : 2.88. This is a very startling difference, and the opinion of all who have had to do with these experiments, is very decidedly to the effect that the vaunted Zirconia light is what Americans call "a fraud."

Some qualifications may, however, be made. The surface made incandescent upon a lime cylinder is obviously much larger than that of a disc three-eighths of an inch in diameter; in fact, probably the proportion is not very different from that of the illumination as given above—hence the *specific* brilliancy of surface may be about the same, or a little more. It may be asked, Why, then, not use more surface of Zirconia? As regards any single jet, the answer is, that owing to the extraordinary non-conduction of heat before alluded to, such larger surface *cannot be illuminated*. The gentleman whose name is not mentioned is about to try the experiment, however, of using upon a larger disc the flame from two or three nozzles, and I await the result with interest. This will, however, even if successful, lose one of the best properties of the Zirconia light. The *small* bright disc gives a parallel or other beam from the lantern, for optical work, about as "sharp" as from the electric arc. So great is this advantage for some purposes, that if I could only obtain cylinders that would "stand," free from silica, and which did not crack off, I would be thankful for them even with the less light: with the microscope, for instance, the light condensed on a *slide* for a one-eighth immersion lens would be nearly as great, and the definition better. It is chiefly on this account that I ask for any information any one can afford on the subject of Zirconia.

It may naturally be asked, How does it happen that our experience, as here narrated, differs so radically from that stated by others as regards the "superiority" of this light? My own opinion is, that the American and Continental experimenters simply have not known *what a good limelight is*. Professor Linnemann's new jet, which has been recently described, has the very useful property of condensing the heat into a very small point—very valuable for spectrum purposes; but otherwise it is only a blow-through, and when he remarks on the "unsteadiness" of the light from other forms, he shows at once that he has not worked with the right thing. Several Continental jets have come into my hands at different times, not one of which would give a good light in the opinion of any ordinary English lecturer, and the Americans, also, are fond of jets with extremely small apertures, judging from some I have seen. It is noticeable that with an ordinary and fairly good *blow-through* jet the Zirconia compares with the lime much more favourably; it seems to give a much greater proportion of light when so heated than the lime does, as if it became sooner "saturated"—if the expression may be employed. That is the only explanation I can suggest.

However, I am most anxious still for *any* further information any one can give. I am particularly desirous to know, as to details, (1), Whether the peculiar *red glow* is characteristic of Zirconia itself, or of some impurity. (2), Whether there is any source whence it can be procured commercially, thoroughly *dehydrated* and *freed from silica*. I know Dr. Draper's process, but have not time or means to think of preparing a sample myself, nor am I anything of a chemist. And, (3), whether any one has had experience of a sample which does not crack off in the way described, or found success in using a *thin slice* in the way suggested, but which we have not tried as yet.

LEWIS WRIGHT.

P.S.—*Arc Light*.—I should be very much obliged if Mr. McDougald would state particulars of the arc light used at Dundee, as described by him, namely, the lamp employed and the current used, stated in volts and ampères. His electrical friends would give him these details, and which others would thank him as well as myself. At the same time I am not so sure as he seems to be that the oxyhydrogen light would have utterly failed on a thirty-foot disc, especially if there

really is any superiority in it when bottles are used. I fancy the old Polytechnic screen was not much, if any, short of that. I know no thirty-foot screen in London now, or one or two of us might rather like to have a shot at it, just out of curiosity, to see what *could* be done. I am not sure but a one-tenth of an inch nozzle and ten feet of oxygen per hour might do decent work. My interest in that point is, however, purely speculative. I fully agree in the superiority for all practical purposes of the arc for large screens, and have present practical reasons for asking for his details. L. W.

A SHORT HISTORY OF PHOTOGRAPHY IN COLOURS.

THERE is probably only one thing which it is safe to predict about the problem of obtaining permanent photographs which shall represent objects in their natural colours, and that is that the discovery, if it is ever made, will not be the result of an accident. The question must be studied and the conditions mastered before the attempt can be made with even the least chance of success. The following account is given with the hope of drawing attention to the progress which has already been made, whence it will be seen that, with regard to naturally coloured pictures, we are now precisely in the position occupied by Davy and Wedgwood with respect to ordinary photographs at the commencement of the present century. Davy could obtain copies of objects upon paper coated with silver chloride (1802), but he could not fix them. Similarly it has been possible for many years, certainly since 1848, to obtain naturally coloured photographs; but no certain means have yet been discovered by which they can be rendered permanent. The colours fade away when the pictures are exposed to light, or when they are treated with the ordinary "fixing agents" of the photographer. When will the Niepce, the Talbot, or the Daguerre arise who will do for colours what these "fathers of photography" did for pictures in black and white?

Seebeck's Experiment, 1810.—Early in the present century an observation was made which favours the views of those who believe in the possibility of reproducing, photographically, the natural colours of bodies. In 1810 Dr. Seebeck, of Jena, was engaged in repeating certain experiments, first made by Ritter in 1801, upon the existence of the ultra-violet rays. For this purpose Seebeck passed a beam of white light through a prism, and received the spectrum, or band of coloured light so produced, upon a sensitive surface of chloride of silver. Upon this substance he was afterwards surprised to see distinct traces of colour. Describing the experiment in the *Farbenlehre* of Goethe, Seebeck writes:—"When a spectrum produced by a properly constructed prism is thrown upon moist chloride of silver paper, if the printing be continued for from fifteen to twenty minutes, whilst a constant position for the spectrum is maintained by any means, I observe the following:—In the violet light the chloride becomes a reddish brown (sometimes more violet, sometimes more blue), and this coloration extends well beyond the limit of the violet. In the blue part of the spectrum the chloride takes a clear blue tint, which fades away, becoming lighter in the green. In the yellow I usually found the chloride unaltered; sometimes, however, it had a light yellow tint. In the red, and beyond the red, it took a rose or lilac tint. This image of the spectrum shows beyond the red, and beyond the violet, a region more or less light and uncoloured."

Observations of Herschel, Daguerre, and Talbot.—In 1830 Sir John Herschel also noticed the colours produced upon sensitive surfaces by the action of coloured light. He found that "the spectrum impressed upon a paper spread with the chloride of silver is often beautifully tinted, giving, when the sunshine has been favourable, a range of colours very nearly corresponding with the natural hues of the prismatic spectrum. The mean red ray leaves a red impression, which passes into green over the space occupied by the yellow rays. Beyond this a leaden blue is discovered."

Daguerre noticed that a red house gave a reddish image on his iodised silver plates in the camera, and at an equally early date Fox Talbot observed that the red portions of a coloured print were copied of a red colour on paper prepared with chloride of silver.

Hunt obtains Photographs Coloured by Light.—Between 1840 and 1843 Robert Hunt tried many experiments on the production of coloured images by light. By dipping paper first into nitrate of

silver, and then into sodium fluoride, he obtained a thin coating of silver fluoride. When this paper was exposed to the spectrum "the action commenced at the centre of the yellow ray, and rapidly proceeded upwards, arriving at its maximum in the blue ray. To the end of the indigo the action was pretty uniform; it then appeared to be very suddenly checked, and a brown tint was produced under the violet rays, all action ceasing a few lines beyond the luminous spectrum. The colours of this spectrum are not a little remarkable. I have now before me a spectrum impressed two months since, and the colours are still beautifully clear and distinct. The paper is slightly browned by diffused light, upon which appears the following order of colours:—A yellow line distinctly marks the space occupied by the yellow ray, and a green band the space of the green; through the blue and indigo region the colour is an intense blue, and over the violet a ruddy brown." Although this description is not very clear, it seems to point to two modes of treatment of the sensitised paper. The colours were only obtained in the second case, when the paper had been insulated or exposed to light for a short time before the spectrum was allowed to fall upon it.

Other results obtained by Hunt are recorded as follows* :—"A paper prepared by washing with barium chloride and nitrate of silver, allowed to darken whilst wet to a chocolate colour, was placed under a frame containing a red, a yellow, a green, and a blue glass. After a week's exposure to diffused light it became red under the red glass, a dirty yellow under the yellow glass, a dark green under the green, and a light olive under the blue."

In another experiment, tried in 1843, with paper prepared with bromide of silver and gallic acid, "the camera embraced a picture of a clear blue sky, stucco-fronted houses, and a green field. The paper was unavoidably exposed for a longer period than was intended—about fifteen minutes. A very beautiful picture was impressed, which, when held between the eye and the light, exhibited a curious order of colours. The sky was of a crinison hue, the houses of a slaty blue, and the green fields of a brick red tint." Hunt adds, "Surely these results appear to encourage the hope that we may eventually arrive at a process by which external nature may be made to impress its images on prepared surfaces in all the beauty of their native coloration."

W. JEROME HARRISON, F.G.S.

(To be continued.)

ON THINGS IN GENERAL.

MR. ARTHUR DEBENHAM has raised a nice point (or has had it raised for him by a client) in an inquiry as to whom a negative belonged to. It is, however, not to be settled in the jejune manner of one correspondent who replies to his letter. It would be a very simple matter to clean a negative with a hammer if a doubt as to its ownership were raised; but in the event of the sitter "going to law," and the ownership being decided to be vested in the other side, the owner of the hammer would be in an awkward position. As to the moral aspect of the question, there can be little possibility of conflict of opinion; but its legal bearings might present much difficulty. To the best of my recollection, the question has been raised on more occasions than one in years gone by—twenty or thirty years ago—but I do not remember a case having been brought into court. In those days there might be some excuse for the sitters claiming the "plate," when the artistic qualities of most photographs were at such a very low ebb that there was some justification for the analogy then suggested—"twenty-five address cards, including plate, for half a crown." But at the present time when men of great artistic power produce photographic portraits, and much skilled artistic labour, in the shape of retouching, is bestowed upon a negative, it would be the height of injustice to claim the negative from the photographer. Still, it is, after all, a point of law upon which a layman could not give any opinion of value. My view as to the result of an appeal to law is that all would depend upon the skill of the lawyers employed to get up the case. If there were a readier means of obtaining copyright, say, for example, as suggested by "Artist" in a recent number of this JOURNAL, much of the difficulties of such matters would disappear, though it is obvious that to make every picture copyright

* *Researches on Light*, 1844, page 277.

that a photographer takes would be entirely out of the question. A rather amusing lawsuit connected with this branch of the question was tried the other day. A very Great Personage was standing at the front door of a gentleman's house, and the house and the Great Personage were photographed. The owner of the house asked for and obtained an injunction to restrain the photograph being published by some one into whose hands it had got. I should very much like to see a copy of the "little bill" that will have to be paid!

The hanging at the last exhibition of the Parent Society seems to have excited an amount of acrimony and discussion greatly in excess of anything of the sort I remember. The post of "hanger" is a most unfortunate one to be thrust into, for, as one of the contributors to the recent controversy says, it is impossible for him to please every one. I consider it absolutely impossible for any one to know the real difficulties of the task who has not had actual experience in the matter, and unless he is an enthusiast no one will ever care to repeat such an experience. I was quite recently connected with an exhibition of paintings in which an irascible gentleman, who lent some eight or nine pictures of great value, absolutely, emphatically, and rudely declined to allow his pictures to remain for an extension of time that had been arranged for, simply and solely because of an insult to one of his pictures; it was couched in a low key of colour, and the exigencies of space had necessitated a rather brilliant painting, received at the last moment, being placed in immediate juxtaposition with this particular one of his paintings! The point is just such a one as was referred to by Mr. Wollaston at the meeting of the Photographic Society of Great Britain.

I was amused by Mr. Pringle's account of his visit to Mr. Valentine's immense establishment, which is evidently a place once seen to be remembered, and Mr. Pringle evidently made the best use of his eyes while going over the place. Referring to his remark that he found at least one man of like opinion as himself as to the best colour of a dark room—said colour being red—I may say that I can give another instance. Some half dozen years ago I remember being in the dark room of a well-known professional whose dark room walls were discoloured with a bright red colour.

There was a most instructive discussion at the last reported meeting of the lantern section of the Manchester Photographic Society in which the question of bottles *versus* bags was well weighed and considered. There can be no doubt that retort-made oxygen is cheaper than the bottled article, though the difference is less than appears at first sight, seeing that most calculations leave out the item of cost of skilled labour when the former is discussed. But the convenience of compressed oxygen is so very great, that it is often worth the extra cost. With regard to the pressure regulator to ensure the issuing gas always leaving at the same pressure, I would like to remind the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY that Mr. Lewis Wright, in that most valuable work of his—*Light*—describes a regulator that may be purchased for a few shillings which acts in a manner equal to the most expensive, provided that the pressure does not fall below a certain previously arranged degree. In the case of bottles this, of course, would only occur when they were becoming almost exhausted. It appears to me that the great bugbear of most people in this matter is the difficulty of ascertaining the amount of gas present. There should not really be any practical difficulty, for a simple glass gauge might be attached by means of a screw which would enable the contents to be estimated to a nicety. A still simpler plan would be to weigh the cylinders at the beginning of an entertainment—a little calculation would easily show how much gas had been used up. Heavy as is a gas cylinder, the loss of an ounce would be easily noted, and a single foot of gas weighs not far from an ounce and a quarter.

The possibility of paper support for emulsion preventing halation still seems to have many believers; indeed, I do not remember any what might be termed authoritative statement, one way or the other, having been published, though I have come across instances where what is represented to be halation has been manifested on paper negatives. One is inclined to say "Why, practically, should not halation or something like it, be produced on paper?" Paper is almost, if not quite, as translucent, thickness for thickness, as a gelatine emulsion film, and granted that an image in the shape of a strongly illuminated spot be thrown upon a piece of paper I see no reason why

sufficient light should not be dispersed in a lateral direction to enable a developable effect to be produced. Can any one give a reply to this query, based upon practice? FREE LANCE.

PACKING AND HANGING PHOTOGRAPHS FOR EXHIBITION.

SINCE last year's exhibitions throughout the country a great deal has been said of the hanging and packing of the photographs sent, and possibly a little more on this inexhaustible subject might not be out of place, with the object of trying to find a better means of procedure than that we are accustomed to.

Papers recently written are full of pointed, valuable hints to exhibitors, and the recitals of exasperating fractures, notwithstanding fair precautions, are well worth further thought before the regulations for the coming season's exhibitions are drawn up.

The actual hanging of the pictures entails an amount of serious work on those members who have rashly allowed their names to be on the hanging committee. Hours lengthened into days in some cases are spent in the task. An eye for beauty! an eye for symmetry! for harmony, for effect, for honest judgment and impartiality! are these kept in view while selecting the committee? I believe they are, yet in nine cases out of ten, when the actual work has to be faced, these attributes have to be ruthlessly kept down. The pictures may be hung and rehung, striving after the best possible positions, but before much headway has been made the hanging becomes pretty much a question of fit, and to the tired workers possibly behind time and with the Secretary following up with numbered labels, forwarding the cataloguing, it requires a very glaring error in harmony to induce them to revise a portion of their work.

The pictures are not so easily coaxed into their right places, and the necessity at times of having to remove several before being able to readjust a delinquent is not pleasant. Such commands as "Let it alone or you'll have the whole lot down directly," become frequent, and the thought suggests itself, Is there no easier method than the present? The amount of manual labour should be reduced to its lowest possible limit, a means of building up the pictures and of readily transferring from one wall to another might be devised, and those who are responsible for the general harmony and effect would have more scope for displaying their artistic taste.

I commend to the notice of your readers the plan pursued by the owner of a choice collection of oil paintings lately on view in the Academy of Arts, Newcastle. No doubt it may be familiar and in vogue at many similar exhibitions of paintings, but it has not, so far as I am aware, been adopted for photographs. It may or may not be considered the right mode for such, but that it is, when uniformly carried out, no detriment to the artistic value of the exhibits is fully shown in a photograph taken of a portion of the collection alluded to, which disposes in a very practical fashion of many of the difficulties of packing, hanging, and repacking. For the convenience of carriage, and subsequently of hanging, each framed painting is screwed into a neat, closely fitting case. This effectually preserves the picture during transit from place to place. From these cases the pictures are not removed, the lid only being taken off, and it is here that the utility of the arrangement is seen, for in a remarkably rapid manner the paintings are hung by simply placing the first series right round the base of hanging space and by building the remainder upwards, one case thus acting as a shelf or support for the other. It can easily be understood how firmly and quickly these can be made secure. By this method it is a very simple matter to try the various possible positions of pictures; they can be shifted so readily and an effect pleasing to the eyes of the hangers obtained without a surplus of energetic work or tedious waiting.

From a view of the collection above alluded to, it was evident that all sizes of pictures were as readily adaptable to each other as by any other method of hanging, and as pleasingly diversified. It may be thought by some that the cases would mar the beauties of the exhibits, and attract the eye to the disadvantage of photographs, but in practice I think it would not be found so, as when all are placed merely the edges of the cases are visible, and these could be painted a dark, unobtrusive colour, and would act just sufficiently as a distinctive line between exhibits, and prove, in many instances, a setting to the framed photographs. If such a course as here advocated were to become general, if a rule were made that all exhibits were to be forwarded fitted closely into a case of an approved description to be used as described above, how much simplified would be the management of our exhibitions. The amount of space, for instance, could be fore-calculated to a nicety, and provision made in the shape of

temporary screens to supply extra hanging space if convenient, and when known to a certainty they would be required.

Another important result would be the lessening of breakage. I cannot see how, except by downright, almost wilful, carelessness, any picture could get damaged. There would be no unpacking in the ordinary sense of the term, for the photograph would remain in the case. The lid only would be unscrewed and fixed on behind, and ready when wanted at the close of the exhibition. It is often in getting the frame out of its packing box that fractures occur, and valuable exhibits either patched up to their disadvantage or put aside as irremediable. In many instances, too, the exhibition room is not available for unpacking, some other part of the building, or neighbourhood, is used, to the further risk of damage in transit of the unprotected frames. These and many other liabilities of fracture that need not be enumerated would be avoided.

The trouble, and often expense, of storage of empty cases would also be a thing of the past, as there would be no empty cases to store. An exhibitor would gain renewed confidence if the plan suggested were adopted, as not a few have sworn off exhibiting in consequence of annoying scratches and fractures. T. M. LAWS.

FIXING SILVER CHLORIDE PRINTS BY MEANS OF SOLUTION OF AMMONIA.

[A Communication to the Edinburgh Photographic Society.]

THE usual mode of fixing photographic prints by means of hyposulphite of soda there are two leading objections: the first is the thorough after washing required, necessitating the expenditure of much time and water to get rid of the hyposulphite of soda and silver; the second is the doubt that overshadows the process as to the permanency of the prints even after all this trouble. To eliminate this second objection, various oxidising agents have been proposed, such as the peroxide of hydrogen, chlorine, &c., to destroy the last traces of the hyposulphites; but these are, I believe, seldom employed. At any rate, the first objection is so formidable as to make it desirable to escape from it.

Several substitutes for the hyposulphite of soda as fixing agents have been advocated. The sulphocyanides were extensively used in 1867 by M. Civiale, and again, in 1874, by M. Caval; and in THE BRITISH JOURNAL OF PHOTOGRAPHY ALMANAC for this year, the use of sulphite of soda is advised and described by Captain Abney.

Although the solvent powers of solution of ammonia have been known since the infancy of chemistry, I am not aware of any serious attempt having been made to use it as a practicable means of fixing the paper prints. Mr. Hume has obligingly directed my attention to Professor Hunt's *Photography*, and I find in the edition of 1851 the author says, "The chloride of silver being soluble in solution of ammonia and some of its salts, they have been recommended for fixing photographs. The ammonia, however, attacks the oxide, which forms the darkened parts so rapidly that there is great risk of its destroying the picture, or, at least, of impairing it considerably. It matters not whether the liquid ammonia or its carbonate be used, but it must be a very diluted solution. The only photographs on which I have used it with any success are those prepared with phosphate of silver, and to these it imparts a red tinge, which is fatal to their use for transfers." In the edition of 1857, I understand, he adds the following remark, "Still ammonia affords a ready means of partially fixing a photograph, and thus preserving it until a more convenient period for giving it permanence."

These statements were not encouraging, and I fancy may have had much influence in staying further trials. As my experiments with ammonia fixing have, so far as yet tested, had very satisfactory results, I can only account for its non-employment to some prejudice, and to the very unsatisfactory appearance of prints treated by ammonia when these are not toned at all, or only moderately so, with chloride of gold. I find when the gold toning is pushed far enough—that is when the picture has, in a considerable degree, been converted from a silver into a gold one—that the appearance after fixing in ammonia, whether a weak or a strong solution be used, is in most cases pleasing.

There is no difficulty in removing the uncombined chloride of silver from the print—this seems to be very soon eliminated—but a more prolonged treatment with the ammonia is required to get rid of the organic compounds, or compound of silver, resulting from the presence originally of the two salts, chloride and nitrate of silver, and the two organic substances, paper and albumen. If left in to any considerable amount, this leads to ruddy orange stains, or feeble general tinting produced when the print is exposed to sunlight. When, however, a little only is retained in the print, that may assume a nice cream colour, very suitable for some subjects, and it remains for time to determine whether any objectionable after changes may arise from its presence.

I am myself so hopeful of the good behaviour of prints fixed by ammonia, that I have in the meantime laid hyposulphite aside, and may be able to report at some future date the effects of subjecting some of these to the evil influence of a damp cellar, or other adverse conditions.

I have experimented on the solubility of chloride of silver in ammonia—somewhat roughly, I admit—and have arrived at a much higher rate of solubility than given in the only quantitative statement I have met with. I find that two per cent. solution of ammonia dissolves more than four grains per ounce, or a weight of chloride of silver equal to fifty per cent. of the NH_3 present, and that seven per cent. ammonia dissolves about twenty grains per ounce, or equal to two-thirds of the NH_3 present. I may note, as a curious circumstance, that, although alkaline chlorides are solvents of Ag Cl , yet when we add salt, or sal-ammonia, to a solution of ammonia nearly saturated with Ag Cl , the latter is copiously thrown down.

Advantages.—The advantages that may be claimed for the ammonia over the hyposulphite method of fixing prints are:—(1), Shortness of the time consumed between the toning bath and the finishing of the print (I here show a specimen which from the time of removing it from the toning bath until laying it down on the mount occupied less than eight minutes); (2), Freedom of the print from any sulphur compounds, and consequent promise of permanency; (3), Great saving of water required for the washings; (4), Preservation of the fainter shadings, which become bleached to a great extent under treatment with the hyposulphite; (5), The cost may be less, if the ammonia and dissolved chloride of silver and other silver compounds be recovered by partial distillation and treatment with hydrochloric acid; (6), The paler shadings in the picture retain a warmer tint than in the hypo fixed prints. This, in many cases, will be thought by some an advantage, as in portraits and sunny landscapes.

Against the ammonia method of fixing it may be admitted:—(1), That a longer and more thorough treatment with the gold toning bath is advisable (Captain Abney, it appears, finds the same to be the case when sulphite of soda is the fixing agent); (2), That the pink or other tinted papers have the colour more or less destroyed; but if a white paper be used, any desirable tint can be given after fixing; (3), That greater care must be taken that the sensitive paper is not exposed to much adventitious light; any slight shade of colour it may acquire is not bleached out by the ammonia, as in the case of the hyposulphite fixing. For the same reason, the whites given by weak negatives will not be rendered so pure.

And now I may offer some remarks on the mode of using the ammonia. First, as to the strength; almost any strength may be used. On card No. 29 is given a print on a pink-tinted paper; this, after being thoroughly gold toned, was cut in two. The one half was fixed in ten per cent. ammonia, or the "solution of ammonia" of the British Pharmacopoeia, having a specific gravity of 0.959—a much better standard for photographers than any of the stronger solutions. The other half of the print was fixed in quarter per cent. solution, or fully forty times weaker, yet little difference can be seen in the results so far as the fixing is concerned, only the stronger solution has more thoroughly destroyed the pink stain that the paper originally had. Strip one, on card No. 19, shows an attempt to fix an untinted print by means of a solution so weak as one-sixteenth of a per cent. It is really fixed, so far as the chloride of silver is concerned, but a little of some organic compound of silver has been left, and the sunshine has changed this to a buff or deep cream colour.

As to the Time Required.—When only one bath is used, this seems to vary just inversely as the strength of the solution, and the downward limit seems to be five minutes for a two per cent. bath, ten minutes for one per cent., and so on, or time—ten minutes divided by the number expressing the percentage strength. This, when only one print, is put into a considerable quantity of liquid, and frequently agitated; but a longer time is necessary to secure freedom from cream tint of the whites, and can do no harm. However, I prefer using several baths, and this really shortens the time required, at least when we begin with a strong bath and finish with a weak one.

When the silver and much of the ammonia are to be recovered, it may be a good plan to use two pairs of baths, the first and second baths being the stronger, say one or two per cent., and the third and fourth baths filled with weak solution, say of half or quarter per cent. The first bath should, after treating a few prints, be put aside for distillation, the second taking its place while a fresh second is supplied. When the third bath is judged to become impure, the liquid is to be thrown away, and the fourth put in its place and a fresh fourth provided. The accumulated liquid from the first baths may be distilled into cold water, producing a weak solution for the second pair of baths, and when most of the ammonia has been distilled off, hydrochloric acid is to be added to the remaining liquid. To throw down the silver or otherwise, three or four baths of the same strength may be used, all being marched upwards to the position of the first, and the whole eventually subjected to the still in a way that will produce a solution of the proper strength. On this plan very little waste will occur. When not pressed for time, and the contents of all the baths are to be thrown away, I would recommend using a one per cent solution for the first bath, and not less than five minutes immersion, this to be followed by baths of quarter per cent. solution.

As to the Final Washing.—If the last bath be weak and not very impure, there seems to be no necessity for after washing at all. Nevertheless, I prefer giving the prints a final wash in water, and in the case of using pink-tinted paper it may be noted that a wash with weak acetic acid revives to some extent the colour. But it will be best to use white paper.

As to the Cost.—Since the price of ten per cent. solution of ammonia will be from 2d. to 3d. per pint, that of one per cent. may be stated at one farthing per pint.

Before concluding, I may mention that some of the ready-sensitised papers are not very suitable for the ammonia treatment, as they become pimplly or tacky, so that blotting-paper cannot well be used to dry the prints. Other papers are quite free from this objectionable feature. Should the revival of ammonia as a fixing agent meet with favour, much better results than I have shown will no doubt soon be produced. I especially look for improvement to spring from modifications of the toning bath.

ROBERT H. BOW, C.E., F.R.S.E.

WHERE TO GO WITH THE CAMERA.

BRIGHTON AND ITS NEIGHBOURHOOD.

It appears to me a curious fact that so few of our London brethren in the art really know anything of the vicinity of Brighton. If one hints at taking a holiday there we are instantly met with the query, "What is the use of going? There are no negatives to be got at Brighton." It is to these sceptics I should like to say a few words, and also do my best to give some hints for the benefit of those photographers who may by choice or chance visit our principal south coast watering-place.

In Brighton itself I must admit that the photographer who goes in for landscape views, old cottages, and rural bits generally, will certainly find a difficulty in obtaining subjects, as he will also do in most of our large towns. To the gentleman, however, who works with the detective camera, and whose chief aim is to secure studies of human nature, the beach and parade, especially during the excursion season, will afford him plenty of occupation. Some fine views of heavy seas are also to be had when there is a high tide with a strong south-westerly wind blowing.

Landscape views, as I have already pointed out, are not to be obtained in Brighton, but there are many in the vicinity if you know where to look for them, and a short railway journey will put you in the midst of some of the loveliest scenery in Sussex. To take a most popular place with artists, namely, Lindfield, the best way to get there is by train to Haywards Heath Station, where you are about a mile from the village. It is not a very interesting road, however, photographically, and, hence, a good plan is to travel by the omnibus, which meets most of the trains and which will put you down close to the church. In this locality you will find plenty of material for views, and a trip across the fields by an old ruined manor house at East Maskells, to Horstead Keynes, will repay you, and your stock of unused plates will rapidly diminish.

Excursions to the west of Brighton may also be made with advantage into the neighbourhoods of Bramber, Steyning, and Henfield, where numerous little bits—old thatched cottages, ivy-covered churches, water, &c.—may be found. To turn again eastwards into Glynde and its neighbourhood, on the line to Newhaven, will bring you across some rural and primitive scenes, while several quaint old cottages are also to be met with. To those who like long walks I should recommend a very invigorating one, which may be taken over the Downs, through the villages of Ovingdean, Rottingdean, Telscomb, Southease, and Piddinghoe, to Newhaven, where they can catch a return train to Brighton. I would strongly advise them, however, unless they are members of the Blue Ribbon Army, to take a supply of their favourite beverage with them, as in two of the villages above mentioned there is no accommodation whatever for the thirsty traveller. At one of them I had to call at four cottages before I could obtain even a glass of water. Another walk from Brighton is along the coast to Shoreham, taking the south side of the Basin running from Portslade to Southwick, where views of shipping, &c., may be obtained. The first part of the journey, however, is uninteresting, and it is well to get a lift either by omnibus or tram to Aldrington, where you can avail yourself of the ferry, and pass over to the south side of the harbour and proceed with your walk.

To enter into any detail as to the actual surroundings of the places I have mentioned would take too long a time, and therefore I have confined myself to pointing out some of the spots where views may be had with very little trouble. Many of them would repay a two or three days' visit, but putting up in a village when the elements may be against your working is not very enjoyable, and therefore I prefer to take as my centre a place with a little life in it, making daily excursions when the weather permits; and it is to those who hold similar views that I venture to suggest that they may go further and fare worse, photographically, than they will do in the neighbourhood of dear old, but much maligned, Brighton.

H. M. HASTINGS.

NATURE AND IMITATION IN ART.

On the occasion of prizes being distributed at the Croydon School of Art, Mr. Val Prinsep addressed the students. In the course of his remarks he said: "I would impress upon your mind the fact that all arts are really alike. They are to give pleasure to the world, and the artist has to impress what he feels in his heart, whether it be that he impresses that feeling and impresses that art in the language of literature or of painting, of music or of sculpture, or any of the other arts. We artists, with our usual presumption, have seized upon the name of artists, but we

are no more artists than the poet, the sculptor, or the musician. You here, in this School of Art, are beginning the language of the art of painting. You are doing good and excellent work of your kind, as good work as many other schools I have seen in Manchester and the big places I have visited; but though there is an enormous quantity of laborious and artistic work done in these schools, although you have shown considerable manipulative skill, let me point out to you that you are at the very beginning of art, that you are learning the A B C of the profession. You all know—most of us know to our cost—that when a person begins to learn an instrument, he has to spend much time in playing scales and exercises and other wearisome matters, and after having obtained certain facilities with his fingers, his friends may also, sometimes, know that he is unable to interpret any of the great works of the past masters, much less to compose himself. He becomes a mere playing machine, a kind of mechanical box, which may excite wonder, but cannot give any joy to the world. Now the aim and object of all arts is to give joy in this world, which would otherwise be dull indeed, and such a man's labours will indeed be thrown away if he can only show us manipulative skill without any art or thought. I do beg and pray of you to consider what it would be if you only became mere drawing mechanical machines. Now you will ask me how you can avoid doing so. In the first place I would beg of you to study drawing, for drawing is the grammar of the art. You must learn to draw, not only correctly, but with elegance, and to be able to express your feelings and thoughts in a manner that other people can appreciate, and which will give them joy. Now there are a great many books written nowadays which when a person reads he finds the style is bad, the sentences long and wearisome. The author has not found out the proper method of expressing himself. We, therefore, take that book and put it back on the shelf, or send it back to the circulating library, and say we will have no more of it. However great that author's thoughts may be, if he cannot express them so as to give us pleasure, of what use are they to us. But recollect this, that a picture, or a work of art, is always *en evidence* before us. It cannot be put on the shelf at all, and if it is to be appreciated and looked up to and be good in itself, it must have written on its face something that will give us pleasure on first sight and something that will repay us for looking at it again. For if you have it in a room you get to love it in all its parts, and if it is bad it is very bad indeed, not only for the picture, but for those that look at it. Now there are some amongst my own fraternity, and men of eminence, too, who think that the art training of the schools is not necessary. There are several instances of some of our very best artists who have not had that art training at all. I think this opinion is wrong. If they had an art training in their earlier years, if they had spent two or three years of their life in learning the elements of their profession, they would have begun earlier to do those masterpieces which we so much admire in their later time. As it is, you will find they were floundering about and learning their profession when they ought to have been masters of it before they began. I do not think myself that knowledge stamps out genius, or that professional skill necessarily does away with all invention and originality. There are some critics, too, who tell us artists that we are too fond of dwelling on the mechanical or technical parts of our profession, and that we therefore are not good judges of works of art. There again I naturally think they are wrong. A beautiful picture appeals to the artist, not only as it does to one who is not used to the art, but it says something to him a great deal beyond that. Always view with suspicion your own work as though it were the work of an enemy, and try and pick out the faults. Do not imitate, for those who imitate must always be behind. You will find in the course of time, when you gain experience, that there are many men who have attained considerable reputation and success, whose works are dexterous in the extreme, but whose works are really echoes of what has gone before. It is easy enough to account for their success. We all know that it is much simpler to understand a three volume novel than a great poem. One requires an effort, the other is nothing more than amusing, and has generally no backbone whatever. And it is so with art. Critics will always praise those things which are not difficult to understand, and it will be a long while before the original man can persuade them that what he does is really good. But the original man has no need to be additionally proud when he finds he has attained success. I have been impressing upon you the necessity of being original. There are dangers again that beset even the original man, for it may be that he will drift into eccentricity. Now that is a great danger to my mind, for eccentricity is not genius, though it is very often taken for it. The great geniuses are never eccentric. The other danger is the danger of vulgarity. It arises from pretentiousness. It comes from a desire to display yourself in your work, so that people looking at it are apt to exclaim, 'What a clever fellow that is!' Now a man who shows himself in his works to that extent is not a great artist, and never will be a great artist. The great artist shows a great mastery, no doubt, but there is always a feeling of reserve of force in everything he does. To do a work you must do it from yourself. You must not think of yourself when you are doing your work, but of the work you are doing. Earnestly and laboriously you may work at it, but do not let self intrude to any extent. Now there are characteristics in every age that mark at once the art of that age. In the last age we know there was a kind of pseudo-plasticism, when men wrote their epitaphs in Latin, like Dr. Johnson wrote Goldsmith's, and refused to allow English to enter into the precincts of Westminster Abbey,

and when that great painter, Sir Joshua Reynolds, was apt to clothe his ladies in dresses which he chose to think classical, but were nothing of the kind. That age has passed by, and the aim and object of everybody now is to be natural, nature being the great inspirer of the modern arts at the end of this century. Now nature, no doubt, is full of poetry. Nature is never vulgar, and nature is all around us. If you look at that great cartoon of Raphael's of the *Beautiful Gate*, you will see there a low, horrid, dirty, and depraved man. But he is not vulgar, for Raphael has stamped him with his genius, and placing him there as a contrast to his other beautiful figures, that low and dirty figure becomes the centre of the picture. That is the way to treat nature. You have it all around you. You have the sky above, with its clouds and its thunder, and its rain and sunshine, and its beautiful moonlight. You have the fields, greener than the greenest emerald, the trees with their infinite variety of tone and formation, and the hedges, full of an amount of design which would supply twenty such schools as this. You will find forms repeated in the branches of the brambles and thorns where every leaf varies from its neighbour just so much as to make up a true harmony among them. We have the little flowers twinkling in the grass in all varieties of colour and form. All these you ought to study and form your style upon. The gift of imitation is not art, otherwise the Chinese artist, who imitates even to deception, would be a greater artist than Raphael himself. But in all these works of nature you must put yourself and your own individuality out of sight as you do in your drawings and everything else you put your hand to. You must render it and not imitate it, and when you have done that, and when you have studied in the way I have described, you may then attain to that proficiency that you may understand the great language of the masters of the past, and a great picture of Titian or Raphael will give you pleasure."

THE STEREOSCOPIC PICTURE.

Why has this, the most satisfactory of the pictures made by photography, been so long neglected, if not altogether forgotten? There was a time when it was about the only style of photograph sold in the shops. There was a day when such houses as Appleton & Co. thought enough of it to operate an establishment where such pictures were made, and there was sale enough for such a house to have a department exclusively devoted to their handling. What reason can any one give for their having fallen out of the fashion? To me there is about the same reason that exists for the strange and senseless change in fashions. One year it is a hat with a narrow, flat brim, the next one with a broad brim, and a roll in it at that. It must have been some such good course of reasoning as this that obliterated the stereoscopic picture, and we who made them were all fools enough to follow the fashion in this, as in hats and pantaloons. There was a time when the amateur made this picture, no matter what other size he made; this was the only picture that was recognised by the exchange clubs. I do not wonder that those now in our ranks, who have joined since the advent of the dry plate, do not make this charming picture. Of it they know not. I do not wonder why it is that we, the old hands at the bellows, should have so thoroughly forgotten our early love. For one, I'm back. Now that I am, I wonder more than before why I have neglected this picture so long. The older hands remember well how many pretty bits we had to pass by because we could not give the needed time for exposure, fearing that our wet plate would crystallise. No such trouble now. We know, as well, how many lovely bits we had to pass because it was too long a run from our tent, or was but a single view; this does not trouble us now, for we can make our pictures as we move along. To those who know nothing of this style of photograph, I beg simply to say that it is suited to all those dark secluded beauty spots that are useless in the single picture; it gives the most minute detail and the best idea of distance, and is in many ways the most interesting picture the amateur can make. Who of the old ones seconds my motion to revive them? Who will join me? I have a presentiment that I will not stand alone in the coming photographic season.

—*Photographic Times.*

CHARLES WAGER HULL.

WHERE I WENT WITH THE CAMERA.

No. II.—ROTTERDAM.

I HAD BEEN in Rotterdam once, some years before, but on that occasion I was not impressed by its beauty. One reason might have been, that when going out to peregrinate over the place I got lost, and had considerable difficulty in finding my way back to the hotel, not being able to speak the language making the matter ten times worse. So that from time to time when I have heard that Rotterdam was an interesting and beautiful place, grave doubts have lingered in my mind regarding the grounds on which it could be so described. However, these doubts floated away like a mist as I drove from the quay to the hotel. Beautiful trees, handsome villas, and quaint, interesting streets—picture after picture crowded on my view as we sped along, leaving me surprised and pleased, and the nightmare Rotterdam of my previous visit was gone for ever. I put up at the Pays-Bas Hotel, a very comfortable house, and as the advertisements say, "attendance good, charges moderate." I arrived on a

Sunday morning. After breakfast, I started to try one of the light cigars of the country, as I sat down at the coffee-room window to have a look at the living and moving diorama passing and repassing in the street. For Sunday is a holiday, and the street is thronged with more pleasure-seekers than churchgoers, and the incessant hum and noise keeping time and tune to the constant "clang o' the wooden shoon," the clank, clank, of which played upon the ear continually.

The first thing that struck my fancy as being most grotesque and peculiar was the head-gear of the women, and as I looked at them one after another as they moved to and fro I had a quiet laugh all to myself, they looked so funny. Mostly all of them had muslin caps, beautiful in their cleanliness and purity of white—in some cases they had broad band strings thrown over the shoulders and hanging down the back, whilst immediately above each ear gold wired screws projected in front beginning about two and a half inches diameter at the start, and twisting out to a point at each side of the head; others wore fancy plates of polished metal and ornaments on the brow, fastened by metal bands round the head; and for variety, old ladies especially, had an ordinary poke bonnet surmounting all this finery. To the ignorant foreigner it was as good as a play.

Asking the method of their madness, I was informed that each of the varied styles of head-dress denoted the district or country to which the wearer belonged, so that they were really jewelled sign indicators of locality. When inquiring for information regarding the habits of the people, I noted many quaint and peculiar customs, for instance, I was told that in some localities, when a baby is born, a pin cushion is tied to the handle of the door of the house where the little stranger has arrived, this by way of announcing the fact, and the colour of the pin cushion designates whether it is a boy or a girl. Another custom, when any one is ill in a house, a small placard is fixed to the handle of the door, stating the condition of the patient, thus saving noise and ringing of the bell to inquire. Both of these habits seemed to me strange, but sensible.

I went to visit the Great Church, or Groote Kerk as it is called. Visitors are directed to this church as one of the sights of Rotterdam, but it seemed to me that, outside and inside, size was the only quality that it possessed, for a church more barren of architectural pretensions I never saw. Service going on, I had to wait half an hour before gaining admission. The first strange thing that met the visitor's gaze on entering was, all the men sitting with their hats on during service. Draughts might have had something to do with the origin of this fashion—for the church was cold and draughty—but to the stranger from other shores there seemed a lack of reverence in wearing this head-gear, considering the place and the service. Of course, they will think nothing of it: it's the custom of the country. The walls and side recesses of the church were filled with statues, monuments, and tablets, sacred to the memory of many heroes who had lived and died for their country's good. These names were manifold, and to me unpronounceable.

Next morning I started to photograph. To prevent the recurrence of losing myself I engaged a guide—David Abas by name, and a very worthy fellow. Should you wish a guide at any time when in Rotterdam, you will find him at the Pays-Bas Hotel, and I have no doubt but that he would be of great service to you. Being thoroughly well acquainted with the town, I got him to take me all over the place. The views that pleased and suited me I photographed, and those that were unlikely I left and went on.

From the crowds that gathered when I was putting up the camera previous to exposure—which was never more than three minutes at any time—one could at once see that photography out-of-doors was a rare thing in these parts, unless they did it professionally very early in the morning. My guide told me that he had never at any time seen a photographer in the street, and I can tell you it took him all his time to keep the crowd back. Oh, yes, we have crowds at home, but nothing like this. I did get the better of them sometimes. A good position could be had, it might be at the corner of a canal bridge where they could not possibly get in front, then the matter was easy; but the crowds gathered so quickly that the way across the bridge would be blocked in three or four minutes. A Punch's Opera could not have created a greater stir. It always seems to me that the uninitiated have got it into their heads that we really are some kind of show fraternity.

I was charmed with Rotterdam, and more especially the thickly populated parts of it, where the canals and water-ways hold their own. It was all so new and strange. The quaint old buildings, towering up four or five storeys high, all amudged, and bedaubed, and painted, by storm and sunshine and old Father Time; old houses with wood patch-work and projections, leaning over the canals as if weary of standing straight, or as if age was making them stoop a little, rendering them toppy and unsafe to the view; while below, the long, flat-bottomed boats moving leisurely up and down, or lying asleeply by the water side—these boats, in many cases, being the floating homes of the possessors. Many of them are painted green, and red, and yellow, broad patches of colour standing out from the dull muddy water, brightening the scene; whilst the foot passengers, the horses, and dogs, and carts, coming and going along the narrow sideways, all combining to form a striking picture. At such a time, and in such a scene, comes the oft-repeated exclamation, "Oh, that I could photograph the natural colours."

In the vicinity of the Groote Kerk are a lot of very narrow, intersecting streets, quite filled with old, curious, artistic studies, a wealth of work for

the painter, places where the aged buildings lean forward so much towards the top that the houses on one side seem to be having a chat with their neighbours over the way. All these houses are built on piles, which gives them this toppling tendency. The guide told me that they were perfectly safe, in fact, had stood in this precarious condition for many, many years. That was right enough I thought, but I for one would not like to live in them.

The more fashionable parts of the city are quite as interesting in their way, but more modern. The merchant princes' houses down by the parka are, in many cases, palatial in their magnificence. The park has within itself plenty of subjects and good pictures for many days' work. The Zoological Gardens is also a feature of considerable interest. Two or three weeks could be spent in and around Rotterdam without subjects palling upon the tourist photographer, and he would still leave plenty for the next comer.

Before leaving Rotterdam I thought that I would like to purchase some pyrogallie acid and ammonia and a couple of trays, so that when I had a little leisure I might develop a plate or two, as I had never before worked the lens I was then using, and I wanted to see how the negatives were going to turn out. So I got the guide to take me to one or two photographers' places, but they were using ferrous oxalate, and they had not trays to suit, and preferring the pyro and ammonia developer I asked the guide to take me to some photographic stores. For three hours I wandered round and round to opticians, apothecaries, and electrical apparatus warehouses, and not a living soul seemed to keep or know about photographic apparatus or photographic chemicals; they were all bought in Amsterdam was the usual refrain. I was shown all kinds of substances for pyrogallie acid, not the least strange amongst these being powdered French chalk. At last I managed to get the chemicals, and resolved to use kitchen plates for trays when the opportunity arrived. Moral, always carry a small supply of necessary things with you, they don't take up much room and are sure to come in handy.

MARK OUTE.

AUTOBIOGRAPHY OF C. E. MULCYON.

It may seem a very strange thing to some people that a humble individual like myself should venture before a reading public with an account of myself and a history, even though it be a short one, of the adventures that have befallen myself and some other members of my family. But biography and even autobiography have sometimes proved so beneficial to the public that I am led by my interest in the general welfare of my many relations to lay aside for the time being my usual modesty, and to enter into certain private details concerning my life that otherwise my retiring disposition would have constrained me to hold as secrets in my own bosom, or at least to withhold from the general ken as unimportant and trivial.

I am one of a family of four, being the third of that number born to my parents. My father was universally acknowledged to be a man of sterling worth, holding an important place in the Mint, and at certain times he dabbled in medicine. He was called Mr. Silver Nitrate, but his more intimate friends were in the habit of calling him AgNO₃. My father came of a good stock, and he was so pure of morals that he was sometimes jestingly called "Re-crystallised." Though his respectability was unimpeachable he could at times be very caustic, yet he never, if properly treated, displayed any acidity of temper. My mother, Mistress Bromide Potassium, was a lady of an amiable temperament approaching at times to drowsiness, yet in spite of her less enterprising nature her lineaments appear in all our family in excess of the more marked features of our father. My mother had a very small affection for alcoholic liquors, which was greatly to her credit; my father, though never addicted to intemperance, would melt considerably under the influence of a glass of hot spirits. A maiden aunt lived with the family and undoubtedly gave a tint to all of us, though she was of very small size in comparison with the rest of the family. She was a sister of my mother, and went by the name of Miss Io. Potassium, or more familiarly "K I."

Our nurse was a very important person in our little family. She bore us all in her warm soft arms from our very birth. We always called her "Jelly," which was our familiar abbreviation of Gelatine. In her earlier years she was, as all have heard, slim and threadlike, but just before we were born she had got a severe drenching in a pool of water, and thereafter she had swelled very much and become quite dropsical. The slightest heat caused her to dissolve, but she was at such times all the more willing and able to carry us, and prevent over-hasty collisions between my father and mother. Of our ancestors before our father and mother I have but little record; the family Bible, however, informs me that my grandfather was an amateur photographer living in the South of Scotland, whose chief pleasure and occupation, so far as we are concerned, was noting the actions, and keeping carefully the records, of the various members of the family.

It is now time for me to give some history of my brothers, and I will begin with a short sketch of my eldest brother's character and history. There was very little difference in our ages, for my eldest brother was born on the 18th of March, 1887, while I, the third of the family, first saw the light on the 22nd day of the same month. We were very like each other in personal appearance while we were in our infancy, the only

difference being that I took more after my father than my eldest brother. Jocular chemists used to say my brother had ten per cent. of extra likeness to my mother, while I had only about eight per cent. In other respects until we went out into the world there was a very strong family likeness between us. My brother was intended, as I was, for the Lantern profession, and his character was of so staid a nature, and his mind so very clear, that he soon distinguished himself in that line, though he might almost be called an indolent man. My eldest brother was brought up in a much cooler climate than I was, he never felt any heat greater than about 200° Fahr., and that only for a few minutes. He only got one thorough washing in his youth, and that was in a teapot into which my grandfather in a rage squeezed him through a horrid cylinder with silver wire gauze at one end. But he was always a very clean boy, so that the two hours' washing he got must have been a very effectual one. Grandfather, enraged still more at the backwardness and slowness of my poor brother, again put him in a very hot bath, quite boiling this time, and left him there for several minutes. But my brother must have been destined always to be slow, for he did not improve in this matter, but still retained his admirable lucidity of expression, and grandfather at last came to see his good points and kept him in a very honourable place, until my brother died a peaceful and natural death, having fulfilled his mission on this earth with credit to himself and satisfaction to all his kindred. This brother was called Andrew, or more shortly "A.," after his grandfather, as is the usual custom in the land of our birth.

The next brother, "B.," or Bob, was of larger build than his elder brother, but in education and appearance during their youth no difference could be discerned between the two. B. was just twice the bulk of A. It is true that Nurse Jelly through an accident got too near a fire with my poor mother Bromide in her arms, and my mother being at that time in an interesting state and very near giving birth to my brother, this mishap may have affected my brother in his after life. Anyhow, nurse and mother got boiled for a minute before grandfather reached the spot to save them. And, further, grandfather, thinking to make B. a livelier boy than A., boiled father and mother and nurse all together for five minutes. B.'s life was altogether a sad and an unfortunate one, for he caught *scarlet fever*, which grandfather first discovered when B. was sent out into the world on his own account. Grandfather being a man of rather a hasty temper, poor B. was at once buried in an urn containing a poison deadly to us.

Before I enter in detail into my own history, I will say a few words of the only member of our family yet born younger than myself. This, my younger brother, was baptized Duncan, and he was from the first very like my brother A. The scarlet fever contracted by poor B. caused my grandfather to give my mother a dose of acid shortly before D.'s birth, and I must own that Duncan has been an honour to our family; though not very brilliant in his talents, he had, like A., a thoroughly clear way of expressing himself, and he still lives, held in high respect for his qualities of sterling though not startling worth.

In bulk and in character I was very like my poor brother Bob, and up to a certain point my history is very much parallel to Bob's. There was a little more of my father in me than in Bob, but no one could ever detect any marked difference between us until the great event of my life. It happened in this wise. Both Bob and I had been treated to a little spirits, in order that we might not remain too long wet and so catch a chill after a long bath we had had; in fact, we had both been broken up and washed in a running stream for over two hours. Whether it was that our mother had suffered from alkalinity, or whether our grandfather's "blend" was adulterated, I cannot say; but certain it is that I caught scarlet fever just as Bob did, and had an attack equally severe. Grandfather was very angry that I, too, should have caught this disease, and would have killed and buried me beside Bob had it not suddenly occurred to him that there was in London, a village in the south of England, a great and famous doctor, called Henderson. Whether it was that this Doctor Henderson had been so very often in a fever himself as to be inoculated and impervious to such exanthematous diseases my aged parent did not know, but he knew that this doctor was really a famous and an able physician and not a quack, nor a vendor of secret pills and ointments, and he resolved to send me for a course of treatment by this great *savant*. So to Doctor Henderson I went. His treatment was very rough, no doubt, but there was such an amount of exhilarating change and healthy exercise in it that I did not so much object to the cure as some might conceive. The Doctor took me into a little room, where I saw an instrument of torture far more awful to look upon than anything I ever saw in my grandfather's house, or even at a dentist's. He put me into a very nice shiny silver apartment and began to turn a wheel quickly. I thought certainly my last hour was now come, for I rushed round the little room at a fearful rate. Still, all the time I was rushing about I felt that the fever was leaving me, and when the doctor had ceased his exertions I felt very thin and worn out, but quite clear in the mind. The doctor had with great thoughtfulness sent for my old nurse, Jelly; into her arms he once more put me, and in this state I went back refreshed, vigorous, and cured, to my dotting grandparent. He at once tested my strength of body and mind, and found me now so much improved, and so much more intelligent and quick, that he saw I should be thrown away, if indeed not too enterprising and hasty, for the lantern profession, and so he sent me out as a Landscape Photographer, a calling which I now follow to my own and my progenitor's satisfaction.

I can never sufficiently express my gratitude to Doctor Henderson, of London, for the wonderful cure he worked on me; and I can heartily recommend any of my friends or relations who have caught the awful disease, which so nearly destroyed me, to apply to the Doctor at once. Grandfather says he would at once, if he could command the means, buy from the Doctor his wonderful cure, but, failing this, he means to try to make for himself a "merry-go-round," which, if it will not cure scarlet fever or jaundice, will at least amuse the children with the smallest possible loss of fingers.

CHARLES E. MULCTON.

Department for Inexperienced Photographers.

THE ENAMELLING OF PRINTS.

WHILE there is a charm in a fine photograph taken on plain paper having a matt surface, there is also a peculiar charm in one of precisely the reverse character, that is, one in which the surface is not only smooth, but glassy, the grain of the paper being obliterated. When a small oval portrait is "*glacé*" it is a matter of extreme difficulty to distinguish between it and a similar portrait which has been vitrified or burnt in upon an enamel plaque.

But not alone is enamelling applicable to portraiture; landscapes also have a wonderful degree of lustre imparted to them when subjected to the *glacé* process.

In enamelling prints the first requisite is a plate of glass. This must possess a flat and well-polished surface and be quite free from scratches or other imperfections. The necessity for this will be apparent when we say that the most minute defect on the surface of the glass will be afterwards visible, more or less plainly, on the print when finished. Plate-glass should be preferred to any other. The plate having been obtained it must next be made quite clean, a final polish being given with a wash leather. A number of plates ought to be prepared at a time, and after being cleaned each in succession is stored away in a grooved plate box.

It is difficult to lay down any rule for determining the size of the plates, but it will conduce to ease in working if the dimensions be such as to permit of from six to twelve small pictures being laid down at a time. For half-plate size, four pictures will be a suitable number to place on one plate, two prints of whole-plate size sufficing. But this is a matter for the individual convenience of the operator, who, if he chooses, may employ plates no larger than the pictures.

Next, take a small quantity of powdered French chalk and tie it up in a piece of muslin, so as to form a ball the size of a walnut or an egg. This is applied to every portion of the surface of the plate with a fair amount of friction, beginning at the centre, and taking particular care that no portion is omitted. Inattention to this will cause the picture to adhere to the glass at a subsequent stage instead of stripping clean from off it. Having dusted off the superfluous French chalk, coat the plate with plain collodion. Some of the finest enamels we have seen were made with collodion consisting of four grains of pyroxyline and four drops of castor oil dissolved in half an ounce each of methylated alcohol and ether. But almost any good plain collodion will serve the purpose, provided a little castor oil is added to impart toughness. The plates thus collodionised, after being allowed to stand for half an hour, receive a coating of gelatine which has been prepared by pouring upon it a quantity of cold water just sufficient to cover it.

After standing for a few hours to permit of the water being absorbed, the vessel containing the swollen gelatine is placed in a larger one containing hot water. This immediately effects the liquefaction of the gelatine, which is then filtered through muslin into any convenient bottle having a wide mouth. This bottle should previously be made warm by immersion in hot water, or otherwise, to prevent any fracture which might occur through filtering warm gelatine into a cold bottle.

The gelatine thus prepared is applied both to the collodionised plate and also to the print. In the former case, a little is poured on the centre and spread by guiding it over the surface by a slip of stiff paper or a glass rod, after which the plate is left in a horizontal position until the gelatine sets, when it is reared up on end and allowed to become dry. As the plates when thus treated keep well, enough may be prepared at a time to serve for a whole season.

When required for use, lay one of them face up on a flat table, and having some warm gelatine (from the same stock bottle) poured out into a dish, immerse in it the prints, and then lift them out one by one, and lay them, face down, upon the glass, arranging them side by side, so as to economise space. When they have all been placed down, raise the glass, and looking through it examine each print carefully to see if no air bubbles intervene. Wherever one is seen, press the paper with a squeegee or the point of the finger and run it out to the margin of the print. We fre-

quently secure the perfect adhesion of the print by passing a wet sponge over the back.

The glass plate with the adhering prints is next reared up in a current of air to dry, and the drying should be of a thorough nature. According to the state of the atmosphere the drying will take from twelve to twenty-four hours. We need scarcely say that by having recourse to a warm (not hot) current of dry air this time may be very greatly reduced.

When dry, strip the pictures from off the glass, and it will be found that they have a surface rivalling that of the glass to which they were attached: this surface consists of collodion, to which they are firmly secured by the intermediate layer of gelatine.

The presence of the castor oil in the collodion so toughens the film as to prevent it from easily getting scratched or otherwise damaged.

As we have described it the process may seem a little troublesome, but it is not so in reality, as those who give it a trial will speedily discover. It may be simplified in some measure by transferring the plate, after being collodionised, to a dish of water, and then, having previously sponged the surface of the print with gelatine, laying it down upon the wet collodionised surface, and allowing it to dry as before; but the resulting print is not so brilliant as when finished by the method we have described.

RECENT PATENTS.

PATENTS COMPLETED.
IMPROVEMENTS IN CAMERAS.

No. 5450. WILLIAM MIDDLEMISS, Aliee-street, Bradford.—April 20, 1886. The first part of my invention has relation to the camera front, and its object is to enable the front to be readily fixed in position and to be folded into the camera bottom.

The camera front, to which the bellows is attached, is made to slide between the sides of a forked frame as usual. To the sides of this forked frame are attached with set screws two brass struts, and the ends of these two brass struts are pivoted to the frame which travels in the camera bottom. At the bottom ends of the sides of this forked frame two pins are fixed, and these pins are made to go into two hollow places at the front end of the frame in the camera bottom. When the pins are placed in these hollow places two brass turnbuttons or catches are made to turn over them to prevent their lifting out; thus it will be seen the forked frame may be swung backward and forward and fixed in position by means of the two struts.

When it is required to fold up the front, the bottom end of the forked frame is released, slid on the camera bottom to the back end, and the combination of forked frame, struts, and camera front, laid down in camera bottom with its face downwards.

The second part of my invention relates to the camera back, and its object is to enable the camera back to be readily moved from one end of the camera bottom to the other.

The camera back is pivoted between two brass plates; to these two brass plates are also pivoted the bottom ends of the two struts which keep the camera back in position. These two brass plates are made to slide against the sides of the camera bottom from one end to the other. To the sides of the camera bottom are fixed two brass plates having slots made down the centre of them, and behind these plates are made to slide two bolts or set screws.

By means of these two bolts the brass plates to which camera body and struts are pivoted may be fixed at any part of the camera bottom.

A NEW OR IMPROVED PROCESS FOR REPRODUCING PHOTOGRAPHS IN COPPER-PLATE, LITHOGRAPHIC, OR PRINTING PRESSES.

No. 5595. LORENTZ ALBERT GROTH, K.G.V., 30, Finsbury-pavement, London, E.C.—April 22, 1886.

THE object of this invention is to reproduce photographs in copperplate, lithographic, or printing presses in a better and cheaper manner than heretofore by means of the common photographic press.

In order to obtain such a result the photographs to be reproduced must be provided with a surface in relief, as with the ordinary smooth surface such reproduction is impossible.

For this purpose a specially prepared gypsum mass, as also a specially prepared pigment paper, is required, from the latter of which a negative is taken, and which can then be used as a medium for producing an irregular surface of crooked lines and figures from the half tones.

The gypsum mass is composed of one to six per cent. chalk and fifty per cent. water to each one hundred parts gypsum, the latter, together with the chalk, being finely powdered and well worked with the water to obtain an homogeneous mass, which is then pressed into plates of suitable size, having a polished surface when dry.

The pigment paper is prepared as follows:—

Common black pigment paper is placed in a bath composed of four per cent. bicarbonate of potash to one hundred per cent. water for from one to five minutes, as required, and then dried in a temperature of 60° to 70° Celsius. The paper is then exposed to the daylight for from ten minutes to two hours, according to the strength of the light, and then placed in cold water for about an hour, and then in another bath composed of about six per cent. pyrogallie acid to one hundred per cent. alcohol for about ten minutes, when it is placed in a frame or on a plate and dried.

As soon as completely dry it is covered with powdered oxide of zinc, or oxide of bismuth, which is rubbed in with the palm of the hand, thus pressing it into the deep parts, and leaving the upper parts or lines of the figures free the surplus powder being removed.

The pigment paper thus prepared is placed in front of the camera, and a negative produced in the usual way.

This negative is removed from the glass and placed between the negative of the photograph to be reproduced and a pigment paper which has been prepared with a strong solution of gelatine, containing only a small quantity of pigment, and then copied as usual, thereby producing a positive on the pigment paper with the same irregular surface as that on the negative which is necessary to print from.

The printing block is prepared as follows:—

The gypsum plate is placed under water, and upon it the positive also under water, and then the plate with the positive is removed from the water, and the positive pressed against the plate by an indiarubber roller or squeezer to remove any air that may be between, the positive closely adhering to the plate. It is then pressed slightly in a press, and then placed in a bath composed of water and ten per cent. sulpho-cyanure ammonium or rhodon ammonium, which will dissolve those parts which are not or only partially developed.

When removed from this bath and washed in cold water, it is placed in a bath composed of five per cent. chrome alum in water for about five minutes, then removed and washed and immersed in a bath of concentrated alcohol and dried, and then impressed into a plastic mass composed of bone dust, albumen, blood, and silicate of soda, the proportions depending on the hardness required. Any other plastic substance may be used, such as celluloid, cyanoid, &c., by means of an hydraulic press or other suitable means, steam being introduced during the operation, as is usual in filter presses. When cold it is removed from the press.

The claim is:—A new method of reproducing photographs, consisting in the production of a peculiar negative in connection with a black pigment paper, which, after having been exposed to the light, is covered and rubbed in with oxide of zinc, or oxide of bismuth, to transform the half tones into irregular surfaces suitable for reproduction in any printing press; copying the said negative on pigment paper and transferring it to a specially prepared gypsum plate, which is then impressed into a plastic mass composed of bone dust, albumen, blood, and silicate of soda, or any other suitable plastic substance, and then forms the definite printing block, substantially as hereinbefore described.

PHOTOGRAPHIC CAMERA LENS SHUTTER.

No. 12,250. JAMES SWIFT, 51, Tottenham Court-road, London, W.—September 27, 1886.

AN improved instantaneous and time photographic camera lens shutter, which consists of two parallel slides working in same grooves and plane, made of any suitable material, the edges of which meet and slightly overlap each other in the centre of the aperture of the camera lens with which it is used. When in action the lower segment is forced downwards by a spring, while the upper part of the shutter is thrown in the opposite direction also by a spring, thus leaving the entire aperture of the lens exposed to the action of the light. The same portion of the shutter when forced up by the spring returns by recoil and closes the aperture. The return of this part closing the aperture can be made, at the will of the operator, from a fraction of a second to any number of minutes. I further claim in my invention the method of detaining the upper segment of the shutter for time exposure before allowing it to close over the aperture of the lens; this is effected by a loose hinged piece, which is made to shift into position when required, so that the upper portion of the automatic piston arrangement for discharging the shutter when put into action comes in contact with the aforesaid hinged piece, which forces a tension spring on the upper segment of the shutter and holds it in position until the pneumatic pump is relieved by the pressure of the hand, when the piston rod descends and releases the tension on the segment of the shutter, thus allowing it to fall over the aperture of the lens. I further claim that the two segments of the shutter can when discharged be made to travel over the aperture of the lens with only a partial opening between them. This contrivance is necessary for very rapid exposures in bright atmosphere.

What I claim is, the application of the sliding shutters meeting over the aperture of the lens, only one returning to shut off the light after exposure has been made, and also the upper segment of the shutter can be retained in position for any length of time, at the will of the operator, after opening the shutter before it is allowed to descend to shut off light. I further claim the mechanical arrangement of holding the upper segment of the shutter until required to drop.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
April 19.....	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
" 19.....	North London	Myddelton Hall, Upper-st., Islington
" 19.....	Great Britain	5A, Pall Mall East.
" 19.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 20.....	Bristol and W. of Eng. Amateur	Queen's Hotel, Clifton.
" 20.....	Bury	
" 20.....	Hyde	Mechanics' Hall, Hyde.
" 20.....	Manchester Club	
" 20.....	Edinburgh Photo. Club	5, St. Andrew-square.
" 20.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 21.....	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION. On Thursday night, April 7, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. Alexander Cowan presided.

Mr. A. L. HENDERSON exhibited two photographs taken by him by artificial light at the Royal Aquarium, Westminster, representing the orchestra and stage while a performance was going on; the camera was planted upon the opposite gallery, and the time of exposure was one second with a $\frac{1}{4}$ double lens. The electric light, the limelight, and gas, took part in the illumination at that particular part of the performance. He did not know why the orchestra came out in good focus in both pictures and the actors on the stage in a slightly hazy condition; it was not the fault of the focussing, nor did anything of the kind appear with the same lens in daylight; would the artificial light make a difference in the working of the lens?

Mr. A. HADDON thought the effect to be due to unequal refraction by the warm currents of air rising from the footlights between the orchestra and the stage.

Mr. HENDERSON responded that that seemed to be the true explanation.

Mr. F. W. COX exhibited an albumenised print which had been "knocking about" for a quarter of a century, yet was nearly as good as when first printed; it had been produced by Mr. W. England.

A question in the box asked whether a patent could be sustained for stripping films.

Mr. HENDERSON asked what was the difference between Eastman's stripping films and the "diaphanous paper" once in the market.

Mr. A. MACKIE responded that the stripping film of diaphanous paper was upon albumen and not upon gelatine.

Mr. HENRICHI TRINKS remarked that in many mechanical processes gelatine had long been used to strip from paper.

The CHAIRMAN thought that the question could not be answered before knowing the claims in the patent.

Mr. MACKIE asked what was the maximum of chrome alum which could be added to gelatine.

The CHAIRMAN replied that he did not think that more than half a grain of chrome alum could be added to each twenty grains of gelatine if the latter had to be remelted, but much would depend upon the kind of gelatine. Before it had set, and if remelting were not intended, it would bear a large proportion of chrome alum.

Mr. HADDON said that if the gelatine were not intended for photographic purposes he thought that the presence of some acetic acid would enable more chrome alum to be added; in adding it the gelatine should be dissolved in the minimum of water and the chrome alum in the maximum.

Mr. HENDERSON said that once Mr. W. Cobb had called his attention to the fact that he could produce phosphorescence in his emulsion jar by rubbing it with a glass rod when there was no emulsion in it; the light might have been due to electricity. The friction of a plate against a vulcanite tray will sometimes cause light and photographic fog.

Mr. TRINKS had once had some exposed stripping films which prematurely began to strip themselves automatically, and wherever they did so they gave off phosphorescent light and fogged.

Mr. HADDON said that if a warm, dry film of gelatine were rapidly stripped from glass it was so electrical that it would stick against a wall.

Mr. MACKIE stated that Eder had suggested that the light sometimes seen in photographic operations might occasionally be of the nature of that emitted by arsenic when crystallising from its solution in hydrochloric acid.

A question in the box asked if any good practical method were known of making oxygen and hydrogen near the optical lantern and using them as fast as they were produced.

Various speakers suggested Chadwick's generator, also a plan said to have been tried in America.

The CHAIRMAN remarked that no one present seemed to have had experience in the matter.

Mr. TRINKS and Mr. HENDERSON made some remarks to the effect that the results given by a sensitometer with a luminous tablet formed but an imperfect and sometimes misleading guide to the speed of the same plates in the camera, the kind of light not being the same in both cases.

Another question asked if the range of gradation of albumenised paper could be varied at will by its mode of preparation.

Mr. HENDERSON said that if paper were to be partially fumed with ammonia in those parts where the densest portions of the negative had to be printed it would be more sensitive there.

Mr. MACKIE remarked that toning altered the gradation; it attacked the half tones more than the shadows.

Mr. J. J. BRIGNSHAW stated that the longer paper had been sensitised the less range of tone it had.

Mr. S. G. B. WOLLASTON was elected a member of the Association, and the proceedings closed.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The Committee of this Association met on Wednesday, the 6th instant.

The minutes of the previous meeting having been confirmed, Messrs. W. Budd, J. Blakey, — Cobb, A. C. Clement, L. England, T. E. Freshwater, H. J. Gifford, F. Hambly, W. H. Hyslop, F. Ince, L. Kidd, J. D. O'Connor, C. Pearce, A. C. Rees, J. A. Randall, H. Scott, W. Strickland, C. H. Trinks, — Tompsett, S. G. B. Wollaston, C. A. Watkins, and Miss M. Coulden, were elected members of the Association.

The correspondence having been dealt with, Mr. BEDFORD made a suggestion that honorary members should have the right of nominating deserving cases of non-members for the consideration of the Association. After some discussion on the subject, it was decided that a special Committee meeting be held to fully discuss the matter.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held on Tuesday, the 5th instant, at Myddelton Hall, Islington, N., Mr. J. Traill Taylor, President, in the chair, arrangements were made for an outing on Easter Monday at Maidenhead.

Messrs. T. Bird, A. Liddle, and A. Wybrant, were proposed for membership.

A question was asked as to the composition of sulpho-pyrogallol.

Mr. F. W. COX replied that Mr. Berkeley's original formula was one ounce of pyrogallol acid, four ounces of sulphite of soda, nine ounces of water, acidified with a little citric acid.

Mr. A. MACKIE believed that the Platinotype Company's solution was acidified with sulphurous acid. He found in practice that two ounces of sulphite of soda to one ounce of pyrogallol acid was sufficient.

Mr. E. CLIFTON had been experimenting with meta-bisulphite of potash in place of the sulphite of soda. He found that it preserved the developer from oxidation admirably, but that a considerably larger quantity of the alkali was required, as it contained free acid.

Mr. L. Medland showed some photographs of snow scenes, also some instantaneous views of the boat race; he also exhibited a light and portable tripod stand made by Horne & Thornthwaite.

A question was asked whether any member had had experience with the mercurial intensifier, using sulphite of soda solution instead of ammonia.

It was the experience of several members that sulphite of soda did not give as much increase of density as ammonia.

The PRESIDENT then gave a concise and interesting account of the latest improvements in stripping films.

It was announced that the next meeting would be held on Tuesday, the 19th instant, and would be a lantern meeting. Visitors are invited.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held in the Masonic Hall on Tuesday, the 5th instant,—Mr. W. B. Hatfield, Vice-President, in the chair.

An excursion to York was fixed for Wednesday, the 4th proximo.

Messrs. F. Crawshaw, J. Hunt, B. J. Taylor, E. Beck, and F. Mottershaw, were elected members.

The question-box was opened and contained two questions. "What is the best way to keep plates after exposure?" elicited a discussion in which the plan of packing them tightly in a mass film to film and glass to glass without anything between seemed to find the most favour. The other question was, "What is the best developer for a beginner, and what the best way of proceeding?" Nothing definite arose out of this beyond advice that a beginner should adhere to the directions given, modifying them only as to the amount of water (diluting for over exposure), and after gaining experience he could make further alterations.

The Secretary was asked if he had received a circular respecting the Glasgow Convention, and his attention was called to a letter in the *JOURNAL* and *News* upon the subject. It was decided that the Council report upon the matter.

Dr. Bartolomé lent a revolving stereoscope containing a collection of beautiful glass transparencies—many by Breeze, which was exhibited at the recent *converazione*.

Mr. BROMLEY also exhibited a stereoscope and many slides, both glass and paper. He stated, in answer to questions, that many of these were made from several negatives; as, for instance, in a moonlight effect the landscape portions must be placed closer together, centre to centre, than the clouds, and these later nearer again than the moon behind them, in order to secure the stereoscopic appearance.

Mr. SHARMAN brought an enlargement showing the recent excavations at the "Sphinx" from one of his own negatives.

The meeting then adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The sixth ordinary meeting of the current session was held in George-street on April 6,—Mr. Charles Fraser in the chair.

The minutes of the last meeting were read and approved. Nine candidates for admission as ordinary members were elected, and several nominations were made for election in May.

Mr. ROBERT H. BOW, C.E., read a paper on *Fixing Silver Chloride Prints by Means of Solution of Ammonia* [see page 231], and illustrated his remarks by a large number of silver prints made in the course of his experiments.

A discussion followed, in which Mr. H. Brebner, Mr. Fraser, and others, took part. A vote of thanks was accorded to Mr. Bow, who shortly replied on one or two points.

The CHAIRMAN intimated that, in deference to an unwritten law of the Society, Mr. Forgan had placed his resignation of the Presidency in the hands of the Council. He was about to enter into trade in connection with photography, and, as the members were aware, this had hitherto been regarded as a disqualification for the office; but it had been arranged that Mr. Forgan should retain his position till a suitable successor had been appointed.

A discussion took place upon difficulties occasionally met with in toning silver prints, in which a considerable number of the members engaged.

Mr. PILLANS said he had on the whole been dissatisfied with ready-sensitised paper. He frequently found a decided difference between the tone procured from the corners and that from the centre of the sheet. As an amateur he had gone over to gelatino-bromide paper.

Mr. BREBNER had known ready-sensitised paper to be as capable of yielding good tones as any other, but it did not usually tone so easily as that which professionals prepared daily. There was a tone coming into demand having a tinge of crimson in it which was not always successfully got. He found warmer tones more easily had when salt was not used, and he believed toning should be conducted in some degree of daylight.

Mr. AYTON said, with a new bath and no salt used, a warm tone was got which was distinguishable quite from a slightly toned print. If a good previous washing is not given, the hypo fixes out some of the tone along with the chloride.

Mr. BRUNS thought it well to thoroughly wash between toning and fixing. Plenty of water after toning was better than a short immersion in salt solution.

Two questions were proposed for discussion at next meeting, namely, a good test for endurance in silver prints, and a good means of intensification.

The new iris diaphragm as applied to lenses, and a curious old bath camera for wet plates, were exhibited by Mr. J. M. Turnbull.

Newman's patent shutter was exhibited and explained by Mr. J. STEELE.

A large platinum print of a group of distinguished professionals and amateurs, taken at Derby during last year's Convention, was laid upon the table, and for which Mr. Wardale had kindly presented an oak frame. It is to be hung in the Council room.

Mr. A. INGLIS also presented a large parcel of stereoscopic slides of an interesting description.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this Association was held in Lamb's Hotel, Dundee, on Thursday evening, the 7th instant,—Mr. Macdougald, Vice-President, in the chair.

A series of lantern slides illustrating the new Tay Bridge was exhibited by Mr. F. C. Caffin, C.E., Resident Assistant Engineer. The slides were from negatives taken by Mr. Caffin during the construction of the viaduct, and illustrated in a very vivid manner the vast difference in apparent stability between the old and new bridges. As each slide was thrown on the screen Mr. Caffin described the process it illustrated, and a great deal of information was given as to the construction.

A number of slides were then exhibited by Messrs. Ireland, Mathewson, and Baird.

The first outdoor meeting of the season was arranged to take place on May 25, the route proposed being by rail to Blairgowrie, then drive to Perth via Marlee, Chung, Meikleour, Kinclaven, and Scone.

Correspondence.

Correspondents should never write on both sides of the paper.

APRIL MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE.—GIFT TO THE SOCIETY OF A MAGNIFICENT ALBUM.—DEATH OF M. ROMMELAIRE.—PRESENTATION OF A NEW APPARATUS FOR EXACT FOCUSING AT ANY DISTANCE.—A NOVEL DARK SLIDE FOR FILMS.—M. FABRE ON SUTER'S LENSES.—A NOVEL MEDIUM TO ASCERTAIN THE FOCUS OF LENSES.—A NEW AND ENERGETIC DEVELOPER.—GELATINO-CHLORIDE OF SILVER EMULSION.—AN EXACT SYSTEM OF MEASURING THE RAPIDITY OF OBTURATORS (RAPID SHUTTERS).

The Photographic Society of France held their monthly meeting on Friday evening, the 1st instant, M. Bardy in the chair.

M. Lemercier offered a magnificent album of views taken by him in Algiers and Tunis. The Society accepted with thanks this liberal offer.

The death of M. Rommelaire was reported; the Chairman expressed the grief felt by the Society for the loss of one who had done so much for the progress of photography.

M. Jeanmaire presented a new kind of finder, or, as he calls it, an apparatus for focussing immediately at any distance. The apparatus is fixed on the top of the camera, and resembles the mouth of a crocodile. By a system of leverage, as soon as the operator touches the screw of the lens, in order to focus, if the front of the lens go outward the mouth of the crocodile opens, and the distance between the teeth of the upper and the lower jaw gives the distance. Supposing that the instantaneous picture of a steambat is required, the boat being two hundred yards distant, the operator can focus his lens for that distance without the aid of a focussing glass, by knowing how far open the jaws of the apparatus ought to be open for that distance. The next service which these jaws render, and which, perhaps, although coming in second rank, is the most useful, is that the distance of an ordinary sized man from the camera can be judged at once. When the jaws are full open, if the head and the feet of the man come exactly between two of the teeth of the apparatus he may be said to be ten yards distant, if his image be so small as to come between the two first teeth he is two hundred yards from the camera, and so on in mathematical proportion.

M. A. Blazy presented a new form of dark slide for films, which I consider very ingenious. I will endeavour to describe it fully if, peradventure, it may be of service to any of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY. The dark slide is made in the same fashion as the ordinary single slide, only a little thicker, so as to leave room for fifty or sixty films. On the back or the side opposite to the exposing shutter is a box the whole width of the shutter, but not so long. Through the centre of this box is a drum or axle, upon which can be wound many films. To this revolving drum is attached a crank handle, placed on the exterior of the box. Now what follows is novel. The film maker conceived the idea of making use of his packing paper to keep the light from his films and to serve in the exposure. We must now suppose the slide to be for $6\frac{1}{2} \times 4\frac{1}{2}$ films. He takes a piece or strip of black paper four and three-quarter inches wide, but several yards long if necessary. This paper is folded in lengths of six and a half inches. In each of the folds of the paper a sensitive film is introduced and gummed or pasted. When all the folds are closed very little room is taken up. The block is put into the dark frame, and the beginning of the black paper is pulled down; a film is then visible. This is placed upon the glass of the dark

slide, and the end of the black paper is wound round or fixed to the drum. The back of the dark slide is now closed and a screw is wound up, which moves forward the back board and pushes the film against the glass. The proper exposure is given, then the screw is loosened, the crank handle is turned, the paper bearing the film is wound round the drum until the second film is in front of the glass, the screw is again wound up, all is again ready for exposure, and so on until all the films have been exposed. A little criticism was not wanting as to the advisability of putting sensitive gelatino-bromide of silver preparations between paper—not only putting them between, but pressing them one against the other. The author said, that if chemically pure paper be employed no chance of accident could occur. Time will prove the value of this statement.

M. Fabre exhibited some Suter lenses, and gave a short history of photographic optics. The readers of THE BRITISH JOURNAL OF PHOTOGRAPHY are so well up in this subject by the pen as well by the lectures of the Editor, Mr. Traill Taylor, that it would be superfluous to give this lecture in full.

M. de la Baume Pluvinel, a gentleman attached to some observatory, I am inclined to believe, gave a method he had discovered of measuring the focus of photographic lenses. He finds that the most convenient method is to photograph the constellation of the Great Bear, and by measuring the angles given the focus of any lens could easily be ascertained. Many interesting negatives of this and other constellations were shown. M. de la Baume Pluvinel regretted that no blackboard was at hand, so that he could show us how these calculations are made. Decidedly, if we are obliged to study astronomy to know the focus of a lens, we may be obliged, sooner or later, to seek its manufacturer in the moon.

M. Lumiere drew the attention of the Society to the hydrosulphides as developers. It appears that their developing energy is something wonderful. It has often been said, that however rapid may be the exposure, sooner or later a developer would be discovered with which all details can be brought out. According to the negatives shown us, this desideratum has been attained. Instantaneous stereoscopic images on one side, developed by the ferrous oxalate or by the pyro, showed feeble images, whereas on the other side (with the same exposure) all details were out and a vigorous negative could be seen.

M. Tondeur exhibited lantern slides obtained by his gelatino-chloride preparations.

M. Londe gave a lecture on his method of measuring the rapidity of instantaneous shutters. He employs a diapason or tuning fork, with electrical apparatus to obtain the vibrations. On the tuning fork a quill pen is attached. This marks the vibrations during the exposure upon a glass plate blackened by means of a smoking lamp. This glass plate falls at a given rapidity, which makes an undulated line more or less open, according to the number of vibrations per second, or the rapidity of the fall of the blackened glass. M. Londe, as near as I could glean, fixes to the top of the tuning fork a square in metal, having a small hole in the centre; upon this hole is brought to play a very powerful light. Now, if a sensitive glass plate be placed behind this hole and exposed a point would be the result in the negative, but if the glass plate were allowed to fall a line would result. If, on the other hand, the diapason were made to vibrate the line would be undulated. As the number of vibrations of the tuning fork is well known, it is very easy to calculate the length of time that the light passing through the dark shutter had acted upon the sensitive plate. If the exposure had been rapid the undulations would be very few, so that by measuring these undulations the exact rapidity can be ascertained. Projections from the magic lantern of undulations obtained by different shutters showed the value of the apparatus of M. Londe.

PROF. E. STEBBING.

WAXED PAPER MEDIUM FOR STUDIOS.

To the EDITORS.

GENTLEMEN,—Acting on your suggestion in last week's "Answers to Correspondents," for the information of Mr. A. Brown, and others, who have found a difficulty in obtaining the right sort of paper for softening the light in their studios, I beg to state I had the paper made for me by Messrs. C. J. Jeffries, Wholesale Stationers, Bristol, price 8s. per ream.

Those of our fraternity who are troubled with the direct rays of the sun will find it a great boon, or to those who are obliged to submit to the nuisance of high buildings cutting off a portion of their light, the use of the paper will be found to diffuse and equalise the light. As a proof of rapidity, I took several fully exposed negatives in one second exposure each with a Wray's rapid rectilinear this morning.—I am, yours, &c.,
35 and 36, Wine-street, Bristol, April 9, 1887.

T. PROTHEROE.

THE RIGHT TO THE NEGATIVE.

To the EDITORS.

GENTLEMEN,—I do not profess to be a "high authority," or even "an authority," but with your kind indulgence send you what to me seems the proper way of looking at this question.

With deference to you, Gentlemen, and your correspondents, I do not think the claim mentioned by Mr. A. Debenham is either "unjust," "ridiculous,"

or "preposterous." The essence of the dispute is, Did the 25s. named include the total cost of the production of the negative? Answering this question fairly and honestly covers the whole matter in dispute. If the 25s. included—as I think the charge generally made for photographs does include—the cost of the production of the negative, clearly the negative, in law and equity, is the property of the purchaser, no matter what hitherto has been the custom in the photographic profession as to retaining the negative.

I would respectfully suggest, Gentlemen, that the analogy you make in your editorial of the 1st instant is no analogy at all. Putting composite photography on one side, a portrait negative can only be used for the printing of the portraits of one person. Types may be, and are, used for the printing of many things. The true and correct analogy is in what the author has to pay for the "setting" or "composition" of the types.

Types are "plant," and although it may be commonly supposed to be correct, I should like to see by what process of reasoning or law negatives—the production of which has been paid for by customers—can be legitimately considered as "assets."

Is not this matter of right to the negatives on all fours with the case of Vere Foster v. Marcus Ward & Co., decided in the Irish courts a year or two ago? It was then decided that Foster, having paid for the production of certain drawings, which were on lithographic stones, was entitled to the possession of the stones with the drawings on, on tendering the market value of the stones, *i.e.*, so much per pound weight. I think so.

Here is a parallel instance from the printing trade. A client may request an engraver and printer to design and engrave a business card, from which, say, one hundred cards are printed. As this plate may be used for such client only, of course he is charged with the cost of designing and engraving in addition to the cost of cards and printing. Now, although it is quite a common custom for the printer to retain possession of the copperplate, the printer would never dream of refusing to deliver up the plate to the client when requested to do so, and still less would he venture to reckon the said plate as an asset in his estate.

There is no hardship here, neither can there be in delivering up a negative for the production of which a photographer has been duly paid.

Mr. F. A. Bridge's method of meeting the difficulty raised might be effective in disposing of the negatives as negatives, but does not touch the matter of the "right to the negatives."—I am, yours, &c.,

28, L'orn-street, Manchester, April 4, 1887. G. A. RATRAY.

COLONIAL GRIEVANCES.

To the EDITORS.

GENTLEMEN,—Your insertion in THE BRITISH JOURNAL OF PHOTOGRAPHY of the accompanying "resolution" will much oblige. Many of our members feel much hurt at the implications contained in the article, and the matter was thoroughly discussed at the meeting named, when much spirit was shown amongst those present (a large meeting), and the accompanying resolution was unanimously adopted. I shall therefore feel grateful if you will find space for it in the earliest issue after receipt.—I am, yours, &c.,

CHAS. M. ALLEN, Hon. Sec. Q.P.S.

Diocesan Registry, George-street, Brisbane, February 28, 1887.

At a General Meeting of the Queensland Photographic Society, held at the School of Arts, Brisbane, on the 19th of February, 1887, the following resolution was unanimously adopted, and the Secretary instructed to send a copy thereof to the Editors of THE BRITISH JOURNAL OF PHOTOGRAPHY, with the request that they would kindly publish the same:—

Resolution.—"That this Society, having read and discussed the article which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY dated the 31st December, 1886, over the signature 'Monitor,' desires to formally express its disapproval of the strictures therein contained, and to protest against the implied unreasonableness of the orders sent home by members for goods, and the general tone of the said article, as unwarranted, uncalled-for, and having a tendency to mislead your general readers, who are unacquainted with the Colonies."

To the EDITORS.

GENTLEMEN,—Being the party referred to in the Queensland Photographic Society's report, whose order had been so unsatisfactorily treated by a London dealer, and the mention of which "Monitor" runs foul of in his "Eehoes" in your JOURNAL of 31st December last, I heartily thank you for your footnote to his effusion, as I fully appreciate the disadvantage at which I am placed in replying to the article.

"Monitor" gives rein to his imagination and is righteously indignant at the mere thought of such a charge being made against London dealers, for all of whom he entertains so high an opinion that it would be impossible for any of them to so sin through sheer carelessness or intentional neglect, and travels from Dan to Beersheba to find instances of foolish orders being sent them by parties who seem to think that it is but "a hop, skip, and jump" from one part of London to another.

On examination it might be found that the writer knows London as well as, if not better, than "Monitor," and when he learns the particulars of the case referred to he might tell us whether it was "sheer carelessness," intentional neglect," or if a stronger term would not be applicable to it.

The order for the goods, with the money, was sent on October 23, 1885. The mail usually takes rather less than six weeks between this and London. Acknowledgment of receipt of the money is dated January 30, 1886, and apology made for the delay, stating that the apparatus was then ready for packing and that the whole would be sent by next steamer. Nothing further was heard of it by May 9, when I wrote, if any difficulty in supplying the odd things, such as a few printing frames and the like, which any dealer would be supposed to have in stock and intended to make up the even money, to send off the apparatus advised on January 30, as being then ready without them. No notice was taken of this, so I wrote on August 27 threatening legal proceedings through a friend if goods not promptly despatched or money refunded, at the same time advising my change of address. On November 19 the bill of lading and invoice were sent with the case to my old address, seven hundred and fifty miles from here, and on November 26 the dealer says, "I now send duplicate bill of lading and have the great mortification to find that the case was by my fault sent to Mackay instead of Brisbane. How to explain all the long series of mishaps and delays have occurred to me I hardly know, except I have been out of my senses, which is probably true, for I have had worries enough to cause it." This is all very well, but unfortunately my experience with this firm is not singular, as friends when they heard of the order sent said—"I did not know it as well as they or I certainly would not have entrusted them with it." I received the case on January 16, 1887, within a week of fifteen months from the date of the order!

When any one writes to the papers it is but natural to expect that he knows something, however little, of the subject on which he discourses but when "Monitor" refers to the facilities we have in Brisbane for getting apparatus, or the general run of photographic material, it is quite evident he is grievously ignorant of how we are situated in this respect, unless he intended his remarks, as Artemus Ward would have said, "for sarkasm." The selection here is miserable in the extreme, and the prices almost prohibitive. It is not the saving of simply a few shillings, as anything we can get here is from fifty to one hundred and fifty per cent. dearer than in the old country. The treatment, however, our orders have already received does not encourage us to go into photography as we should like. Seven months since money was sent to the author (no publisher named) for a copy of a new work advertised in your JOURNAL. Nothing has been heard of it since, although enough sent to amply cover cost of book and postage. Money was also sent by another member of our Society for material for a well-known process, and the parcel asked to be sent by either of two routes. After considerable delay the invoice arrived about six or seven months ago, but neither shipping receipt nor other advice about it. Of this, too, nothing further has been heard. Another member had a large order sent home, and in due course received an array of paper and films which had never been seen here before. What they are or how to use them there is not the slightest information outside or inside the packages. If such cases have occurred amongst my own small circle, what must have happened to the fraternity in general scattered over the whole world? Yet the whine goes up continually about Colonials sending to the Continent and America for merchandise because they are promptly and often better served. Let "Monitor" induce some of the dealers he knows so intimately to cultivate this unoccupied field at least by square dealing, and I do not think there will be any cause for regrets; but at the same time kindly ask him not to run away with the notion that it is but "a hop, skip, and jump" between Brisbane and the capitals of the other Australian colonies.—I am, yours, &c.,

D. S.

Moreton-street, Brisbane, Queensland, Australia, February 24, 1887.

[We sympathise with our Colonial brethren in the treatment they have received from certain dealers, and publish their letters in the hope that it will lead to a prompt reform. We cannot but feel sorry that the large and honourable body of London dealers should have to suffer through the unwisdom (to put it mildly) of one or two of their number.—EDS.]

ENAMELLED IRON REFLECTORS.

To the EDITORS.

GENTLEMEN,—At the last Technical Meeting of the late South London Photographic Society, a very excellent white enamelled iron reflector of the usual shape was exhibited by the "Permanent Enamel Company," Plaistow.

The reflecting power of this pure white surface appeared so great that I determined try a few experiments with it, the result being that for most purposes I found it infinitely superior to the usual silvered surface, whether on copper or glass. This led me to suggest to the Company the desirability of their making plain sheets of white enamelled iron, which could be used for many photographic purposes. An experimental sheet of about eighteen inches square was ordered, and this has equalled, if not surpassed, my most sanguine expectations.

Whether as a simple reflector in the studio—an outside reflector for equalising the light over a negative or transparency to be copied—or merely in place of the sheet of cardboard or looking-glass in the retouching desk, I have found it by far the best reflecting surface I have

tried. Atmosphere has no effect upon it, and a damp sponge will at all times make it equal to new.

I understand such sheets could be made of almost any reasonable size at a cost of about 2s. 6d. to 3s. per square foot, and if two or three sizes could be decided upon as likely to be of most general use, and kept in stock at our photographic warehouses, they would doubtless find a ready sale.—I am, yours, &c.,
F. A. BRIDGE.

Exchange Column.

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

Will exchange a fifty-two inch bicycle (medium) for a rectilinear lens.—Address, H. EASON, High-street, Chipping Norton.

Wanted, rolling machine; will give value in ten-inch turnisher and background, exterior.—Address, J. MAIOR GREENWOOD, Brigbouse.

Wanted, whole-plate camera in exchange for fifty-two-inch bicycle, by Stanley, Coventry.—Address, H. RIMLINTON, East Gate Studio, Warwick.

Wanted to exchange, a 12x10 portable lens, by Perken, Son, & Rayment, for a 12x10 rapid rectilinear, by any good maker.—Address, EDWARD A. RICE, 50, Warner-road, Camberwell.

Wanted, fancy studio screen in exchange for seven-and-a-half-feet by six-and-a-half-feet backgrounds, interior and exterior.—Address, O. CARTER, Photographer, 19, Commercial-road, Bournemouth.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME or hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

R. MULLER.—The supply of the material has been discontinued.

J. W. (Scarborough).—The lens is a "caution." Is it possible that it can be genuine?

A. G. C.—Of course the paper must be fumed before it is printed. The paper must be dry before it is fumed.

T. B.—The green colour indicates the presence of copper as an impurity. Weaker acid may be used if it be pure.

A. B. C.—See reply to "Inquirer." You have no right whatever to pirate any copyright photograph whether for sale or otherwise.

A. R. F. E.—The spot is the well-known flare or ghost spot. It can be avoided by altering the relation between one of the lenses and the stop.

A. W. RANKEN.—There will, practically, be no difference between the two. The term "fifty times" or any other number of times simply means anything or nothing; the sensitometer number is what you must be guided by.

J. WHITFIELD writes: "Is it not desirable to make known that in using meta-bisulphite of potash, as recommended by Mr. Pringle, half a drachm of '880 ammonia is neutralised and made non-effective by each drachm of the salt employed? If this is not calculated for, the method won't be entirely 'rational' after all."

W. T. BARKER.—1. Separate the tube in the middle, lay aside the posterior portion, and insert in its place the front half, by which the front lens will assume a reverse position. Then employ a stop, for which there is doubtless a receptacle.—2. The alum solution may be prepared as you have been doing.—3. Earthenware dishes are the best that can be employed for the bichromate of potash solution. Tin is, however, often used for the purpose.

INQUIRER will be glad of answers to following questions: "Am I infringing the law by photographing for myself (copies not for sale) a copyright engraving lent by a friend, without any payment whatever? Also, how long do copyrights last?"—If our correspondent copies any copyright work he renders himself liable to the penalties for the piracy. The copyright in a photograph, according to the existing Act, endures for the lifetime of the author and for seven years after his death.

JUNAR.—The cause of your failure in taking large heads with the front lens of a portrait combination is evidently due to your attempting to use one of too short a focus, hence it had to be approached very close to the sitter. Of course the single lens has to be stopped down considerably in order to secure good definition, consequently it will be much slower in action than the combination in its entirety. The diagrams you refer to have so frequently appeared in our back volumes and ALMANACS that it would be a waste of space to be continually repeating them.

BLUENOSE writes: "Wishing to introduce a club portrait into my business, to be uniformly a bust portrait, vignette—the size I have not decided on, but will be 16x20 or 18x22—I am undecided which would be the best to introduce, bromide enlargements or photo-crayons. I am acquainted with the first, but have never seen any pictures made by the second (photo-erayon) process. Would you kindly inform me which would be the best for the purpose—that is, which process would make the nicest-looking enlargement from an ordinary negative? By kindly answering the above through your 'Answers to Correspondents' column you will greatly oblige."—In reply: The bromide pictures, in your hands, will doubtless prove the more satisfactory of the two; they lend themselves better to colouring and finishing in monochrome than the photo-crayons.

S. WALTHW says: "I have recently been sensitising my own paper for printing, and find I get much better tones on it than on the ready sensitised I have hitherto been purchasing. I use a fifty-grain bath, but find that the paper will not lie flat on the solution. As soon as it is placed on the solution it begins to curl up, leaving the edges bare for a time. Can this be remedied, or must I obtain a different paper? because it seems to me that the edges—from the fact that they are for a shorter time in contact with the solution—will be less sensitive than the other portions."—If our correspondent will, as soon as the paper begins to curl from the solution, gently breathe on the back it will quickly regain its original position. Another plan is to keep the paper in a slightly damp place for an hour or two before sensitising. The former plan is, however, to be preferred.

C. STEPHENSON.—Our correspondent has lately been seriously troubled with spots upon his prints, although he strictly adheres to the routine he formerly employed when this trouble did not appear. He encloses a print, and asks a suggestion as to the cause.—In reply: Had the print been mounted we might have surmised, from the appearance of the spots, that bronze powder might have been a factor in the case, but this evidently will not apply in the present instance, seeing that the prints are unmounted. They probably arise from sulphur, lime, or other deleterious substance in the water. Spots of this character seem to have been very prevalent of late. With a view to elucidate the matter, we will feel obliged if some of our correspondents troubled in this way will furnish us with details of the circumstances under which they appear.

VIGNETTE writes: "In your 'Answers to Correspondents' could you give me a little information about the inclosed carbon print? I am often troubled with little smears, like inclosed, round the edges of the vignetting. It is very rarely I get any of the marks on full lengths—only now and then on a very bright light in a face. Also at times I have a great difficulty in getting the vignettes soft at the edges. If you could give me a little of your advice you will greatly oblige."—The markings complained of may be due to one of two causes, or the two combined. One is that the tissue, either before or after sensitising, may have been touched with a moist or greasy finger; the other that the tissue was in a too soluble condition when it was used, hence its surface during the development of the picture was in an exceedingly tender condition, and therefore very liable to abrasion with the slightest touch. With tissue in this condition a very slight contact with any deleterious substance—perspiration from the fingers, for example—will enhance the evil. The remedy is to keep the sensitised tissue longer before taking it into use. With regard to the vignetting, it is much more difficult to obtain a soft gradation in carbon than with silver. We consider the example forwarded an unusually good one for double transfer, even when developed on collodion.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, April 20, 1887, will be *Development*.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—The next meeting will take place on Tuesday, the 19th instant, at Myddelton Hall, Upper-street, Islington, and will be a lantern evening. Visitors are invited.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next ordinary meeting of this Society will take place on Tuesday next, April 19, at eight p.m., at the Gallery, 5A, Pall Mall East, when a paper will be read by Mr. James Cadlett, *On Mr. Dallmeier's Proposed Alteration of the Standards for Lenses of the Photographic Society of Great Britain*.

CANADIAN PRICES.—The Photographers of Canada assembled in Convention in the city of Toronto August 17, 18, and 19, 1886, having taken into consideration the present depressed condition of the photographic business throughout the country, desire to call the attention of the public to the following facts:—That the ruinously low prices now prevailing lead to the following results:—1st. Lowering the artistic standard of the work. 2nd. The almost necessary use of cheap materials and accessories. 3rd. The employment of inferior assistance. 4th. The prevention of sufficient time and care being given to the details in the workroom. All of which tends to reduce the permanence, and consequently the real value, of photographs to our patrons.—Printed by order of the Photographic Association of Canada.—E. POOLE, Secretary.

A WARNING TO AMATEUR PRINTERS—AND OTHERS.—For the information of photographers, several of whom are amateur printers, if only to the limited extent of printing the names and titles of their pictures on the mounts, we quote the following, sent by Messrs. Elworthy & Co. to the *Coventry Standard*:—"As there are many persons, in the county of Warwick and elsewhere, who use *printing presses*, we beg to inform you that any person keeping or using a printing press, or types for printing, or a maker or seller of types or printing presses, not having given notice and obtained the certificate required, and to be produced when required, is amenable to the 39 Geo. III., c. 79, thereby incurring the penalty of £20, or imprisonment not exceeding six months nor less than three. There is no exception in the Act in favour of *amateur printers*. Moreover, all those persons who use machines or instruments—whatever called—where *types* are a part of the machinery, by which an impression is made, act in contravention of the Act, unless they comply with the essentials of that Act by giving notice and obtaining the certificate required."

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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AQUEOUS VARNISH FOR GELATINE NEGATIVES.

The question of varnishing gelatine negatives is one that has exercised the minds of photographers since a very early period in the employment of dry plates, and we question whether it will not continue to be a source of trouble for a long time to come, or until some entirely new preparation makes its appearance.

Naturally in applying a varnish to a negative film one expects it to be a protection, else why resort to the trouble of an additional operation. Yet, strange to say, some varnishes that have been employed for the purpose have proved rather destructive than protective; so much so, indeed, that many photographers we know prefer to print from their negatives without varnishing. Collodion and gelatine films differ very widely in their requirements with regard to protection as well as in the conditions to be observed. Thus, collodion, from its extremely tender nature, absolutely requires a protection of strong, tough varnish to prevent its being scratched, while gelatine, on the other hand, is robust enough in itself to resist the ordinary wear and tear of use. But gelatine, from its strong affinity for moisture, combined with its organic character, requires protection from damp as well as from contact with chemicals, and it is here that the difficulty arises.

In the case of collodion, which is not subject to injury or any considerable expansion from damp, it is a simple matter to apply a layer of tough, resinous matter which answers fairly well the purpose of guarding its tender surface; but that layer, though hard, is neither elastic nor is it impervious to moisture, two conditions that are pre-eminently required either singly or together in a perfect varnish for gelatine films. Consequently, when such a varnish is applied to gelatine it is, in the first place, no protection against damp, which penetrates through the *quasi*-protecting layer, and is absorbed by the gelatine beneath. Then the non-elastic nature of the varnish commences to operate as an absolute injury to the negative, for as the underlying gelatine film swells under the action of the moisture it has absorbed—and this, as all very well know, it will do to a very considerable extent and in a very short time—the non-elastic covering of resins is cracked and rent in all directions, rendering the negative, if not permanently useless, in all cases at least temporarily so, until the varnish is removed and replaced.

The want of damp-resisting qualities also renders such resinous varnishes useless as protection against chemical staining, a danger to which negatives which are much printed from are peculiarly liable from constant contact with silvered paper possibly slightly damp. This, as is well known, gradually but surely develops spots and stains of a reddish brown colour,

which entirely ruin the negative, and which are extremely difficult, and in too many cases impossible, of removal.

Another point of difference between collodion and gelatine is found in the fact that while the porous film of the former readily absorbs the alcoholic solution of gum resin employed as varnish, the horny and impervious gelatine film entirely refuses it. Consequently, while in the one instance the varnish is incorporated with, and forms part of the film, the one helping the other and adding to the protective power, in the case of gelatine the two layers remain isolated, and, except for surface contact, independent of one another. Each then retains its individual properties unmodified, as in the previous instance, by the mutual support given by one to the other, and as a result the gelatine preserves its affinity for moisture and its capability of expansion, and the varnish its natural brittleness.

Collodion, long since recommended and used as a substitute for, or an accessory to, ordinary varnish, is free from at least one of the faults of the latter, and has, therefore, secured a large share of favour. It is true it is not impervious to moisture, and, consequently, cannot act as a waterproof protection to the gelatine film; but it is at least sufficiently elastic to "give" to the swelling of the gelatine if the latter should become damp. In fact, by its expansion and contraction with the underlying film it is employed to protect, it obviates the difficulties experienced from the cracking of the more brittle varnish. Moreover, it is not unlikely that by suitable additions—as, for instance, of castor oil—it can be made far more impervious to damp than resinous varnishes; at any rate, it is found practically to be superior as a water resistant.

But, like resin varnishes, collodion lies completely upon the surface of the negative film, the gelatine refusing entirely to absorb it, and its protective influence against scratching and other rough usage depends therefore upon its own natural toughness, and not upon any binding together and consolidating of the particles forming the image or film, as in the case of collodion. What we want is something that will be absorbed into the gelatine film and when once dry become insoluble in water, and so, by isolating the particles of gelatine, render it non-absorptive and inexpandible. This *desideratum* is probably unattainable, at least in its strict entirety, but we may perhaps partly secure the desired result. A natural way out of the difficulty that will suggest itself is to render the film insoluble by chemical action, but unfortunately, as is well known, though it is perfectly easy to "insolubilise" gelatine in the manner referred to, the treatment does not prevent its absorbing water and consequently expanding more or less.

A suggestion that has been made more than once in the way of a remedy for this state of affairs consists in the employment

of an alkaline aqueous solution of shellac, though, so far as we know, it has not obtained very general adoption, if it be followed at all. Shellac, either bleached or unbleached, dissolves with great readiness in solution of borax or the alkaline carbonates, and when the solution thus formed is evaporated to dryness the residue is said, though not with perfect truth, to be insoluble. At any rate, it is sufficiently so to make a useful "waterproof" protective varnish for many purposes when the alkali is not an objection.

We have recently been experimenting with solutions of this character applied to gelatine negatives, and we are inclined to believe that, though perhaps not forming a practically perfect protection such as we have indicated, they are likely to be used with advantage. The aqueous lac varnish is, as may readily be supposed, not so durable by a long way as the alcoholic, especially when applied to glass or other impervious substances; but our experience with it is that, when applied to paper or other surfaces capable of absorbing it, it forms a much tougher protection than the alcoholic solution when maintained on the surface. Thus, a gelatine negative, varnished with aqueous solution of bleached lac, presents a harder and less easily scratched surface than one protected by an alcoholic varnish of unbleached lac, the latter being itself naturally harder in the unbleached state. In the one case the lac is absorbed into the film of gelatine, in the other it is not, and though the first—the lac-impregnated film—is not waterproofed, or rendered non-absorptive, it is, within certain bounds, dependent upon the strength of the varnish, capable of swelling and contracting under the influence of moisture without cracking in the manner an alcoholic varnished film will do.

The solution we have found to answer best, after trying various combinations and strengths, is composed as follows:—

Bleached lac	2 ounces.
Borax	$\frac{1}{2}$ ounce.
Carbonate of soda	1 drachm.
Glycerine.....	30 minims to 1 „
Water.....	20 fluid ounces.

Dissolve the borax and carbonate of soda in ten ounces of hot water, and throw in the lac broken into small pieces; place the containing vessel upon a clear fire, or over a gas stove, and stir until the lac is dissolved.

When dissolved, allow it to cool partially, and filter through filter-paper, after which the glycerine is added and the bulk made up to twenty ounces. Though now apparently perfectly clear, if it be set aside for a few days a sediment will be thrown down, when it may be again filtered, and then comes off beautifully bright and of a light amber colour.

To use this varnish the negative is finished, washed, and dried in the ordinary manner; it is then carefully dusted and either immersed in the varnish in a dish or the varnish is poured on to it and allowed to soak in for about a minute, after which the plate is closely drained. Under the action of the varnish the gelatine swells and absorbs the dissolved shellac, which, penetrating the film, renders a thick surface-layer unnecessary; indeed, it is preferable to drain as closely as possible. In two or three minutes the moisture will have been completely absorbed, and the surface of the negative takes a smooth, glassy appearance, showing the image in very slight relief. In the course of half an hour, at ordinary temperatures, the varnish will have dried to a perfectly smooth and beautifully even surface resembling glass itself, and presenting extreme hardness to the touch. If a thicker solution

be employed than the one given the result is not so satisfactory.

If the film so varnished be plunged into water, it will swell just as if unvarnished, but if set aside to dry spontaneously it will do so with perfect uniformity and without any of the cracking so well known in connection with an alcoholic varnish. If heat be employed, or if the solution be stronger than that given, cracking will most probably occur.

Though this appears to form an extremely tough and promising protection, we are unable to speak as to its actual durability as yet. A second coating, however, of thin alcoholic lac varnish, or of collodion, would, however, seem to offer an additional amount of permanency if the alkaline lac should show any tendency to deterioration.

PHOTOGRAPHS OF MACHINERY.

THE facility with which gelatine plates have enabled this class of work to be produced has tended to obscure the question of high excellence of results, which we take it should be the aim of every worker. The result is that though difficult subjects have been secured—subjects heretofore impossible of achievement—the general average of such photographs, at any rate of those which have come under our notice—and they have been by no means few—is no advance upon the wet plate work of twenty years ago, and in many instances there is a distinct retrogression to be noted. This is as unfortunate as, in our opinion, unnecessary, and it is worth while to elucidate the causes, in doing which we may suggest a remedy.

In many large machine shops a photographer forms part of the permanent staff, and he, if any one, should be able, by reason of the facilities he possesses, to make the best pictures of the kind it is possible to produce. But the majority of photographs of machinery are made by those who have had little experience of the work. The readiness of production is familiar nowadays to every one, and, consequently, the photographer is sent in for every little piece of work the maker takes an interest in or wishes to have copies of, though a dozen years ago it would never have occurred to him to have for his purpose anything but a woodcut from a drawing executed in the drawing office. In other words, this kind of work was in fewer hands, mainly those who made a speciality of it, and had gained experience of its requirements. One of the most successful men at photographing machinery that we ever heard of was a photographer in the north, who often actually made his negatives without either dark room or tent. He used to go to some dark corner of the place, and by one means or another so screen his plate that he never was troubled with fog, and he obtained most beautiful pictures.

The fact, however, remains that dry plates will be the plates of the future, hence it is now futile discussing questions of wet collodion, and the mode of obtaining the best results from the former is all that need occupy us at present. It must be observed at the outset that the plates best suited for portraiture are not those to be selected for use with machinery. In the earlier days of gelatine plates a slow kind was offered by most of the manufacturers, though we do not often now see them in the lists. Failing such kinds, every photographer must use his judgment, and the direction to look is for a plate that has a great thickness of film, and in which the image shows as little as possible at the back after development. This care is not always necessary, but the operator who has had more than one or two single experiences of such photographing, knows by pain

ful experience that occasions will happen when some particular machine he has to take a negative of is backed by a window, or even a brightly illuminated whitewashed wall. When this is the case his negative will be almost useless unless he have the right kind of plate; for there will be a local foginess—be it called “halation,” or what one will—that will spread for from half an inch to an inch or more on all objects in the vicinity of the window, an effect that will be intensified by the long exposure usually entailed by the commonly experienced dim illumination of the machine in the only place in which it can be taken.

Coating the back of the plates beforehand by a collodion containing aurine and eosine will very materially assist in reducing the amount of this spreading of the light; indeed, for the work this coating should be given to every plate; but with an unsuitable film the best results will not even then be possible.

It not unfrequently happens that a whitewashed wall forms the only background, and it introduces difficulties not easy to surmount. Whether owing to a general diffused illumination reflected from the back of the plate, or from the whiter surface of bromide plates being more actinic, and, when illuminated with a large space of white, reflecting from some of the lens surfaces sufficient light to cause general fog, or from other occult causes, we will not now attempt to determine, but it will be found that a picture free from fog will under the conditions be rarely produced. The best mode of avoiding the evil is to screen the lens on all sides with a piece of black velvet so disposed as to cut off from the field of view every portion of the white surface which will not be included in the negative. Where it is intended afterwards to paint out the background entirely, as is so often done in this class of work with the idea of making the machine stand out better, it will be advantageous to bring up the velvet within close proximity to the outlines of the machine, as shown by the image on the ground-glass. A little extra trouble will be thus entailed, but the enhanced beauty of the result will justify the slight expenditure of labour. It is surprising how many otherwise good negatives are evidently spoiled through this simple cause—a wide expanse of white background.

Passing now to the practical details of manipulation and exposure, we may say that a gentleman who has had much experience in the kind of photography we are discussing informed us that a camera with a folding tailboard would be practically useless to him. “You so often,” he said, “find yourself crushed up into a corner in order to get any distance at all between camera and machine, that the space wasted by an unoccupied tailboard would often be sufficient to prevent my getting a picture of any sort. But, besides that, one only wants to try once to find out the impossibility of getting all parts of a machine in correct focus if there is a quarter of a yard of tailboard under one’s chin, and a machine before the lens looking about as bright as a piece of coal in a cellar, as is so often the case with these things. You must have a camera with the ground-glass utterly unimpeded, and do your focussing from the front, as with the best forms of studio camera. Further, if you have a rack and pinion focuser instead of an endless screw, considerable gain in ease of working will be secured.”

These remarks seemed to us so pertinent and practical that we have not hesitated to give them in full. The relation of the same gentleman’s experience also of camera stands will be very useful, as it is evident that the selection of one of suitable form is a matter of great importance. He strongly advises the

use of indiarubber caps to the ends of the legs, as it often happens that the only standpoint is upon a heap of iron, upon which the pointed iron shoes of the tripod will not bite. A stand of Kennett pattern, or a modification such as Ronch’s, is a *sine qua non* from the power of obtaining variations of elevation without extreme spreading of the legs, which would often be impossible, and from the facility of adjusting to awkward standing places afforded by the power possessed by this form of shortening a leg when needed.

As we have in this brief essay left untouched questions of development and so forth, and the after treatment of negatives, we will not now dismiss our subject entirely, but will hope to return to it at some time in the near future.

HER MAJESTY has been pleased to issue a new Commission to inquire into the recent changes which have taken place in the relative values of the precious metals. It will, we are told, devolve upon the members to specially inquire whether the changes of value are due to the depreciation of silver, to the appreciation of gold, or to the two combined. We wonder if the large consumption of silver in photography will be taken into consideration by the Commission, as it now amounts to very many tons annually throughout the world. It should be borne in mind that by far the larger proportion of the silver used in photography is actually consumed, and finally lost as “silver,” which is not so with any other purpose to which the metal is applied. Whatever may be the report of the Commission, consumers of the nitrate will be very unlikely to regret the depreciation in the value of silver. Dry plate makers, and those who manufacture the ready-sensitised papers, we are sure will not.

THE following seems outrageous, but our information comes from a reliable source. A well-known amateur, on a recent visit to Deal, went to the pier with his apparatus, and tendered the usual toll. He was then informed that if he took his camera with him the toll was *ten shillings and sixpence*, but after the first visit subsequent charges would only be three shillings and sixpence. As no notice of any special toll to photographers was to be found at the gates, an explanation was demanded. The explanation was to the following effect. The local photographers had represented to the authorities that amateurs, by photographing from the pier, were causing injury to their business—hence the impost. The amateur was furthermore informed that an operator from one of the large publishing houses had, a week or two before, paid the sum mentioned for the privilege of planting his camera on the pier. He also learnt that, a short time back, an amateur who was unaware of this nowhere-else-to-be-found regulation passed on to the pier with a small apparatus, unnoticed by the toll taker, and had taken two or three pictures, when he was actually compelled by a local photographer, aided, we believe, by one of the pier officials, to draw the shutters of his slides and expose the plates to light, because he objected to pay the half-guinea charge. We know many amateur photographers, of not very extraordinary *physique* either, who would not have submitted to this outrage without a vigorous protest. If this kind of trade unionism pervades the district generally, there is small reason for wonder that Deal is so comparatively little visited as a pleasure resort.

FROM the earliest period of photography it has been a disputed point as to whether the light is, or is not, much less actinic in its character when the wind blows from an easterly than from any other direction. Be this as it may, photographers have for a long time past had ample opportunity of judging the effect, if any, that it has upon the exposure. It is seldom that we experience such a prevalence of east winds, and for so long a time, as we have of late. However, a slight variation in the actinic power of the light is far less noticeable now than it was when collodion, either wet or dry, used to be employed.

ABOUT this season of the year the light usually reaches its maximum in actinism. Every experienced photographer knows quite well that

the briefest exposures are obtained after a sharp April shower has passed over. Not only is a shorter exposure secured, but, in the opinion of many, a sharper, crisper, and a more brilliant picture is obtained. Beginners in landscape photography are apt to be misled, as to future work, by the light under the existing conditions. An apparently fully-timed negative may now be taken with a very short exposure, owing to the trees being devoid of foliage and the branches and twigs standing in bold relief against a bright sky as a background. But, later on, when the trees are covered with leaves, the light, though to all appearance as bright or even brighter, will be less actinic; then similar exposures will prove totally insufficient to obtain good negatives.

EVIDENTLY a great deal of misconception exists as to the meaning of copyright. Several inquiries have reached us of late asking if it be against the law to copy pictures which are copyright, provided the copies are not sold. Of the moral side of the question few, we imagine, will have any doubt whatever. The legal side is made perfectly clear by the Act, which is specially framed to give protection against piracy in any form, and for any purpose. Clause 1 stipulates that the owner of the copyright "shall have the sole and exclusive right of copying, engraving, reproducing, and multiplying such painting or drawing and the design thereof, or such photograph and the negative thereof, by any means and of any size," &c. In Clause 6 occurs the following:—"If any other person, not being the proprietor for the time being of copyright in any painting, drawing, or photograph, shall, without the consent of such proprietor, repeat, copy, colourably imitate, or otherwise multiply for sale, hire, exhibition, or distribution, or cause or procure to be repeated," &c. And further on, that "such person, for every such offence, shall forfeit to the proprietor of the copyright for the time being a sum not exceeding ten pounds; and all such repetitions, copies, and imitations made without such consent aforesaid, and all negatives of photographs made for the purpose of obtaining such copies, shall be forfeited to the proprietor of the copyright." These quotations will answer several queries which have recently been put, more fully than we could do in the columns devoted to answers to correspondents. It may be mentioned that the copyright in any picture lasts during the lifetime of the author of the work and for seven years after his death.

LAST year we directed attention to the fact that the French Government would not permit photographs or sketches to be made in the vicinity of any of their fortifications, and that any one infringing this law, though ignorantly, might subject himself to inconvenience. It now appears that our War Office has followed the example set by their French neighbours, and issued orders to all officers in command of troops, and especially where there are fortifications or earthworks, that under no circumstances are persons to be allowed to make sketches or take photographs of military structures without express permission. It will be desirable for photographic tourists to take note of this, as it may prevent them from being subjected to considerable annoyance.

COLONIAL GRIEVANCES.

I AM extremely sorry that the members of the Queensland Photographic Society should have deemed it necessary to call me to task by special resolution for certain remarks of mine which are alleged to imply "unreasonableness of orders sent home by members (*sic*) for goods." Beyond the fact that the complaint which formed the text of those remarks was made at a meeting of that Society, its members were as far from my thoughts when I wrote as those of any other Colonial body, and the "instances of foolish orders," which I am stated to have travelled "from Dan to Beersheba to find," resolve themselves into one from Canada, and another which I described as from a "foreign"—actually a Continental—firm.

I did certainly go so far as to suggest that there might be some satisfactory explanation of the delay which had occurred in the execution of the one order of which a member of the Queensland Society had complained, and this, in fairness to the large body of English dealers who were impugned, I still maintain I was perfectly justified in doing, knowing nothing of the case one way or another when I wrote and little more now, and making no charge against any indi-

vidual in the matter. The members of the Queensland Photographic Society would have done well before they permitted themselves in their indignant haste to pass a special resolution for my benefit, if they had reflected that they are not the sole representatives of foreign and Colonial photography—my remarks, if they had read them as *carefully* as they appear to have energetically dissembled them, referred to both—and they would then have saved themselves, I venture to think, from the somewhat ridiculous position of having fitted on a cap that was never intended for them.

The state of the case appears to be just this. A member of the Queensland Society has been unfortunate in one of his dealings with a home firm, and straightway a general charge is made—in the official report of the Society, mind—against English dealers generally, that if it were not for the slipshod way in which they treated Colonial orders the members of that particular Society would be in possession of more complete apparatus of home manufacture. If the home manufacturers and dealers in a body had protested, I should not have been surprised, and I might have assumed there was some amount of truth in the charge; but as one and all treated it with silence, I can only suppose that, as a body, they felt the imputation lay lightly on them and, no doubt, ejaculated mentally in Shakespearian language, "Let the galled jade wince, our withers are unwrung!" But when an independent voice is raised in defence of a body which, though it may include a black sheep or two, is mainly composed of strictly honourable business men, the framers of the original charge voluntarily take to themselves the rôle of "galled jade" and wince somewhat unnecessarily. For this I repeat I am sorry.

With regard to the letter of "D. S.," who acknowledges himself the author of the complaint, and of whom, by the way, "Monitor" does not "run foul," I need only refer to it to point out that a little more careful reading of my "Echoes" would have saved the trouble of writing it. I am not foolish enough to imagine that intelligent Colonials are sufficiently ignorant of England and its chief cities, to be led away by any such covert allusion to the vastness of London as that contained in the suggestion that it is more than a mere "hop, skip, and a jump" from one part of it to another. As a matter of fact it is, but I did not say so; I said from one end of *England* to the other. I can quite conceive that a dweller in any of the vast Australian colonies may, taking into consideration the limited area of Great Britain and the almost perfect means of communication, look upon it as a very simple matter to obtain, at a day or so's notice, anything that may be required, and with that idea in my mind I wrote of the hop, skip, and jump. "*Paris, c'est la France*," is a well-known proverb, but I am not aware that even the veriest of "Cockneys" would venture a similar claim for London, though "D. S.'s" better knowledge of the place than my own appears to have brought him to that frame of mind. However, independent of whether "D. S." or myself knows his way about London best, I repeat that, in my opinion, it is very unlikely (not "impossible" as he has it) that any of our respectable dealers would lay himself open to such charges as those brought.

One other little inaccuracy I would point out in "D. S.'s" reading of my "Echoes." He says I refer to the facilities in Brisbane for "getting apparatus, or the general run of photographic material," &c. If he will look again, I think he will find that I said it is *impossible* to expect such facilities in connection with "apparatus and goods of special make." So far as concerns "odd things, such as a few printing frames and the like," I should, however, have thought, not knowing anything about it, of course, but only judging from the advertisements of Australian dealers that appear annually in the ALMANAC, that they could be obtained in Brisbane; or that, at any rate, it would be as cheap and more convenient to get them from Sydney or Melbourne, though the distances may exceed the proverbial hop, skip, and jump, than from England.

And now for a final word of advice to "D. S." and others like him, who suffer from this difficulty of obtaining what they require at their own doors except at prohibitive prices. They will serve their own interests better than I could possibly do by attempting to induce, as "D. S." suggests, some of the dealers I know to practically lay themselves out to serve their occasional Colonial customers in preference to their regular home ones. My suggestion is that "D. S." and his friends should show a desire to encourage and promote native

enterprise, and so make it worth the while of Colonial dealers to keep good stocks of at any rate the "general run of photographic materials." If such a desire became evident, the selection of goods would soon cease to be "miserable in the extreme" and prices to be "prohibitive," for the dealer, if he did not manufacture, would be able to buy on better terms, and surely the freight on large quantities of goods would be cheaper than on small parcels for individual use. The same argument holds good with regard to apparatus, though undoubtedly it will take longer to establish the native manufacture; but if the demand arose, I have little doubt but the supply would be there. So long, however, as "odd things" as well as special things are ordered from abroad, it is impossible for the native dealer to keep a respectable stock, and for what he does keep he is bound to charge a price that will recompense him for loss of interest on capital locked up in goods that never sell.

In conclusion, may I express a hope that the members of the Queensland Photographic Society will give the same amount of attention at an early meeting to these lines as they did to my previous remarks, and I will ask them to believe that neither previously nor now has it been my wish to aim a single shaft at any individual or any Society. Except that it is a reply called forth by the Society's resolution, this article might have been written for any other body of photographers.

MONITOR.

DEATH OF J. B. OBERNETTER.

WITH grief do we record the sudden and quite unexpected death of J. B. Obernetter, of Munich, at the early age of forty-seven.

Herr Obernetter's name has been for quite a number of years before the photographic world as a skilled experimentalist of a very practical turn of mind. His more recent efforts were devoted to the preparation of dry plates, on a commercial basis, which should combine orthochromatic with good keeping properties, and in this he had attained quite a gratifying amount of success. He had also completed a method of photo-engraving, of which we have within the past two months seen numerous fine examples.

While we write this we are unaware whether the secret dies with the inventor or if he has communicated it to others who were connected with his business. He leaves a widow and family, who have our deep sympathies in the loss they, as well as the public, have sustained.

THE RIGHT TO A NEGATIVE.

It is well Mr. G. A. Rattray does not profess to be a "high authority," or even a simple "authority," or our faith in authorities generally might be weakened. His knowledge of the printer's business appears to be about on a *par* with his acquaintance with photographic practice, although he discourses so blithely on the subject of types.

"Types are plant," and "types may be, and are, used for the printing of many things," says our no-authority, and, therefore, they do not belong to "the author," who only pays for "the 'setting' or 'composition' of the types." But, on the other hand, "a portrait negative can only be used for the printing of the portraits of one person," and hence your correspondent assumes that it must belong to that one person—the sitter—and not to the photographer.

But the glass upon which a negative is taken can be cleaned, and the silver which composes the image can be recovered, and both can be reutilised for the production of other portrait negatives, *ergo*, by Mr. Rattray's own argument, *they do not belong to the sitter*. Then again, if "the author," as we are told, pays for the "setting" and "composition" of the types only, so the photographer's customer pays for the analogous operations of cleaning, coating, sensitising, exposing, developing, fixing, washing, drying, and varnishing the plate, the "setting and composing of the types," in fact, from which the prints are subsequently produced. And since it is permissible on the part of the printer to distribute his types for the purpose of future use, why should the photographer be debarred from cleaning the glass and recovering the silver used in the production of the plate or "types" for which the sitter, like the author, has not paid?

I purposely confine myself to the photographer's right to destroy the negative as a negative, for clearly he has no more right to employ

it for his own purposes than has the printer to use his formes of type. The negative, I maintain, as representing so much glass and recoverable silver, as distinctly belongs to the photographer as Mr. Rattray admits the types do to the printer. He says, however, that "clearly the negative, in law and equity, is the property of the purchaser;" certainly where there is a purchaser, but by his own arguments I have shown that the sitter, as he supposes, is *not* the purchaser.

Now, let us suppose that the author gives an order for the printing of, say, one thousand copies of his work, for which he is quoted a price; and, further, let us suppose that the printer has sufficient faith in the coming success of the effort to stereotype it on the chance of being called upon to print future editions. Does Mr. Rattray argue that those plates, because they can only be used for printing that particular work, belong to the author? Or does he take the view that, as the metal can be remelted and again employed to produce other stereotypes, it becomes "plant," and as such belongs to the printer? Under the latter circumstances printer and photographer are precisely upon all fours.

The two "parallel" instances quoted by your correspondent are singularly remarkable for their *want of parallelism* or for the marked manner in which they diverge from the lines he has laid down. In the case of Vere Foster v. Marcus Ward & Co., an additional consideration in the shape of the market value of the lithographic stones is mentioned, but in the case stated by Mr. Arthur Debenham this additional consideration is not only not offered but distinctly refused; while, so far as Mr. Rattray's argument is concerned, the offer of payment for the stones is tacit acknowledgment that the first payment does not include the right to the negative.

In the other instance, as is well known, it is the custom of the trade to make a charge for "one hundred cards *and plate*." Unless that be the special contract, I can inform Mr. Rattray from actual experience that he can *not* compel the engraver to deliver up the plate. After many years experience of photography and photographers, I have yet to meet with one of the latter whose everyday contract professes to be to supply "a dozen cabinets *and negative*" for whatever his charge may be.

Special contracts are undoubtedly entered into both by photographers and printers. The printer, for instance, will make a charge in the form of interest on the value of the type if the latter is kept standing, and similarly if the work be stereotyped; or in the latter case the plates may be purchased outright by the author. So, also, with the photographer; but any special arrangement of that description is quite distinct from the ordinary contract, Mr. Rattray notwithstanding.

I am quite unaware what that gentleman's calling may be, scarcely, I should imagine, either photographer or printer; he will, perhaps, give me the *tu quoque* if I advise him to emulate a certain individual and "stick to his last," for I must subscribe myself,

"NOT A PORTRAIT PHOTOGRAPHER."

A SHORT HISTORY OF PHOTOGRAPHY IN COLOURS.*

Becquerel's Experiments in Colour Photography.†—Perhaps the most successful reproductions of colour by means of photography which have ever been made were obtained by the French physicist, Edmond Becquerel, in 1848. Taking a silver plate, such as is used in Daguerreotype, he obtained a thin and very uniform coating of chloride of silver upon its surface. This he sometimes effected by soaking it in chlorine water until the silver assumed a rose tint, or by dipping it into solutions of cupric or ferric chloride. By preference, however, Becquerel placed the silver plate in a solution of hydrochloric acid, and attached to it a wire from the positive pole of a voltaic battery, the wire from the negative pole being fastened to a plate of platinum which also dipped into the acid solution. By this means the hydrochloric acid was decomposed, and the chlorine being drawn, by electrical attraction, to the silver plate combined with it chemically, forming a surface of silver chloride of great purity. As the combination of silver and chlorine took place, the layer of silver chloride gradually increased in thickness, and as it did so its colour

* Concluded from p. 230.

† See *Comptes Rendus*, 1843 and 1854; also *Annal de Chimie*, 1849.

changed to grey, yellow, violet, and blue, and, continuing the action, these colours appeared a second time. When the second violet tint had been obtained, the silver plate was withdrawn from the solution, washed, and dried, and gently heated until the surface assumed a rosy hue. When the spectrum of sunlight or of the electric arc was received upon a plate so prepared, an exposure of a few minutes was sufficient to impress the diverse colours. Coloured images of brightly dressed dolls were also obtained.

Failure in Fixing Coloured Images.—After Becquerel had obtained such favourable results, it may be asked, How is it that further progress has not been made, and why are not coloured photographs more frequently produced? The answer is that no certain means has hitherto been found of *fixing* the coloured images secured; they can only be examined in a faint light, and must be kept locked up in drawers and excluded from the day. They last longer when protected from the air, for oxygen has a detrimental effect upon the colours. Becquerel, however, appears to have succeeded in rendering more or less permanent *some*, at any rate, of his "heliochromes." One which he presented to Brewster was lent by the latter to J. Traill Taylor, who exposed it to *bright sunshine* without injury to the colours.*

Experiments by the Younger Niepce.—Niepce de St. Victor repeated Becquerel's experiments; but he found it better to form the chloride of silver by immersing the silver plate in a solution of chloride of lime.† He also reduced the time of exposure by coating the chlorinised surface with a solution of chloride of lead in dextrine. Niepce believed that a relation existed between the colours impressed and the source from which the chloride was obtained, and in 1857 he published the results of some experiments on the connection between the colours imparted to flame by certain metallic chlorides, and the colours impressed on silver plates prepared from the same chlorides. Subsequent investigations have not, however, confirmed this theory. Niepce sent specimens of his work to the Exhibition of 1862, consisting of about a dozen reproductions of prints of figures with parti-coloured draperies. Each tint in the pictures exhibited was a faithful reproduction of the original, including yellows, blues, reds, greens, &c., all very vivid. Some of the tints faded at once when these pictures were examined by daylight, but others remained for some hours.

Poitevin obtains Coloured Copies on Sensitive Paper.—In 1868‡ A. Poitevin examined and extended the results obtained by Herschel and Hunt. Taking paper sensitised in the usual way with silver chloride, he washed it and exposed the sensitive surface to light for a short period. The insolated paper was then dipped into a solution containing bichromate of potash and copper sulphate, and finally dried. When such paper was exposed to light beneath a transparent coloured picture—as a painting on glass—the colours of the picture were reproduced upon the paper. Poitevin states that the colours so obtained could be fixed by means of sulphuric acid.

Another French experimenter, St. Florent, in 1874, described§ a method of obtaining similar results in a rather different manner. Paper is soaked, first in silver nitrate and then in a mixture of uranium nitrate and zinc chloride rendered acid with hydrochloric acid. The paper is dried and exposed to light until the surface is slightly darkened: it is then floated on a solution of mercuric nitrate, again dried, and is then ready for exposure to the coloured light whose impression it is desired to secure.

Coloured Copies obtained with Paper—Abney's Researches.—With reference to coloured images obtained upon paper, Captain Abney remarks,|| "It must not be forgotten that pure salts of silver are not being dealt with as a rule. An organic salt of silver is usually mixed with chloride of silver paper, this salt being due to the sizing of the paper, which towards the red end of the spectrum is usually more sensitive than the chloride. If a piece of ordinary chloride of silver paper is exposed to the spectrum till an impression is made, it will usually be found that the blue colour of the darkened chloride is mixed with that due to the coloration of the darkened organic compound of silver in the violet region, whereas in the blue and green

this organic compound is alone affected, and is of a different colour from that of the darkened mixed chloride and organic compound. This naturally gives an impression that the different rays yield different tints, whereas this result is simply owing to the different range of sensitiveness of the bodies."

But the coloured images obtained upon Daguerreotype plates by the method of Becquerel are truly due to the distinct effects of different rays of light, for in that case there is no organic compound present to interfere with the results.

Acting on a suggestion made in December, 1865, by the then Paris correspondent of THE BRITISH JOURNAL OF PHOTOGRAPHY, R. J. Fowler (formerly of Leeds), several trials were made by English experimentalists, and in particular by J. Traill Taylor and G. Wharton Simpson, in the course of the following year to utilise collodio-chloride of silver films in obtaining coloured images. The colours obtained were not so vivid as those secured by Becquerel upon Daguerreotype plates, but they were visible by transmitted as well as by reflected light.

Pretended Discoveries of Photography in Colours.—A year seldom or never passes without the announcement in some newspaper or other that "photography in colours is at last an accomplished fact!" In some cases the "discovery" merely relates to a modification of the well-known mechanical process by which—several negatives being employed—the picture is printed piecemeal, each portion receiving a daub of a separate colour.

Other reputed "discoveries" are due to the fact that by faulty manipulation colours of some kind or other are not unfrequently obtained upon collodion—as in Hunt's example—or even on gelatine plates; or they may be the result of a splitting of the film, giving the "colours of thin plates." Some novice noting these, to him, marvellous appearances, writes in haste to the papers that he has secured the long-wished-for result—a result, however, which he finds himself unable to reproduce.

Still other cases are deliberate frauds. Thus in 1851 an American preacher named Hill obtained almost general credence for his statement that he could produce photographs "glowing with all the colours of nature!" Naturally so wonderful a process was to be called Hillotpe. The Rev. Mr. Hill obtained a considerable sum of money by inducing photographers generally to subscribe—payment in advance, of course—for a book which should contain all the details of this startling discovery. After many delays the promised book appeared, but what was the disappointment of the subscribers to find it a mere twopenny pamphlet containing the outlines of the Daguerreotype process, with complications and additions just sufficient to render the obtaining of any picture at all a very improbable matter!

Origin of the Colours obtained upon Salts of Silver.—The most recent researches upon photography in colours are those of Captain Abney.* He states that the colours obtained by Becquerel and others upon Daguerreotype plates are due to the oxidation of the silver compounds employed. When the sensitive plates are exposed in the presence of some oxidising agent, as by dipping them into peroxide of hydrogen before or during exposure, the colours are produced more speedily.

The same investigator points out that there are several known molecular combinations of bromide of silver, which can readily be distinguished from each other by the fact that they absorb different rays of light.

Thus we are acquainted with:—

(1.) A modification of silver bromide which transmits and reflects orange light. This form of the silver bromide molecule exists in paper which has been sensitised with silver bromide on plates coated with a collodio-bromide film, and on collodion bath plates. This molecule will clearly be chiefly affected by the blue rays, since it absorbs the blue end of the spectrum, and work is done only by those rays which are absorbed.

(2.) Another form of the silver bromide molecule appears of a bluish green tint by transmitted light. This modification absorbs the light of the red end of the spectrum, and even the invisible or "dark heat" rays which lie beyond the red. By taking advantage of this property, Captain Abney was enabled to obtain photographs of the

* THE BRITISH JOURNAL OF PHOTOGRAPHY, December 29, 1865.

† Series of papers in *Comptes Rendus*, 1851 to 1863.

‡ *Comptes Rendus*, 1868, vol. lxi., page 11.

§ In the *Bulletin de la Société Française de Photographie*.

|| *Encyclopædia Britannica*, vol. xviii. (ninth edition), page 835.

* *Proceedings of the Royal Society*, 1879, vol. xxix., page 190; vol. xxxiii. page 164.

region called the "ultra red," which proved its extension over a length exceeding that of the whole of the spectrum ordinarily visible.

(3.) Silver bromide contained in emulsions which have been boiled, or treated with ammonia, appears of a grey tint by transmitted light.

By an exposure of two minutes to the band of coloured light, obtained by passing a beam of white light through a spectroscope, Abney obtained coloured pictures of the solar spectrum upon silver (Daguerrotype) plates and upon collodion films. He considered the colours obtained to be due to the mixture, upon the same plate, of the first two modifications of the silver bromide molecule described above, the first absorbing the light of the blue and the second that of the red end of the spectrum.

But still the original problem confronts and baffles us. No means are known of giving permanence to the size or form of these colour-producing molecules; indeed, the molecules themselves are decomposed, or radically altered, by the ordinary "fixing" agents employed by the photographer.

Under the influence of white light the coloured molecules of silver bromide also change; they are decomposed and the colours disappear. And after all, the colours which we have as yet been able to obtain, but not to fix, by means of photography, are but faint and dim, poor reflections of the brilliant tints of nature.

In this work of obtaining naturally coloured photographs there is clearly a fine field for experiment and research. How many photographers have attempted even to confirm the results obtained by Becquerel, Niepce, and Abney? And yet what an interesting and important task this would be. The references given in this paper will enable any one who has access to a good library, such as our leading photographic societies ought each to possess, to ascertain the details of working. It is my intention to attempt something in this direction during the coming "sun season," and I should be pleased to co-operate with other chemists and physicists interested in the problem, in which case the whole ground might perhaps be gone over.

W. JEROME HARRISON, F.G.S.

ACCESSORIES OF THE LANTERN.

CHAPTER VI.—THE LECTURER'S READING DESK.

THE distance meter, described on page 215, which is used for ascertaining the right place to fix the lantern so that the image on the screen shall be of the desired dimensions, does not pretend to mathematical correctness. There is a very small difference between its indications and the theoretical positions, a difference not greater than might be produced by the over stretching of a long tape measure. The error is so trifling that it is quite unnecessary to make any allowance or correction for it in ordinary lantern exhibitions, as we are not obliged to have our pictures of any special size. As an example, we will suppose the distance meter is used for a lantern fitted with front lenses of seven inches equivalent focus, the adjustment being made on a twelve feet disc. If the meter is now used to find the correct position of the lantern for a ten feet disc the distance so found will be one inch too short; and if the lantern was accurately placed according to the meter to give a picture five, six, or eight feet in diameter, the image would be one and a quarter inches smaller than that calculated for. With discs larger than twelve feet the error would be a surplus one; in the case of a twenty feet disc the image would be one and a half inches too large. Such differences are too small to be readily detected in practice, and our simple distance meter may safely be regarded as a perfectly reliable accessory.

The illuminated reading desk is indispensable to most amateur lantern lecturers, and is of great service to professional speakers. The latter class often know their lectures so well by frequent repetition, that they are able to dispense entirely with written notes, and they find that such speaking is more effective than the reading of manuscript. There are, however, occasions when a reference to statistics, names of places, and the like, becomes necessary, and then the desk is found useful, although not needed during the whole of the discourse.

Turning to amateur or occasional speakers, we find reading to be the rule rather than the exception. Printed lectures on a variety of subjects are obtainable from the opticians, and these are in consider-

able demand, being almost invariably wanted when a set of slides is hired or purchased. As few people are born elocutionists, or have devoted special study to the art of reading aloud, the delivery of these printed lectures is usually productive of drowsiness among the audience, especially if the reader has not previously perused his piece, and is too nervous to understand it, when he is reading it before an assembly.

To be successful as a lecturer, it is necessary for the speaker to have a thorough mental grasp and comprehension of his subject, and to feel a strong personal interest in it, in order to arouse similar interest and comprehension in his audience. If he reads a joke and fails to see the point of it himself it is nine chances out of ten that the audience will also miss it. If he reads through a printed lecture, and at the end is unable to remember what he has been saying, he may be very sure that most of his listeners will go home in similar blissful ignorance. Amateur lecturers are often effective, but it is only when they are speaking from their own previously acquired knowledge of the subject which is described in their own words. If their language is not so choice and their style is not so dignified as the printed matter, their discourse is far more intelligible and interesting to the listener.

Those who are in the habit of hiring slides, and getting the descriptive information from the pamphlets supplied with them, will generally succeed best by making themselves familiar with the main features of the lecture, and writing brief notes of the names of persons, places, and statistics. Then let them rely upon their own command of language to describe the views, referring to the notes for such details as are not easily retained in the memory.

The position usually occupied by the lantern lecturer is at the side of the picture, just out of reach of the cone of rays thrown by the lantern. He is himself in semi-obscure, though he can see his audience by the light reflected from the sheet if the disc is properly illuminated. If he wishes to be seen, in order to better illustrate his meaning by gesture or expression, he stands in front of the screen, and instantly loses sight of everything save the dazzling bull's-eye of the lantern. The audience can see him but he cannot see them. He should place himself in front of the picture at a part where there are no small details. If the audience saw his features decorated with a lamp-post on the one cheek, and a donkey's head on the other, or some similar objects included in the picture then being exhibited, they would not be able to appreciate the finer shades of expression so well as if his face was unadorned in this way.

The most original idea in connection with the lecturer's position that I have met with is to use a magnified Punch and Judy stand, with an inclined plate-glass mirror therein. The mirror is perforated in the centre with a hole sufficiently large to admit of the head of the performer being passed through as far as the neck. The appearance is then that of the "floating cherub" illusion, a living head without a body suspended in space. I have never seen a lecturer deprived of his body in this manner, but I have no doubt such an apparatus would be very useful to a speaker who had more confidence in the beauty of his headpiece viewed by itself than in the appearance of his bodily framework as a whole.

A reading desk should be of simple construction, so that it can be put up in a very short time. It should be light, and should pack into a small compass for convenience of travelling. The illuminant, whether candle or lamp, should not drop grease or oil, and should not require any special care and attention. The light should fall only on the desk, no ray escaping in any other direction. The covering of the light should be small, so as not to hide the speaker and intercept his voice, and there should be means of signalling to the operator at the lantern both by the bell and by the flash of red light.

The desk may be a thin mahogany board, ten inches long and eight wide. A strip of wood is fixed on one edge to prevent the book slipping off when the board is held in the inclined position. The board should have some appliance to raise it ten or twelve inches above the table it is placed upon. This can be done by means of four laths, which are jointed to make a couple of X's. These are fitted up on the principle of the folding camp stool, with four legs and canvas seat, sold by artists' dealers. The top of our miniature camp stool is made sloping instead of being horizontal, so that the desk board, being hinged to the raised part of the canvas "seat," will rest

securely thereon at a proper angle for the reader. To pack this apparatus the jointed legs of the X's are brought together into a line with each other; they will then fold flat on the desk, and the whole can be easily put in the lantern or slide box. A strip of cretonne, or ornamental cloth, may be buttoned on three sides of the desk to conceal the stand from the view of the audience, and to impart a more showy appearance.

Another way of supporting the desk is to dispense with the table, and to mount the board on the top of a short pole or broomstick. The lower end of the pole is fitted with a projecting screw, which is inserted in the floor boards; the pole is jointed in the middle, on the fishing rod principle, for convenience of packing, and the foot is fitted with a tin cone, with a base three inches in diameter to lessen the strain on the screw. This stand is a little shaky, and after it is fixed up anywhere it is a troublesome matter to alter its position; and as every hall is provided with a small table for the platform, the table reading desk is, on the whole, preferable to the pole stand.

A tourist's folding tripod is sometimes employed as a stand for the desk; it answers fairly well, being of a proper height for reading. It does not look quite so dignified as the more substantial table, and if the lecturer happens to get excited with his discourse, and accidentally touches the desk with his waving arm, it may be knocked off the platform, and sent on a visit to the audience; or if in the obscurity he catches his foot on one of the invisible tripod legs, the whole concern may descend swiftly to the floor (as I have seen). And if by this accident something breaks, and the lamp cannot immediately be relit, the lecturer may be reduced to reading his piece by the light of a dripping tallow candle held in his left hand, while he brandishes the pointer in his right (as I have also seen). Under such circumstances the dignity and equanimity of the lecturer are jeopardised, and unless the tripod legs are screwed to the floor the plan cannot be strongly recommended.

ALBERT WM. SCOTT.

NOTES FROM AMERICA.

THE EXHIBITION OF PHOTOGRAPHS.—The first annual exhibition of photographs, comprising the work of the Photographic Society of Philadelphia, the Boston Camera Club, the Society of Amateur Photographers of New York, and many other American and foreign amateur and professional photographers, was auspiciously opened on the evening of March 26 by a well attended "private view" to members, exhibitors, and "the Press." The exhibition remained open day and evening until April 2, with lantern slide exhibitions on Monday, Wednesday, and Friday evenings. There were about eleven hundred prints exhibited in nearly four hundred frames by over ninety exhibitors. England was creditably represented by ten exhibitors; Boston, by seventeen; Philadelphia, by nineteen; New York, by thirty-eight; Austria and Prussia, by one each; while the remaining photographs were sent from various parts of the United States. Several ladies had the distinction of exhibiting some of the best work that was shown. The exhibition was varied by prints of many processes. Platinotypes, bromide, and carbon prints; cyanotypes and the usual silver prints were well represented. Besides one hundred and twenty-three lantern slides, there were twelve transparencies, which added much to the interest of the exhibition. The exhibition was in every way a complete success, and reflects much credit upon the Committee of Arrangements. One feature which showed especially considerable enterprise on the part of the managers was the catalogue giving names and numbers of prints, and the particulars concerning development and printing. This will prove a valuable *souvenir* of the exhibition. All the prints were framed, and for the most part carefully; and they were arranged so as to form more or less sharply defined panels on the walls, which gave a pleasing effect to the exhibition as a whole.

THE STEWART COLLECTION.—It was pleasant to notice the prominent part which photography played in a recent notable sale of art treasures. The famous Stewart collection of paintings—which was lately sold at auction in this country, and which excited so much interest here, outside of art circles even, that I doubt not many readers of the JOURNAL have heard of the sale on their side of the water ere this—was the subject of an illustrated catalogue *de luxe*, limited to 500 copies, containing photogravure reproductions by Mr. Ernest Edward's beautiful process of the more notable of these pictures. Some of the photogravures were made from negatives by Mr. W. Kurtz, of this city, which he exposed on the paintings under his electric lights; others were from negatives on orthochromatic

plates, and these showed very fine gradation of the colour shades. The catalogue is itself an art treasure, worthy of the famous paintings therein reproduced and of photography.

New York.

W. J. LINCOLN ADAMS.

THE PRESERVATION OF ASTRONOMICAL PHOTOGRAPHS.

IN the future, photography will be so intimately connected with astronomical research, that the permanence of the records produced by the graphical utilisation of luminous rays becomes a question of vital moment, the more particularly because in not a few cases the chief value of the photographs should consist in their giving the power of comparison with photographs of the same celestial objects taken some centuries later.

The platinum photographic process, which is probably the most permanent of all those upon paper, is inadmissible in astronomy for all purposes in which questions of exact measurement are concerned, because of the irregularities of the surface of the material and the variations in the size of the sheet with changing hygroscopic conditions. Moreover, in the act of printing from any negative, even upon the most perfect film below it, there is always some risk of the introduction of small dimensional errors, hence attention must be chiefly concentrated upon methods of making the original negatives, taken direct from the stars themselves, as nearly as possible imperishable.

A present-day negative upon a gelatine film, when coated with a good varnish, and afterwards stored under the best conditions for preservation, is known to possess a considerable degree of permanency, especially if three points have received attention, namely:—(1), That the thiosulphate of soda has been thoroughly washed out of the film; (2), that in the latter part of the manipulations the film has been subjected to the hardening influence of an alum bath; (3), that it was thoroughly dry at the time of varnishing. The perishability of coatings of varnish is, however, a matter of common experience in everyday life, and upon carefully stored negatives coated with superior varnishes, the same deteriorating influences must produce in a long time the same effects which they do in other cases in a short time. No resinous varnish seems to be damp proof. A rough-and-ready way to test the water-resisting powers of different varnishes is simply to coat useless negatives with them and to place them under water; in more or less time star-like markings make their appearance. In relation to durability, other conditions have also to be taken into consideration, such, for instance, as the tendency of some varnishes to crack and even split off with age, as with amber.

These facts suggest the idea that either varnish must not be used or that if used it must itself be protected, which principles lead us up to one of the earliest methods employed for the preservation of astronomical photographs. More than twenty years ago, when Mr. Warren De la Rue was taking photographs of the moon at his observatory at Cranford, he showed me how he rendered them to some extent durable by cementing a piece of glass over each negative with Canada balsam. The photographs were taken upon circular pieces of patent plate-glass, two and three-quarter inches in diameter; the smaller circular pieces of glass subsequently cemented upon these were two and a quarter inches in diameter. A flat plate of brass was first adjusted in a truly horizontal position by means of a circular spirit level, then it was heated, with the negative upon it, by means of small gas flames underneath; the second and smaller plate of glass, also warmed, was next laid face downwards upon the photograph, but touched it only at one part of its circumference, because a strip of paper was placed beneath the opposite part of the upper disc. A few drops of Canada balsam were then allowed to fall upon the lower plate where the upper one touched it, opposite the strip of paper; the warm balsam then by capillary attraction slowly travelled between the two plates, and when it had two-thirds occupied the space between them, the slip of paper was removed, the balsam continued to travel, and in about fifteen minutes from the commencement of the operation the union of the two glasses by balsam was complete. The object of applying the balsam in this way was to get rid of air-bubbles. For the same reason, the "feeding" of the superimposed glasses must begin only at one spot; if it be attempted to quicken operations by means of two starting points, there is danger of the two slow waves travelling between the glasses taking such a form as to enclose a bubble of air.

John Quekett, in his *Practical Treatise on the Microscope*, 1852, states that Canada balsam is not good for the cementation of microscopic slides, because after the lapse of a few years it becomes brittle, and then the slightest jar or bending will cause the glasses to split apart. He recommends marine glue as a better material for the

purpose. When the duration of the material for centuries is in question, the use of a substance so rich in indiarubber seems to be undesirable, for caoutchouc is acted upon both by air and light. Sometimes arborescent appearances form between cemented photographic lenses, due probably to the Canada balsam used as the cement having been artificially, or naturally, diluted with too much volatile oil. Mr. John Browning once told me that these arborescent markings depend upon the sample of Canada balsam used, and that if he obtains such a sample he throws it away; he states that old specimens of the balsam are most free from the defect, and that for cementing lenses he always selects as old a sample as possible.

In the years 1867-68, I had been considering the various points mentioned in this communication, and at the suggestion of an acquaintance began by getting rid of most of the volatile oil in Canada balsam by keeping it at a warm temperature for a long time. The next point was to remove its tendency to brittleness by the addition of a small proportion of castor oil, which varnish makers know to be about the best material for "toughening" varnishes, that is to say, for preventing their cracking. Thus a heavy and stable oil is substituted for the natural volatile oil in Canada balsam. Castor oil occupies a position half-way between the drying and non-drying oils; a thin film of it left exposed for an excessively long time to air will at last dry into a skin. Photographs when printed as transparencies upon glass yield fine details, which they lose when printed upon paper, so I wrote to two photographers who possessed negative portraits of Professors Faraday and Tyndall, and purchased unvarnished collodion positives printed therefrom as transparencies upon patent plate-glass. With heat I cemented with Canada balsam and castor oil a piece of patent plate-glass over the portrait films, which have since been preserved like flies in amber, and probably are the most complete and permanent portraits of those philosophers now in existence. A few days ago, after the lapse of nineteen years, I examined those transparencies; there was no perceptible change in them, indeed, none was to be expected, because many carefully kept varnished, ordinary collodion negatives will show no change after the lapse of a quarter of a century. The most interesting point was, however, that in my transparencies where the cement had been from the first squeezed out at the edges of the plates, consequently was there freely exposed to atmospheric influences, it is now not brittle but somewhat flexible and soft.

The point to be attained in the protection of astronomical photographs is, I think, to make them as imperishable in their glass and hydrocarbon coverings as the now extinct tropical hymenoptera, diptera, and other insects, which in prehistoric ages were imprisoned and preserved in the drops of gum falling from the amber trees upon the shores of the Baltic. The solution of the problem will probably be found in the use of a stable resin, such, perhaps, as amber itself, toughened with castor oil, or, perhaps, with a non-drying oil. The knowledge of the amount of permanence of any present-day astronomical photographs must necessarily be hypothetical in its nature, and he would render good service to science who would cement together a sufficient quantity of glasses by carefully recorded substances and methods, and put them under the care of some permanent scientific institution, which he should authorise to examine and report upon one batch out of the collection at the end of every century. Meanwhile, the safest plan will be to take several negatives of the same stellar objects at the same time, and trust to astronomers of the future, when symptoms of decay occur in some of the photographs, to take accurate copies of the remainder. W. H. HARRISON.

MECHANICAL OPTICAL LANTERNS.

II.

DISSOLVING view apparatus, although generally associated with two or more lanterns forming a pair or a triple lantern, with precisely similar optical systems, also include those single optical lanterns that have mechanical means for dissolving and changing the slides. In this class are lanterns fitted with Rudge's or Edwards's dissolving carrier, or Rudge's quick-changing shutter carrier, Davenport's vertical curtain screen and carrier, and the Presto dissolving carrier.

In the first two the photographs or pictures are placed in a frame sliding horizontally in a carrier fixed in the lantern, which is moved backward and forward by turning a handle acting on a cam and rack-work, or by bands and pulleys, and allows of any number being shown in turn, the same handle acting on levers and arms, to which are attached fans or discs in front of the objective lens (or on the shutters immediately over the photograph) which gradually covers up the slide last projected on the screen, then changes it and uncovers the next.

With Mr. Davenport's curtain carrier, as fitted to the Society of Arts' electric lantern, provision is made for the insertion of the slides underneath the stage, and therefore the lantern must have no projecting footboard as usually fitted, and if of the ordinary size body it must be raised about eight inches in order that a long frame may pass vertically through the stage. By an ingeniously contrived slide moving in the frame, each photograph or view after being temporarily dropped in a wooden holder can be pushed up into position and held there by a simple spring stop. The act of pushing the holder up carries with it a metal screen, cut out to such a shape as shall as nearly as possible correspond with side curtains, gradually widening from bottom to top, and finally becoming the width of the picture. As everything is reversed on the screen, it has the effect to the audience of a black curtain coming down and shutting out the picture until it is quite obscured. When this takes place the next photograph is in position in the lantern, and the previous one has been pushed up higher, so that it can be withdrawn from the top of the lantern stage. The act of drawing down the slider brings down the metal curtain (up on the screen), and a new slide holder can then be inserted. Although an excellent arrangement, no doubt, for moderately lighted single lanterns, I question it being the best form of blind or changing arrangement for an electric light lantern; for where the light is so intense on the screen, the very great change from total darkness to abnormal brilliancy is too much for the greater number of eyesights to bear comfortably, and in my opinion calculated to create a severe strain on the eye by the constantly recurring changes necessitating such a rapid contraction and expansion of the iris or diaphragm of the eye. I certainly can speak for myself when at the exhibition given at the South London Photographic Society's meeting, the pictures following each other in rapid succession on account of the number to be shown and the small amount of description necessary to each, my eyes quite ached before half the slides had been gone through. As I am accustomed to look at strong lights, and my eyes are fairly trained by testing optical instruments and experimental work to stand average strain, I think it is fair to assume that others must have found it trying. Probably the reason why some consider that the Society of Arts' lantern gives too intense a light, is due to the great contrasts alluded to; but if dissolved by means of grey or ground glasses, talc or coloured glasses, a softening effect would have been produced on the eyesight not possible with a metal or opaque curtain shaped screen.

The Presto dissolving carriers are modifications of Rudge's and Edwards's.

With these mechanical changing and dissolving carriers the operator has only to be careful to put the photograph in the right way up and proper side to light, and repeat the operation of either turning a handle or sliding the frame after inserting a fresh photograph, and then taking out the last one shown.

I know of no way in which "effects" can be shown perfectly by an unskilled operator, for they require a great amount of centering and adjusting as a preliminary, and very careful insertion into the lanterns at the time of exhibition; but much has been done by putting special adjustments to the better class of dissolving view lanterns recently made, to render it possible after once setting the pictures and effects accurately in their frames, and registering them to the lantern, to place the slides in either stage at any distance from the screen and be sure of the effect appearing in exactly the right position on the set picture, supposing the lantern stages are adjusted at that position so that the standard set of slides or registering crosses are made to coincide before starting the entertainment. As long, however, as effects are not wanted, a perfect mechanical dissolving lantern is possible, for Mr. Duncan designed and had constructed for himself a very unique piece of apparatus, that by means of two pedals worked by the feet was capable of changing the slide in either lantern and raising or lowering the lights at will so as to produce the orthodox dissolving by limelight. It was so cleverly conceived that I cannot but think a description of it will be interesting.

The lantern proper consisted of one of J. H. Steward's Bridgman triple lanterns, made specially strong, and slightly different to usual, namely, in three parts one above the other and the cut sections hinged so as to incline bodily to get superposition on screen, and not as usual by the front alone—the open part of body when inclined being covered by an ornamental moulding. To the bottom and middle lantern was attached the machinery for moving the slides or photographs through the lantern stage and apparatus for mechanically dissolving the pictures. On each side of the body are fixed two pairs of steel rectangular bars set with their edges upwards like a diamond, and on these travel a partitioned box something like the ordinary racked box to contain lantern slides, or a plate box, without one of its sides, and each held thirty-six $3\frac{1}{2} \times 3\frac{1}{2}$ photographs, therefore if all

were full it could contain one hundred and forty-four slides; as, however, the boxes on one side of lantern must be empty there are available at starting seventy-two slides. These boxes are connected together by stays and guides, and a plunger on the one side acts against the edges of the slides in the full box, and, on being actuated by the levers and pedals to which they are attached, moves the slide forward its own length (three and a quarter inches). The result of this is that the slide set in the stage, so as to show on the screen when the lantern is uncovered, is moved forward, and the dummy that helps to fill up the intervening space between the lantern body and the empty rack box is pushed into the first vacant groove. The reverse stroke of the pedal moves the groove boxes forward on the bar, a distance equal to the amount the photographs are separated, and a connecting lever lowers the light in one lantern and raises it in the other, and produces by so doing the dissolving effect. In this apparatus the top lantern was fitted with an ordinary stage for effects, and with a curtain shutter for rolling up effects; but, practically, the designer relied on the mechanical arrangement for showing the photographs and views, simply working the pedals with his feet while reading the lecture or giving a description. If a larger number than seventy-two photographs were required, other racked boxes could be inserted in place of those used up.

G. R. BAKER.

WHERE I WENT WITH THE CAMERA.

NO. III.—TO ARNHEIM AND VELP.

On leaving Rotterdam I took train for Arnheim, and as we joggled along—for even an “*express*” is a very leisurely affair here—I came to the conclusion that Holland was a country of a pattern peculiarly its own. Its scenes, its people, and its habits, all original and belonging to itself—a monopoly—and not resembling any other country I had ever seen or read about. Its landscapes lack hill and dale, yet they are picturesque in the extreme. Its people are slow, and kind, and obliging; never in a hurry, yet always moving on; with quaint manners and peculiar dress, which has that fascination for the stranger belonging to all things new.

There was water everywhere. As we pass through the country every little advance brings to view canals running down through the fields, repeating themselves at intervals regularly as lines in a copybook, and on the patches of land between were built the farmhouses, in many cases sheltered by trees, which I found grew more luxuriantly as we proceeded further into the interior of the country. Along the sides of the railway line were broad ditches or canals cut, which must be very seldom used, for a green weed covers the surface of the water completely, and the only time the water is seen is when we come across a part where some voyager has had to travel through it, thus leaving the track of his boat visibly marked. On the patches of land there were gates fitted up on each, and at the gates on every patch were the cows congregated, patiently waiting, for it was milking-time, and they knew it.

The husbandman and his wife could be seen in the distance trudging along in their leisurely way to milk the cows, carrying a pail at either side hung from a bar placed across the shoulders, and others who had already arrived were busy milking. “This land is so damp and watery,” exclaimed a friend, “that the very cows have to wear waterproofs.” And that is so. The cows in Holland wear waterproofs. And another feature about them that strikes the stranger, they are all black and white. Amongst hundreds of cattle only two or three brown or red would be seen.

As we get along the trees improve in size and foliage. Willows, the most stunted and unpicturesque of all, grow in great quantities; but this is, I suppose, for a commercial purpose, the twigs being largely used for wickerwork and basket making.

Arnheim was a fine old town when the Rhine that flows past it was a few hundreds of years younger, and for centuries it held its own against encroachment; but the walls and the moats have passed away and “a change has come over the spirit of its dream.” In the course of twenty years it has doubled its inhabitants, and it has now the credit of being a pretty, elegant, and wealthy city. Most parts of it strike one as modern, and in the march of the newer fashion the beauty and interest of bygone days is being quietly brushed out into the nothingness of the past, although away down by the landing-stage on the Rhine one could still feel the full atmosphere of Holland all around. Amongst some of the oldest buildings in the city still left is the Town Hall, or Devil’s House, as it is sometimes called on account of the grotesque carvings that adorn it, and the Cathedral, some four hundred years old. After securing various pictures of the town, new and old, I thought that I would like to get a general view of the city from the steeple of the Cathedral, and although the day was rather windy I ventured it. You all know what those steeples are. I mount five hundred steps—half-way to the sky—up at last amongst the hanging ropes and pulleys, gasping for breath and sitting down waiting till it comes, gazing up amongst the brazen bells and wondering which amongst them would be nearest in size to that Quasimodo rode and swung and made night hideous with its clash and clang. At length I gain my breath, and leaving off dreaming come down to work again. When I got out on the terrace built round the spire the wind was howling wildly—still I managed to get one picture; but when focussing for

the second one over blew my camera, which I caught just in the nick of time, but as I was in the act, right out of my hand was the focussing cloth blown over the houses and far away. I felt that I had experienced enough rough usage for one day, so I packed up my traps and descended to the level of ordinary mortals.

The walk from Arnheim to Velp, a distance of some four English miles, is very brilliant and full of interest; the trees in this part of the country are profuse and the foliage most luxuriant—a new feature of the country this for me. Beautiful avenues extend for miles and miles all around this district; beech, oak, chestnut, and linden, are all found here in profusion. Villas and mansion-houses of every varied style of architecture adorn the Velp highway, all looking in the sunshine bright and new, as if just painted that morning. Not one of them but would furnish a charming study, as each and all peer out from their nests of foliage which surround them, no matter how near the road they stand, with their airy, flowery terraces and cool verandahs bursting with blossoms dancing in the sun, whilst rustic tables, chairs, and lounges, are strewn about the lawns and grounds, all telling the story of that good time when the “pile” is made, and the world’s toil is over.

About two miles down the Velp road to the right, I came upon a large and beautiful house standing on an eminence and surrounded by its own grounds, which embraced many acres. I entered the gate and made my way up to this imposing edifice, which was all decked with flags. I found that it was called *Planten-en-Voyltaun*, and one could stay there as long as he liked—to pay, for it was a hotel combined with pleasure grounds. For a day’s enjoyment a better place could not be found. It is the resort—on Sundays especially—of the “upper ten” of Arnheim. Bands of music are then provided, and hundreds from the city gather in these grounds, which have been appointed and arranged with every inducement and care for the visitor’s pleasure and enjoyment. There are hot-houses with all kinds of exotic plants; birds and fowls on view, of every kind from every country; water fountains playing in the summer, and lakes lying ready waiting for John Frost to touch them with his wintery wand to make them ready for the skaters. Fancy dress balls are got up for the youngsters, and concerts for the oldsters, with other appropriate pleasures turning up all the year round. Verily, they know how to enjoy themselves.

On the other side of the way and nearer Velp, I reached a place of considerable interest, *Bronbeck*, a country seat that was, in 1854, bought by King William III., and presented to the country to be used as a home for the soldiers who had served in India. The corridors are hung with arms, and spoils from afar decorate the walls. The inmates of this healthy and beautiful home keep all the grounds in order themselves. They have laid aside the sword and taken to the pruning hook, the glory of war is forgotten in the rearing of roses. And like Goodale’s “career”—

“What does he do?” He prunes his roses

Near *Arnheim*, at a villa there;

’Neath soft *Holland* skies he closes

The book of life; without a care,

He smiles and takes his ease.

* * * * *

An ardent boy—he dreamed of Honour

And Fame—his heart was set upon her!

* * * * *

‘What has he done?’ He prunes his roses

And quite content, the book he closes.”

I hear the tinkling of the tram bell, and so must move along. On reaching Velp I found a village embedded in foliage, out of which I got a few good photographic studies. This place was passing rich in restaurants, with heaps of tables and chairs scattered all over the place outside, as if they were going to have a sale of second-hand furniture.

From Velp I journeyed on to the village of Rheden. MARK OUTE.

Department for Inexperienced Photographers.

SKIES AND CLOUDS.

If one examines a fine landscape having a plain white sky, devoid of either gradation or a semblance of clouds, and then turns to a duplicate print in which there is a sky covered in whole or part with clouds of beautiful form, the difference between these two in point of artistic merit will be immediately appreciable.

Photographers who prepare their pictures for exhibitions are so well aware of this, that in most cases they bestow great pains upon their skies, some of them overdoing it to the extent of reversing what ought to be the correct position of things and making the landscape subordinate to the sky, while others are guilty of the bad taste of printing in one set of clouds on every picture. We have seen in one of our public London Exhibitions a row of landscapes by a photographer of repute, all of them beautiful, but each possessing the same individual sky as its fellow. This is not seemly.

One cannot always get a fine sky when he or she arrives at a particular place and finds the scene lighted up for photographing as if “to order.”

Things terrestrial must claim immediate attention, and the sky be left out in the cold.

We shall assume that a landscape negative has eventually been secured in which every artistic and technical condition has been fulfilled. But the sky; it is a plain dark grey, and detracts from the effect. What is to be done?

If the horizon of the subject be of such a nature as to render it easy to stop out the sky altogether, this might be done. China ink and a finely pointed camel's hair pencil provide the means. It is not necessary that much more than a mere outline to the horizon be thus applied, because the mass of the sky may be blocked out by covering it on the back of the negative with opaque paper pasted on the glass, or by black varnish applied by broad sweeps of the brush. A very good way is to make a print from the negative, cut out the sky portion with a knife or scissors, allow it to continue to darken in the light, and affix this to the negative as a mask.

The result of all this is that we have obtained a well-printed landscape having an unmeaning plain white sky. A simple way of imparting an even graduated tone to the sky consists in laying the print face up on any rigid board—a cover of a book will answer—then placing upon it a plate of glass so as to keep it flat, and placing over all a sheet of card or brown paper. Now step out into a good light and expose the sky to light by slowly pulling down the brown paper cover from the top of the picture to the horizon line. If this be done steadily a beautifully graduated sky will result, one in which the top is darkest, as it usually is in Nature, lightening by imperceptible degrees until the horizon is reached, which is left nearly white. This makes a very useful and even pretty sky.

If the photographer be very skilful with the brush we could recommend him, instead of blocking out the sky, to paint on it such clouds as the nature of the subject might demand. A safer way is to have a series of cloud negatives, which may be taken at leisure and retained in stock. These negatives may either be made on glass or paper.

It will conduce greatly to the beauty of a sky if, while it is being printed in from a cloud negative, the method of grading already described be employed.

Clouds can be readily made on the back of a negative by pasting over it a sheet of thin tissue-paper, and working on it with a soft plumbago pencil or a crayon stump. Some even go the length of grinding the back of the negative with emery and water in order to ensure a tooth for the pencil touches. Ground-glass varnish will answer the same purpose, provided it be hard enough to stand the friction of the pencil.

A way we have often adopted with advantage is to make a sky negative on a collodion plate, strip the film off, and attach it to the landscape negative.

If the photographer is so happily situated as to secure a good sky in the landscape negative this is, of course, best of all; but it often happens that such cannot be done, and hence the necessity of such expedients as the subsequent printing-in of clouds.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 5308.—“Improvements in Giving Rigidity to Flexible Photographic Films.” S. H. FRY.—*Dated April 12, 1887.*

No. 5488.—“Improvements in Holders, Clips, or Easel for Photographs, Marors, Photograph Frames, Cards, and other Articles.” H. WHITFIELD.—*Dated April 15, 1887.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
April 25.....	Notts	Institute, 9, Shakespeare-street.
“ 25.....	Blackburn	“
“ 25.....	Great Britain (Technical).....	5A, Pall Mall East.
“ 26.....	Bolton Club	The Studio, Chancery-lane, Bolton.
“ 27.....	Buraley and District	“
“ 27.....	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
“ 27.....	Liverpool Amateur	Royal Institution, Colquhoun-street.
“ 28.....	Oldham	The Lyceum, Oldham.
“ 28.....	Hull	“
“ 28.....	London and Provincial	Mason's Hall, Basinghall-street.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at the ordinary weekly meeting of the above Society, held at 5A, Pall Mall East, London, Mr. James Glaisher, F.R.S., President, occupied the chair.

Mr. J. CADRETT read a paper upon *Standard Diaphragms for Lenses*, in which he said that in the standard fixed by the Society the focal length divided by four had been chosen as the unit from which to start, but that quite recently Mr. Dallmeyer had suggested that a better unit might be adopted. According to Mr. Dallmeyer's plan, ten would be the divisor of the squares of the denominators instead of sixteen in calculating the relative exposures; with small apertures this would give least trouble in calculation, but with large apertures there would not be much to choose between the two systems; by his system it was merely necessary to insert a decimal point, whereas by the Society's system it was necessary to do a sum in division. As the Society wanted all other photographic associations to accept its standard, he thought it to be better to use a decimal system of notation, especially as it was more likely then to be acceptable on the Continent. There was only one case in which division by the square root of ten, that is to say, by 3.162, would be necessary, and that was his answer to Mr. Debenham's objection on this point.

Mr. W. E. DEBENHAM premised that a standard that has the authority of the Society's recommendation, and that has been adopted in consequence, should not be altered, except for weighty reasons or manifest superiority in the one proposed to take its place. There being three distinct cases in which the use of the standards may be compared, it would be well to see which case was of the most importance as requiring ease and simplicity of calculation, and compare the accepted and proposed standards with respect to each case. The case of first importance was that of the use in the studio or field of lenses or stops which have been previously marked with a number in relation to the standard. This is of first importance because of constant occurrence, whereas the marking should be done by the optician or photographer himself at home, and once for all. In this case, the only difference favours the accepted standard, the proposed standard requiring numbers about half as large again as those at present in use. This practical advantage of the present standard, he said, had been admitted by Mr. Dallmeyer, who, however, considers it but a small one. Nevertheless, the only objection of any weight that has been made against the Society's standard is that the numbers are, when using small apertures, already high. The second case for consideration was that of forming a set of apertures of sizes to bear simple numbers in relation to the standard in use. To do this, it became necessary to first obtain a dimension representing the standard aperture, and then divide this aperture as required for the smaller openings. The Society's standard aperture is obtained by dividing the focal length by four; with the proposed standard the division is the root of ten, or 3.162, &c. It was obvious that in this case of obtaining the sizes for standardised diaphragms the present standard was far more convenient than the proposed one. The third case was that of comparing apertures that have not been cut to any standard, and numbering them in accordance with the standard. This was a case which might be expected to become more and more rare, and eventually die out, as diaphragms are cut to bear a simple relation to the standard in use. Indeed, it was worth while, on account of simplicity of calculation, to have diaphragms recut where need be, so as to enjoy that simplicity. When irregular openings have to be compared there are two methods of doing it. The method considered the simplest and easiest in most cases for those who are not opticians or mathematicians is the graphic method, and for this method a unit has to be obtained, as before, by dividing the focal length by four for the Society unit, or 3.162, &c., for the proposed one. If, however, the arithmetical method be adopted, the focal length must, for either standard, be divided by the aperture, and, with unregretted opening, both divisor and dividend will probably include several decimals. The quotient must then be squared, and where the number is high all this is such a lengthy operation that subsequent division by ten or sixteen is comparatively trifling; and, in concluding, Mr. Debenham submitted that any advantage presented by the proposed standard was far outweighed by its disadvantages in the other cases referred to.

Mr. J. R. GOTZ believed the present system to answer well, because it brought to the eye of every photographer a simple reading of the relative exposures, and he hoped the Society would adhere to its present standard, which was doing good general service. He, or rather the firm which he represented, had been the first to carry out its standards right through, and before long people would not accept any lens except upon those standards; the lenses of other makers were sometimes sent to him to have the diaphragms cut to the standards of the Society. More lenses are imported, made, and used in this country than anywhere on the Continent, and perhaps than in the whole world put together, so the Society need not trouble about the decimal system; the simple plan of giving each nearest exposure twice that of the one before answered well.

Mr. T. BOLAS said that Mr. Gotz's remarks would apply as well to any other system as to that of the standards of the Society, but the main point was to get a standard which should be most acceptable to the world at large, which would consist chiefly of foreigners. The Society might do well to invite opinions upon the subject from all the leading Continental societies, opticians, and users of lenses.

Mr. S. G. B. WOLLASTON remarked that the standard had been adopted but a short time, yet a large number of foreign opticians were already making lenses in accordance therewith and sending them to this country; perhaps those foreign makers would not adopt a fresh standard. Many lenses passed through his hands in the course of the year to test and report upon, and there was a prevalent desire that they should agree with the present standard. He thought that no material alterations should be made at present.

Mr. G. L. ADDENBROOKE said that by Mr. Dallmeyer's plan the smaller stops of landscape lenses would run into very high numbers, and then the user could not get mentally at their relative values so easily as at present in the field.

Mr. W. BEDFORD stated that the Committee of the Society which framed the standard wished it to be adopted in its entirety; had that been done by the leading opticians he did not think that any necessity would have been felt for revision. The fact that the system had been largely adopted should weigh with the Society before making any changes.

Mr. DALLMEYER said that Mr. Debenham had objected to the height of his numbers of comparison, but when the numbers became small in relation to the rapidity of the lenses, the difference became trifling. When, however, numbers of three figures were reached in the field, the stated difficulty could be

overcome by shifting the decimal point one figure higher up. Mr. Debenham's objection to the construction of the stops would apply only in one instance. It was to be regretted that the decimal standard had not been adopted before; it was simple, and the real point at issue was only as to a question of precedent. He suggested that if it were granted that there were advantages in his system, a Committee might be formed to consider it, and to see if opticians were willing to carry it out. If a Committee were to investigate, it might find that his plan could be simplified. His father had been unable to attend the meetings of the previous Committee because of ill-health.

Mr. DEBENHAM argued that Mr. Dallmeyer's simplifications were more apparent than real.

Mr. CADETT stated that both systems required the square root to be extracted, after which Mr. Dallmeyer's system became the easier. Such questions should be considered on their merits, and a particular plan not adhered to merely because it was old.

The PRESIDENT remarked that the Committee which had recommended the present standards consisted of Messrs. Warnerke, Abney, Davis, Darwin, Dallmeyer, Bedford, Brownrigg, England, Cowan, Stuart, Heaviside, and Wortley. Of these Mr. Heaviside and the late Mr. Dallmeyer had not attended any of the meetings. The Society was grateful for any fresh information on the subject, and the question was whether the Committee should be reappointed. At the meeting of the Society next Tuesday night the subject would be *Stripping Films*.

Colonel R. Malden and Mr. John R. Gotz were elected members of the Society, and the proceedings closed.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

On Thursday night, April 14, at a meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. W. E. Debenham presided.

Mr. J. TRAILL TAYLOR said, in relation to a question put at the previous meeting, that an American professor had showed him his apparatus for making oxygen near the optical lantern as fast as the jet of the latter used it up; the apparatus worked well, and at a future time he would give a description of it to the Association.

Mr. A. L. HENDERSON exhibited instantaneous photographs he had taken of the demonstration in Hyde Park on Easter Monday against the Irish Coercion Bill; he used a stand about ten feet high and reached the camera by means of a step ladder.

The CHAIRMAN remarked that, as no halation appeared in the prints where the contrasts were strong, he presumed that Mr. Henderson had used plates thickly coated with emulsion, and probably not commercial plates.

Mr. H. M. Smith exhibited a photograph which had come out tolerably well, although by accident he had placed the wrong side of the plate in the focal plane.

Mr. L. Medland exhibited some views of Maidenhead.

A question in the box asked what was the best lens for a detective camera.

Mr. TAYLOR said that for a dark day and where extreme rapidity was required a small portrait lens without a stop was the best; the next most rapid was a doublet worked at about $\frac{1}{5}$ or $\frac{1}{7}$, and of as short a focus as possible, to obviate the necessity for focussing. A lens of about five or six inches focal length would be found to be about the best for a detective camera, although lenses of shorter focus had some special advantages. Single lenses would also answer, but, he thought, scarcely so well as combination lenses. A Petzval lens on a small scale, as made for stereoscopic purposes, was excessively rapid. In answer to a question, Mr. Taylor added that he thought the best place for a stop when it was desired to avoid flare with portrait combinations was close to the front lens.

Mr. W. M. ASHMAN remarked that the best pictures taken in detective cameras which he had seen were taken by means of portrait lenses stopped down to one-half.

Mr. HENDERSON had hunted about in Paris to find a suitable make of lenses for a detective camera in which Mr. W. Cobb had an interest, and found a very neat little portrait lens which well answered the purpose.

Mr. TAYLOR stated that a correspondent had asked him what was the cause of spots on a print which he enclosed. Once a dry plate maker traced spots to dust from the indiarubber tube used as a water pipe; might not spots on prints arise sometimes from the same cause?

Mr. W. H. HARRISON said that indiarubber tubes were once made largely of French chalk, but that whitening is now substituted because it is cheaper.

Mr. A. COWAN opined that the whitening might be adulterated before the new start was made.

Mr. ASHMAN believed the spots in the print before them to be in the paper itself; there were at least twenty causes of spots, and the action of cold weather upon albumen was one of them.

Mr. TAYLOR said that dust falling from a powdery deposit on a gas jet had been known to cause spots; he thought that sulphur was one of the ingredients.

Mr. F. H. VARLEY said that if phenol were ever used for the coagulation of films of albumen, formic acid might possibly be evolved at places by decomposition and exercise a reducing action.

Mr. SMITH had obtained spots by examining the images in the printing frame under a dusty tree.

Mr. ASHMAN stated that albumenised paper kept long before sensitising was liable to produce spots.

Mr. HENDERSON said that washing in zinc troughs sometimes produced spots.

Mr. HEINRICH TRINKS thought that microscopic algae attacking albumen might possibly cause spots.

Mr. HENDERSON believed that the mixing of a light flocculent pigment with albumen would cause the latter to give better prints; the makers of albumenised paper should try it.

Mr. TAYLOR, returning to the subject of detective cameras, said that such cameras should be heavy; light ones were more liable to tremor, which could be reduced by fixing a stone to the camera; on the same principle a marksman

could shoot best with a heavy rifle. He had tried experiments on these points on the pier at Gravesend with a 5x8 camera, with which he took shoulder shots, and obtained negatives which would bear enlarging to three or four diameters; he used wide-angle lenses, probably of $\frac{1}{3}$ or $\frac{1}{4}$. He was practising level shooting, and found that he could get the horizon just where he wanted it, and that he could get any particular part of a passing ship at will in the centre of the plate; he intended to try 10x8 film photography in the same way. His shutter was of American make, and consisted of a rotating wheel with a hole in it.

Mr. J. J. BRIGNSHAW said that Mr. Lancaster made a shutter upon that principle.

Another question was, "What are the indications by which a paper negative is known to be thoroughly fixed?"

Mr. BRIGNSHAW could not see when paper negatives were properly fixed, so he left them in the hypo an unusually long time.

Mr. A. HADDON stated that in his experience it was as easy as with plates to tell when paper films were fixed, but the examination had to be made by transmitted light.

The Curator exhibited some ready-sensitised paper handed to him by the Association in December last to keep; it was advertised to keep well for nine months, and to be better than other commercial papers. It had discoloured to a great extent and was absolutely useless.

Mr. HENDERSON said that five or ten grains of citric acid added to each ounce of crystallised nitrate of silver would, when dissolved and used for sensitising, cause the paper to keep as well as most in the market; the error of most experimentalists was that they used too much citric acid.

Mr. TAYLOR remarked that Mr. Carey Lea had published that tartaric acid answered perfectly for the purpose. Paper simply floated on distilled water to remove excess after sensitising would keep its colour for a few days, and should be printed in a frame with a pad at the back which had been fumed in ammonia.

Mr. ASHMAN said that there were ready-sensitised papers in the market in a perfectly neutral state; he should like Mr. Henderson to tell them how papers could be preserved by the use of neutral salts.

The proceedings then closed.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

A SPECIAL Committee meeting was held at 181, Altersgate-street on the 18th instant for the purpose of considering proposed alteration of rules.

Rule 4.—After "Donors of one guinea and upwards shall be entitled to vote at general and special general meetings, also at the election of pensioners," add the words, "and shall further have the privilege of recommending for the consideration of the Committee cases of non-members such as are defined as urgent in Rule 13," namely, "Urgent cases are limited to such as arose from death, sudden illness, fire, or other unavoidable calamities; also when the applicant has been out of employment for a length of time and requires aid to take a situation."

Rule 10. Committee.—To read, "They shall have powers at their discretion to grant temporary assistance to applicants or cases recommended by donors under Rule 4."

Mr. W. BEDFORD, in moving these amendments, said he thought that donors should have this privilege extended to them, many of whom, having cases of distress brought under their notice, would prefer that the responsibility of dealing with them should be borne by an organized Benevolent Association, which would be in a better position to investigate the circumstances and to ensure the proper distribution of their contributions, and that by the alteration of rules empowering the Committee to act in such cases much good work would be done.

Mr. A. MACKIE, in seconding the motion, said he believed the alteration would result in increased donations, and therefore greater facilities would be afforded for carrying out the objects of the Association.

After considerable discussion the meeting unanimously adopted the proposition.

The special general meeting to confirm these alterations was fixed for Thursday, May 5, at half-past seven p.m.

At the ordinary Committee meeting Messrs. White, W. H. Dreaper, and G. S. Martin were elected members.

The SECRETARY read a letter from the London Stereoscopic Company, in which they stated their intention of holding their third annual exhibition in October next, which would be in aid of the Association, guaranteeing the benefit should not be less than twenty guineas, also making other proposals favourable to the Association.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

The ordinary meeting of the above was held on Thursday evening, April 14, at the Free Public Library.—Mr. J. A. Forrest (President) in the chair.

Messrs. A. W. Taylor, Frank N. Eaton, and J. K. Smith, were elected as members.

The PRESIDENT soon had the members thoroughly *en rapport*, by the amusing narration of an adventure which befel an old gentleman a few days previously photographing some shipping on the Mersey; he had unwittingly fixed up his camera immediately in front of the electric cannon which supplies Liverpool with Greenwich time at one o'clock. While standing with his head under the cloth diligently focussing, Bang! went the gun, the old gentleman and camera making an ignominious exit over the dock wall into the river, and being still more ignominiously fished out on the end of a boat-hook, his first and last experience, he says, with the "wet process." Mr. Forrest also showed a frame of panoramic views embracing the twenty acres on Bidston Hill, which it is hoped will be presented as a Jubilee offering by the Corporation to the public. The photographs were mounted in a long cut out card, the thin division between each not materially interfering with their continuity as a whole.

Mr. PAUL LANGE exhibited some specimens of the new form of stripped films just brought out by Messrs. Eastman. The negative being put on to

a collodionised plate of glass, the paper is stripped away by the ordinary method, and to the film remaining is squeezed one of the gelatine sheets prepared for the purpose. The whole, when dry and removed from the glass, forms an extremely thin and transparent negative. A number of prints were shown and received rather favourable criticism, as did the advantage in being able to attach the stripped films to a lighter medium than glass. Mr. Lange stated that he had found great care necessary in attaching the gelatine sheets, owing to their liability to cockle and warp.

The American air brush excited much interest on account of its novelty. It was ably demonstrated by Mr. G. E. BELL, the agent here for the American Company. By its aid in some five minutes he produced a life-sized drawing of a girl's head, which illustrated the beautiful gradations and depth of tone it is capable of rendering. A portfolio of finished drawings by him were very fine. To illustrate its usefulness in bromide and similar work Mr. Lange showed two platinotype enlargements of a head, the one finished with the air brush being immeasurably superior to the other. He said it had been found most useful in producing sky effects in paper negatives.

A number of specimens of phototype printing were passed round by the President and much admired, this process is a modification of the Heliotype, the stone being used as in lithography, any colour being obtainable. The results showed great definition and sharpness, and closely resembled the finest steel engravings.

Mr. JOHN HARGREAVES, F.R.H.S., gave the members the benefit of his researches in antiquarian lore by an amusing and descriptive account of places of historic and pictorial interest throughout Cheshire, with a view to the Association forming excursions to these spots during the summer, and so having a permanent record of their existence before they fall a victim to the tender mercies of the jerry builder.

A vote of thanks to Mr. Hargreaves brought the evening to a close.

DERBY PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of the above Society was held on Tuesday evening, April 12, at Sykes's Restaurant, 33, Victoria-street,—Mr. Richard Keene in the chair.

The subject of outdoor meetings for the summer months was discussed, and it was decided to hold the first at Dale Abbey on May 7. Mr. R. Keene will conduct the party and read a paper there on the history of the place.

The HON. SECRETARY read a recommendation from the Council to institute a competition at the outdoor excursions, and it was decided that the best picture (to be declared by vote of members) taken at these outdoor meetings be printed by the Society, and a copy presented to each member, and those receiving the second and third highest number of votes to be awarded a certificate, the whole to be exhibited at the annual *conversazione*.

Mr. J. C. MERRY then gave a practical demonstration on *How to Reduce in the Camera by Solar Light from Large Negatives for Transparencies for the Lantern*, which was greatly appreciated by the members present, and he was accorded a hearty vote of thanks.

By the desire of the members, Mr. Richard Keene will represent the Society at the meeting of the Photographic Convention, to be held at Glasgow in July next.

CHELTEMHAM PHOTOGRAPHIC SOCIETY.

The monthly meeting was held on April 14, when a demonstration was given by Mr. JOYNER of the use of the magnesium light in portraiture.

The apparatus, of Mr. Joyner's own devising, consisted of a lantern constructed as follows:—A wooden box, having at top and back glass reflectors, and in front a sloping pane of ground-glass, was suspended from the ceiling. On the floor of the box was a horizontal gas jet, connected by rubber tubing with the gas supply. Just in front of the nipple was a small wire ring which held the lower end of the doubled magnesium ribbon, its upper end being attached to a hook vertically over the ring. The gas flame during the focussing was kept just alight, and when turned up ignited the magnesium wire. To supplement the illumination two other lengths of wire were burned in front of tin reflector placed at the side and a little in front of the sitter.

The duration of the light was about six seconds, and a very fairly-exposed group of eight members was obtained with a rapid symmetrical lens, full aperture. An excellent single portrait was taken in one second with the lens stopped down.

The demonstration showed clearly the great advantage that may be derived from this light, without any expensive apparatus or complicated details.

The question of the first excursion was settled in favour of Tintern, in May.

The Secretary exhibited an actinometer sent by Messrs. Green & Fudge, of Stratford-on-Avon, and two others by Mr. Stanley, of London Bridge.

A vote of thanks to Mr. Joyner brought the meeting to a close.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

A REGULAR meeting of the above Society was held in the Mayor's Parlour, Old Town Hall, on the 13th instant,—Mr. George Bankart (President) in the chair.

The question of the approaching outdoor meetings was introduced and the members requested to give the matter their attention before the next meeting.

Mr. R. B. Blackwell was then called to the chair, and the PRESIDENT (Mr. George Bankart) read his paper on *The Influence of Little Things in Photography*. He opened by saying that numerous failures may be traced to inattention to small matters, which he instanced by the fact that dust on the plates was a fruitful source of trouble, and recommended that the transparent spots produced by it on the plates should be spotted out with a suitable medium before varnishing. Referring to exposure, he said that any hard-and-fast rule could not be laid down. One maxim he impressed on his hearers, always to expose for the shadows and let the lights take care of themselves. Development he considered secondary to exposure, as great range was permissible in this process, while in all he advocated extreme cleanliness, dirty trays being a prolific source of trouble. Exactitude in weighing and measurement was

strictly enjoined, and the rule of thumb in apportioning ammonia, pyro, and other chemicals, was much to be deprecated. Retouching he considered quite legitimate and very useful, as by its aid breadth was secured without flatness; in the case of high lights being too decided and demonstrative he recommended scraping the film with a sharp penknife and light touch to reduce them. He also advised, in landscape photography particularly, to avoid front light. He closed a clear and instructive address with a few useful hints as to printing and other matters connected with the art, and a vote of thanks was given with acclamation.

A discussion on the several points alluded to in the paper then took place among the members, their various experiences in the matters introduced being very useful.

The meeting was then adjourned until May 11, when Mr. Tucker will give his paper on *Lantern Slides by Reduction*, with practical illustrations, and from the experience he has had and the excellent work which has been produced from that quarter a very useful paper is anticipated.

CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

The monthly meeting of the above Society was held on the 15th instant,—Mr. S. W. Allen in the chair.

The election of the following gentlemen as ordinary members was confirmed:—Messrs. A. E. Evans, Powis, G. H. Wills.

The Society are indebted to Mr. D. Josti for a promised lecture on the 27th instant on *Retouching*, concluding with remarks on Rembrandt and Dord pictures.

The Society's weekly excursions for May have been arranged as follows:—May 7, Aber Valley; 14, Reforest; 21, Llandaff; 28, Cardiff Castle. The latter will be subject to permission.

MANCHESTER PHOTOGRAPHIC SOCIETY.

LANTERN SECTION.

The usual monthly meeting of the Society was held at 36, George-street on Wednesday evening, March 23, at half-past seven.

Mr. JOHN SCHOFIELD (in the chair) said he had great pleasure in introducing Mr. Leach, who had made a life study of microscopy, and who intended to show his lantern microscope in operation that evening.

Mr. WILLIAM LEACH said it gave him very great pleasure to see so many scientific gentlemen around him, and he was sure the lantern and microscope had received their careful attention. He had devoted nearly twenty years of his life to the microscope, and in trying to improve that important accessory of the lantern. His knowledge was limited in the limelight details, and he would be obliged for any hints or instructions the members would give him, and in return he would tell them all in his power about magnification and the appliances to use. Mr. Grotorex therefore took charge of the limelight, and Mr. Leach described his improvements, and handed round a printed description of the details, &c. He then exhibited a number of the most suitable objects for the screen, most of which were mounted by himself and friends, and in all cases excited a degree of admiration.

A vote of thanks to Mr. Leach followed, after which the meeting terminated.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting was held in the Technical Schools, Bridge-street, Birmingham, on the 14th instant,—Vice-President, Mr. W. J. Harrison, F.G.S., in the chair. There was a good attendance.

Messrs. G. Birkett and A. Townshend were elected as members, and Mr. Robinson was nominated for election.

Mr. J. H. PICKARD read the report of the excursion to Bridgnorth.

Well, gentlemen, although our Chairman calls for the leader's report of our excursion on Good Friday, we really had no leader, our Mr. Welford being called away on business, so that the leadership was nil. As the time was too short to appoint another to take his place, and each member who went was practically his own leader, I have just dotted down a few notes I made at the time, which may be interesting to those who went and those who were left behind.

The start was made in glorious weather from Snow-hill Station with a contingent of twenty-nine members, all told—our Mr. Hill kindly taking up the position of rear guard—and arriving at Bridgnorth at thirty-five minutes past ten. This is a fine old town, many parts dating as far back as King Alfred's daughter, Elfreda, who is stated to have built the Castle. The ancient name of the town was Bruges; it is built on the banks of the Severn, which divides the Upper from the Lower Town. After ascending the hill from the station most of the members commenced taking the Town Hall and Market-place—a very interesting relic of old buildings. Nearly all of them seemed anxious to have this picture, for every possible straight and angular picture was attempted. The old "Swan Inn" next engaged our attention, with its swinging signboard (there seems to be no fine for obstructing the streets, as here). Proceeding on through the churchyard—the church could not be taken owing to the surroundings not giving room to get a picture, even with a wide-angle lens—then down a series of steps and slides, you might term them; for what with low, narrow steps and slippery blue bricks, many members had a fine opportunity for fancy drop-slutter work. We then reached the path by the river, passing along which numerous pretty bits and views were obtained, notably the High Rocks or Tor, and Flood-gates, &c. Crossing by the ferry-boat, and then along the Appleby road, we came to the Cemetery. This is one of the most picturesque spots one could imagine for the purpose (a kind of Swiss valley). Some of us ascended the path to the top of the High Rocks, finding a splendid view therefrom. Descending, and following the road to the bridge connecting the Lower and Upper Town, the different apparatus were soon set to work again. This gives a very good picture, with river and bridge as foreground, and the house on the other side rising in tiers up the rock. Stopped by St. Stephen's Church, &c., myself, with the help of Messrs. Jaques, Taylor, &c., and a ferry-boat, gained a very good effect. On crossing the bridge we found an old timber house, said to have been Bishop Percy's residence—the date on it is 1320; but in this picture, as in most of the street views, we were cramped by the narrowness of the streets and hills; in fact, as Venice is built on the sea, so Bridgnorth may be said to be built on hills and steps. There is one passage with a quantity of steps cut through the solid rock from the Upper Town to the bridge; the former is sixty feet above the river and bridge. We then adjourned for lunch, and afterwards proceeded to the Castle Rock, on which stands St. Stephen's Church and the remains of the Castle. This has been twice besieged—once by Henry II., and again by the Parliamentary forces during the

civil war in the reign of Charles I. During the siege the Governor burnt the town to prevent the assailants approaching under cover of the houses. It was eventually taken and demolished, all but the tower. To destroy it undermining was resorted to, but the strength of the masonry and depth of the foundation only served to incline it some seventeen degrees out of the perpendicular, in which position it now remains. Many of the members took this in different positions. On passing round the Rock by the splendid Promenade Walk, very good bird's-eye views were found of the Lower Town, Bridge, and River, which could be seen winding its way through the surrounding country. We then reached the main street of the High Town, where sundry bits of views were had, such as the High Town Gate, which was once fortified, and finishing up with a group outside our hotel; and also a fine subject for a lantern slide, "King George of Bridgnorth," entitled "King Lear; or, Uncasy lies the Head which wears a Crown"—our friend, Mr. F. C. Taylor, kindly consenting to be crowned on the spot. Our repast was now ready for us by the host, Mr. Ensor, which was admirably served, and gained cause for recommendation to friends passing that way.

Reaching the station in time, Messrs. Holliday, Lewis, Iliffe, and myself, alternately had a shot at the whole party standing, sitting, and squatting on the opposite platform. I don't know how they got on, but think that my old friends—Dallmeyer, Ilford, and Beach—have helped me to win. Our train appearing, we entered the carriage and came back to Birmingham, all well satisfied with our inaugural trip of 1887.

The number of pictures taken was 180:—Ilford plate, 89; Fry's plate, 9; Wratten's, 2; Verel, 10; Bannart, 11; Eastman film, 53; Morgan & Kidd film, 6.

A number of exhibits were shown by Messrs. Leeson, Harrison, Karleese, Jaques, and Pickard, of Bridgnorth, Warwick, and other places, and taken during the Easter holidays. Mr. Harrison also exhibited some very good photographs on china plaques made by Sampson, Bridgewood, & Son, Longton.

Mr. E. H. JAQUES then gave his paper on *Instantaneous Pictures and Appliances*. In the course of his remarks he said:—

I find when showing or exhibiting photographs that the greatest attention was called to instantaneous pictures—the great variety of subjects and naturalisation of effects lent a greater charm to the ordinary land or seascape, such as sea-waves, clouds, or ships, crowds of people and other living objects, and lately have turned my attention to this class of work. I will now proceed to show you how I got the prize pictures and the apparatus, &c., by which those and all my rapid negatives are done.

The lecturer commenced with the shutters, showing a large variety, beginning with the original drop-shutter down to the most modern ones of the present day, but said he preferred, and always used, the one made by Place. This, to his idea, gave very good exposure, both for foreground and sky, and almost any speed can be got with it. Passing on he came to the view finder, or rather spot finder, to enable one to see, say, for example, when on board one steamer to be sure of having another steamship on your plate even while the vessels are both tossing on the waves:—

Having gathered from our Mr. Porter's lecture some little time back some valuable hints as to composition and the strong (*forte*) points of a picture, I made a light wire frame and fastened across four black threads, forming a corresponding design of these points. This I place on the front of the camera, and at the back, over the focusing glass, I place a piece of flat brass, which, with hole in centre, forms the eye-piece. Now, having focussed for a certain distance, I insert the slide and open same, then holding the camera by the hand (resting it on the legs to steady it), I look through the eye-piece at the frame with the crossed threads, and the moment the object required comes across the points wanted, loose the shutter with the pneumatic release, and the result is always correct.

He next spoke of having had his best successes with Paget and Ilford rapid plates, and recommended slow development, and gave the developer he uses.

A.	
Carbonate of potash	8 ounces.
Oxalate of potash	6 "
Water	30 "
Sulphuric acid	3 drops.

B.	
Sulphate of iron	4 ounces.
Water	10 "

Use one part of B to four parts of A.

To accelerate or complete the development, use drops as much as needful of
Bromide of ammonium

Ammonia

Hyposulphite of soda

He also recommended the Paget developer. The lecture was interspersed with numerous practical hints and illustrations, and was listened to with great attention and benefit.

A long discussion followed, in which Mr. Jaques gave great help, and the meeting ended by the CHAIRMAN announcing the subject of the next paper by Mr. F. Birkett, *Printing by Artificial Light*.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Society was held on April 7 in the Philosophical Society's rooms, 207, Bath-street.—Mr. William Lang, jun., F.C.S., occupied the chair.

After the preliminary business had been disposed of the following gentlemen were elected members:—Archibald Watson, Peter Anderson, Adolf Schulze, Thomas Taylor, and R. B. M. Stewart.

Thereafter the nomination of office-bearers for next session took place.

Mr. G. BELL showed some prints which were very much mottled, and explained that up to the time of coming out of the fixing bath they appeared all right, but after that the surface became quite soft, and got rubbed off in the subsequent washing. He asked if any of the members could assign a cause for this, or if any one had been troubled in the same way? The general opinion was that the silver bath was weak, and so caused the mottling complained of. Mr. Bell, however, stated that with the same bath prints that had undergone the same treatment were not injured in the least, and his opinion was that the albumenised paper was at fault. He had brought them with him, thinking it would cause some discussion, but seeing there was so much on the programme to-night, he thought it would be better to allow the matter to drop at this stage and proceed with the other business.

The PRESIDENT thereupon vacated the chair for the purpose of reading his paper, entitled *Photography and Book Illustration* [this will appear in a future number], and Mr. Urie acted as interim chairman.

The paper in question proved of most exceptional interest, the books mentioned therein being handed round for the inspection of the members.

At the close of the paper, Mr. URIE said Mr. Lang had given quite a history of the illustrating of books with silver prints from the time of Talbot down to the present day. The specimens of Talbot's were standing well while those by our own townsmen showed that Glasgow was not lagging behind. He hoped Mr. Lang would, early next session, bring forward the paper he had promised on *Books Illustrated by Other Printing Processes*, which would be of as great interest as the one they had listened to. He trusted the members would now consider the meeting open, and that they would take advantage by making any remarks or asking any questions they wished on the paper.

Mr. BELL said that the valuable collection of books shown by Mr. Lang to-night must have cost him considerable trouble and expense in gathering, and he thought Mr. Lang was to be envied as the possessor of such a fine series of illustrated books. It was a pity, however, to see so many of the pictures fading.

Mr. ARMSTRONG thought the bulk of the prints were not very far gone, considering the age of many of them, but he noticed in the later published books the fading was most marked.

Mr. STEWART mentioned that one of the Ettrick Shepherd's poems had some beautiful illustrations by the London Stereoscopic Company, and he thought the views by Frith were in the best state of preservation of any. In connection with Frith, he might state he had brought an album with some of his Eastern pictures, and the members might see it at the close of the meeting.

Mr. BROWN thought the illustrations were in a better state of preservation than many pictures done only twelve months ago; he thought this was due to the long toning they had received, depositing a quantity of gold on the surface of the prints.

Mr. URIE then moved a vote of thanks to Mr. Lang for his excellent paper, which was heartily responded to.

Mr. Lang having resumed the chair, a number of specimens of isochromatic photography from Mr. B. J. Edwards, London, were passed round, and elicited the praise of all present for their wonderful rendering of colours. One especially, an oleograph, was considered conclusive evidence of the advantage of isochromatic plates when used instead of ordinary plates for copying paintings. This picture was of a most non-actinic colour, being composed almost entirely of different shades of yellow, but yet with the use of these plates had rendered an exceedingly good photograph. When all had seen and admired these specimens, a vote of thanks was given to Mr. Edwards for so kindly sending them for inspection by the members.

Mr. Lang showed a number of early calotype negatives and prints from same, which were said to be Talbot's, and after the members had examined these and also the album brought by Mr. Stewart the meeting separated. It was to be regretted, considering the interesting nature of the meeting, that there was not a larger attendance.

PHOTOGRAPHIC SOCIETY OF INDIA.

A GENERAL meeting of the members of the Society was held on the 9th ultimo in the reading-room of the Dalhousie Institute at fifteen minutes past nine p.m. There was a good attendance of members.

Mr. JOHN S. GLADSTONE, one of the Joint Secretaries, opened the meeting by giving a short *resumé* of the working of the Society since its birth. He said that the Society was started in March, 1886, that Committee meetings had been held from time to time, and that the present was the fourth general meeting. At some of the earlier Committee meetings the question of holding a public exhibition in Calcutta during the cold season of 1886 had been discussed, but it was eventually decided to defer it until the end of the current year, and instead to invite members to send specimens of their work for private exhibition. A circular was accordingly issued to this effect. In response, about eighty pictures had been submitted which were now on view in the room. The Committee considered that these photographs were certainly a credit to the exhibitors. With regard to the future, an enlarging lantern of the newest design had been indented for from England, and would, no doubt, prove of great use to members. Mr. Gladstone then called upon his colleague, Mr. A. FLEMING, to inform the meeting of the financial position of the Society.

Mr. FLEMING said the Society at present numbered about sixty-five members, and financially might be considered to be in a prosperous condition. He was glad to observe that the number of members was increasing steadily. He regretted that considerable delay had occurred in putting the Society on a working footing. He was glad, however, to report that all difficulties had now been overcome, and there was every reason to hope that the success of the Society had been assured.

Sir BENJAMIN SIMPSON, M.D., who had kindly responded to an invitation to address the meeting, then gave some very practical and pithy advice on the best means of developing some of the objects for which the Society had been inaugurated. The proposal to secure a central and convenient place for members to meet, he thought, might be best arranged in communication with Colonel Waterhouse. The old Bengal Photographic Society used to meet in the rooms of the Asiatic Society, and he suggested that Colonel Waterhouse, who was also President of that Society, might be asked to use his interest to procure for the Photographic Society of India the privilege of meeting in the Asiatic Society's rooms. With regard to the proposed annual exhibition of photographs, he was afraid that the attractions of the cold weather season would render the exhibition in Calcutta hardly so successful as one in Simla. But, on the other hand, the space at the rooms of the Simla Society of Fine Arts was too limited to warrant him recommending the Photographic Society to seek to hold their annual exhibition there, so, on the whole, he thought if the Society made the exhibition a very interesting and varied one, by being liberal in their prizes, Calcutta in the cold season would be the best place to hold it. There were, however, many members living on the other side of India who would be debarred from judging the progress of photography if these exhibitions were restricted to Calcutta, and on this account he would suggest that the best of the collection, including the prize photographs, should be sent every year for exhibition to Simla. The young Society, he thought, should be careful to attract members by avoidance of anything tending to localise the

scope of its usefulness. It was indispensable to success that its influences should be felt throughout India. It professed to help all who cared to embark on the fascinating study of photography, and he had no doubt that the Committee would bear this in mind. A great deal was to be done by correspondence, especially in the exchange of good photographs and apparatus between members. He thought that an opportunity should be sought to foster the publication of whatever was interesting and profitable, connected not only with the Society itself, but with photography in India generally. The proposal to send each member a copy of the photograph selected by the Committee, as the best specimen submitted to the private exhibition, was an excellent beginning of the real work now being done by the Society. He looked forward to the time when the Photographic Society of India would have more than fulfilled the objects for which it had been inaugurated.

After a pleasant evening the meeting separated, having first proposed a vote of thanks to Sir Benjamin Simpson for his advice.

Correspondence.

THE RIGHT TO THE NEGATIVE.

To the Editors.

GENTLEMEN,—With reference to Mr. Rattray's letter on this subject in your last issue, I do not see that the instance he gives respecting the engraving of a copperplate to order, bears upon the subject at all. When a client gives an order for a copperplate to be engraved for a business card, or any other purpose, he does so with a full knowledge that the plate will be his own property; he is told the cost of the plate and the cost of the cards, or what not, but with photographers this is not so. When a client comes into the photographic studio and inquires the price per dozen of *cartes-de-visite*, or cabinets, as the case may be, he is quoted for what he asks, namely, the pictures and not the negative. Of course, when a photographer fixes his prices he includes the cost of the negative in his working expenses, as he does all other expenses incurred in the execution of the work, but I fail to see that he forfeits his right to the negative for that reason. It has simply been *his means* of producing the work ordered. Upon the same principle one might give an artist an order to paint a picture and then demand his brushes, as having been the means of producing the work; and I presume an artist, when quoting a price for work, has to take into consideration the cost of his materials, the same as a photographer or any other business man.—I am, yours, &c.,

73, Grove-street, Derby, April 18, 1887.

E. J. LOVEJOY.

To the Editors.

GENTLEMEN,—With regard to the question of the ownership of the negative, I remember some time back a case was tried regarding the ownership of a negative of a building, the invoice having been made out,—

To taking negative and — copies £

It was held on the face of the invoice that the amount charged included the negative and it was ordered to be given up.

With regard to the ordinary practice, as the price list is for so many copies, as soon as the copies are delivered and paid for the contract is completed; no reference having been made to the negative in the contract it would appear the client cannot claim it.

In Paris a case has recently been heard in which Count D'Agoult brought a suit against M. Adam Salomon, and claimed the negatives of several members of his family, and judgment was given that a photographer cannot exhibit nor sell the portrait of his customers without their consent, but it has also decided, on the other hand, that the negatives belong to the photographer, and cannot be claimed by the sitters.

I regret just at the moment I cannot recall the names of the parties interested in the first instance quoted, but will have another search through my papers, and if I can find the case will let you know at once.—I am, yours, &c.,

G. S.

META-BISULPHITE OF POTASH.

To the Editors.

GENTLEMEN,—I must thank your correspondent, Mr. J. Whitfield, whose letter I see quoted in your "Answers to Correspondents," for reminding me that I ought to have mentioned in my paper on *Rational Development* that the use of meta-bisulphite of potash entails an extra amount of alkali in development. I was not aware before I read the said quotation of the exact proportion of alkali neutralised by the acid, for I never actually tested it.

Having made further experiments of late, I find that even half the quantity of the potash salt will preserve the pyro, that is to say, half an ounce of the bisulphite will keep one ounce of pyro in ten per cent. solution quite clear for a long time; I have not yet got beyond two months. Possibly even less of the potash salt will serve the purpose practically. But in all cases Mr. Whitfield's warning must be kept in mind, namely, that extra alkali is required. If the sulphite of soda, or what is called "sulpho-pyrogallol," be over acidified the result will be the same. The reason is obvious and identical in the two cases.

My chief reason for preferring the potash to the soda solution is that the former is more easily, speedily, and certainly prepared. The sodic

sulphite is used in larger quantity, is not easily dissolved, and requires careful neutralisation with acid, while the other is simply dissolved with complete ease and needs no further treatment. In use the one seems to be as good as the other.—I am, yours, &c.,

ANDREW PRINOLEZ.

Langholm, April 16, 1887.

A FORTHCOMING AMATEUR EXHIBITION.

To the Editors.

GENTLEMEN,—Will you allow us, through the medium of your columns, to acquaint those of your readers who may be amateur photographers, that it is the intention of this Company to hold its third Annual International Photographic Exhibition some time during the autumn months, particulars of which can be obtained on inquiry? We purpose giving away in prizes the sum of £50 (in cash), together with a number of gold, silver, and bronze medals; we have decided to make an entrance fee of 2s. 6d., which sum, together with all donations collected from the boxes, will be handed over by us in full to the Treasurer of the Photographers' Benevolent Association. Last year some hundreds of amateurs competed, and as we this year have every reason to anticipate an equal or even greater success, we should be enabled to hand to the Association a fair sum.—We are, yours, &c.,

THE STEREOSCOPIC AND PHOTOGRAPHIC COMPANY, LIMITED.

51, Cheapside, London, E.C., April 19, 1887.

COLONIAL GRIEVANCES, &c.

To the Editors.

GENTLEMEN,—I was very glad to see that a Colonial Photographic Society took up the question of the trouble one experiences in obtaining from England supplies of photographic material.

In 1881 I wrote two or three letters from Madras to a journal on the same subject, and for a year or two after that time I continued to experience similar delay, but since 1883, I am thankful to say, I have dealt with a firm who invariably owns receipt of letters and remittances by return of post and sends out the goods within two weeks of receipt of order; another firm has also sent me out supplies of most excellent sensitised paper with the strictest regularity.

"Monitor" implies that ordinary chemicals are as readily obtainable in any of the big cities in the Colonies as in London. This is not the case, for I have frequently tried to obtain such ordinary chemicals as "sulphite of soda," "chloride of platinum," "bromide of zinc," "chrome alum," &c., but failed so far as Madras and Bombay are concerned.

In your *JOURNAL* of the 8th instant, there appears a communication from Colonel Waterhouse, giving details of arrangements for developing gelatine plates in hot climates. For many years in Madras I used similar precautions, but early in 1886 I found I could develop my plates *without the use of ice at any stage*, by merely adding to each two ounces of developer thirty to sixty minims of chrome alum saturated solution.

With this addition I developed one dozen plates, one morning last August, in Madras, when the temperature of my dark room must have been considerably over 100°, and not a sign of blister or frill was to be seen. The plates were Edwards's special instantaneous.—I am, yours, &c.,

MADRAS.

9, Campbell-terrace, Southsea, April 20, 1887.

PHOTOGRAPHIC EXHIBITION IN AUSTRALIA: AN INVITATION.

To the Editors.

GENTLEMEN,—Will you kindly allow me space to inform members of the many English Photographic Societies, that the Annual Exhibition of the Victorian Amateur Photographic Association will be held in Melbourne in the beginning of July next?

I am authorised to invite contributions from British Photographic Societies, the Committee guaranteeing the utmost care of all exhibits, either returning the same, or, if so desired, will exchange print for print for Australian pictures. Book and Parcels' Posts to the Australian Colonies now render transition inexpensive, easy, and with careful packing, quite safe.

I trust this opportunity of extending the right hand of photographic fellowship will not be allowed to pass without result, and that it may prove but the introduction to future courteous interchanges between the Societies of the Mother Country and those of the Colonies. All communications and consignments (which must leave by the last *May* mail at latest) should be addressed to the Hon. Secretary, Mr. J. H. Harvey, 83, Gore-street, Fitzroy, Melbourne, Australia. I shall be most happy to supply any further information.—I am, yours, &c.,

EDWARD W. PURTON, Custodian, Amateur Photographic

59, Rochester-road, Camden-road, N.W.

Association, Victoria.

PERKIN, SON, & RAYMENT wish us to call attention to a slight printers' error in their *Beginner's Guide to Photography*. In the Tables of Weights, Measures, &c., on page 63, twenty minims are given as being equivalent to one fluid drachm; this, of course, should read sixty minims equal to one fluid drachm.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

- J. L. Denny, Daventry.—Two portraits of Mrs. Sarah Harris.
 B. Dnckmantou, Gainsborough.—Four portraits of Dr. Bagshaw.
 James Brown, Dundee.—Two portraits of Rev. D. Macrae.
 G. W. Wilson & Co., Aberdeen.—Views of Roslyn Chapel, &c.

M. WHITING.—Received.

RECEIVED.—J. D. Cooper. In our next.

W. A. BRICE.—A private letter is being sent.

T. M.—The negative seems to be too thin. Give shorter exposure and develop longer.

THOS. K. FAIRLESS.—The moonlight effect is obtained by the agency of dyes, such as Judson's.

RECEIVED.—We have received samples of printing paper from several dealers or makers. Among others two samples of exceedingly quick printing paper from Marion & Co., on which we shall report next week.

A SUBSCRIBER.—The marks proceed from the silver not being uniform all over the paper. Some of the sensitising solution has apparently flowed over the paper a second in the form of streaks, or it may be across the back of the paper.

RUSSELL STEELE.—Either the A, B, or C lenses will answer. The B will be the more rapid in action, the A next, and the C the slowest. The last lens named in your list is less suitable than either of the other three for standing figures.

TYRO.—Yours is a decided case of halation. The way to avoid it is to employ plates with a thicker coating of emulsion, or to "tack" the plates by coating them with sienna mixed with water containing just sufficient dextrine to prevent the colour from rubbing off when dry.

RECEIVED.—Three steel portraits of Her Majesty the Queen, representing her at the ages respectively of eight, eighteen, and (presumably) twenty-eight, have been received from the publishers, Charles & Co., Salisbury-court, Fleet-street. These will find favour with many persons.

W. W. H.—The subscription for the JOURNAL posted weekly to Germany for a half year is 8s. 8d. The prints indicate taste in selecting the point of view, but the foliage in the picture of the house is much too dark. The trout-stream is pictorially and technically excellent.

L. BOURQUIN.—You do not say what the clothes are stained with. Different stains require different treatment. If the garments are very light in colour it is possible that they will have to be dyed of a darker shade, as chemical stains cannot always be removed without injury to the fabric.

F. B.—1. You will not require a license for your stamp unless it bears a crest.—2. If you have paid for a die to be engraved it should become your property. Perhaps you are, however, only charged a small sum for writing on the stone.—3. To obtain more gloss, use the gum water stronger. Messrs. Newman & Co., Soho-square, publish a work on colouring.

SQUARE.—We have referred to the article alluded to. It would take up a great deal of space to go fully into the matter, and it would not be of interest to our readers. The subject is only interesting to a very few who follow a particular branch of photography as a business, and they are well informed on the point already. Perhaps one or other of them will give you instruction for a consideration.

LOLO.—The spots or markings are due to want of care in the fixing. The prints have been allowed to stick together while in the fixing bath, and so set up a sulphuretted action, hence the yellow markings. The backs of the prints show evidence of having been carelessly handled with fingers contaminated with hyposulphite of soda. Greater care in the manipulations will avoid such markings in future.

G. FROST.—Very much will depend upon the aspect of the windows. One thickness of ruby and one of orange will probably be sufficient. But if it face the south another thickness of ruby may be required. The lenses named will answer, though they will of course be much slower than a portrait combination. The only houses we know for picture frames are those whose advertisements appear in the business pages of the JOURNAL and ALMANACS.

KUHN BROS.—We are not aware of any method by which the paper can be made as sensitive as you require except by gelatino-bromide emulsion. To avoid the gloss, the gelatine must be reduced to a minimum. Some of the paper prepared by the Eastman Company has very little gloss indeed, and is much used for finished work. If it were possible to obtain less gloss than this paper possesses the image would, no doubt, have a "sunken-in" and flat appearance.

C. ROWLAND writes: "Would you kindly explain the following in the next issue of your JOURNAL? A friend of mine took two interiors a little while ago of a chapel in the neighbourhood; he developed one the same evening; it was much over exposed, and, to use his own words, 'the image was on the plate before placing it in the developer.' I thought he must be mistaken. A few days after he came into my room with his plate box in his hand, and, not caring to develop the other of the two plates because it had had a longer exposure than the first, took it out to throw away, when, looking at it, he called me, and on the plate I distinctly saw the window of the chapel with the gas fittings which were between the window and camera. As we looked at it gradually faded away, and in less than three minutes was gone. If you can elucidate this (to me) mystery you will much oblige."—When a plate or part of a plate (in this case the window) is very much over exposed, it is not an unusual thing for the image to be faintly visible before development. The cause of its disappearance was that the action of the light on the film darkened it and so buried the faint image.

PARCHMENT.—1. For a license to print apply to the Office of Inland Revenue.

—2. We cannot offer any suggestion relative to the parchment.

FERROTYPE.—1. The silver may be precipitated as a chloride by adding solution of chloride of sodium.—2. An ordinary camera as described will answer for ferrotypes.—3. Such a studio as described will serve for taking groups.—4. *Trask's Practical Ferrotypes* is an American manual, which may be obtained from or through Atkinson, of Liverpool.—5. The quickest way by which to produce prints is that described in an article in ALMANAC for current year entitled *How an Order was quickly Executed*. [See page 229.]

C. M. B. asks: "Will the formula you give in the leading article of the last number of the JOURNAL for developing gelatine plates used for copying line subjects, together with preliminary soaking in a two-grain solution of gallic acid, suit equally a batch of plates which have been exposed to about double the correct time? If not, what course do you recommend me to pursue? The subjects are landscape and architectural."—The plan recommended will possibly answer quite well. If the plates have a tendency to frill with the potash developer then the ammonia may be substituted. If the plates are very much over exposed a still larger proportion of bromide must be used.

F. S. asks: "Can you help me out of the undermentioned difficulty? I have some copying to do, and I have tried by wet process, but the fogging by the carriers spoils everything. They have silver wire corners; one is new and the other is old, but both give the same result."—The trouble complained of is no doubt what is known as "oyster-shell markings." One of the principal causes of this evil is due to the collodion being of a horny and repellent character. The best plan for our correspondent to pursue will be to add some old and porous collodion to that he is now using, drain the plates very closely before placing them in the slides, and to see that they rest on strips of blotting-paper so as not to touch the woodwork of the carriers at all.

D. G. THOMSON, M.D., writing from the Camera Club, states a case (*opros*) of some remarks made by "Free Lance" in the JOURNAL for March 11. He says: "A lady went to Mr. Blank's studio in a suburb about this time last year and sat for cabinet portraits in several positions. Six were ordered and paid for, proofs were sent in due course, and so many copies ordered of each. Unknown to and without the permission of the sitter, a large direct negative was taken at the same time—I forget the size; I should think 16x12—and a letter sent subsequently to the effect that Mr. — had at the same time taken a large photograph, and submitting a print of it for sale at three guineas. Although admired as a picture by the lady and her friends, it was refused. Again without the permission or knowledge of the lady, it was sent to a certain photographic exhibition, and was awarded a medal for portraiture. The lady's friends wrote to Mr. — remonstrating with him for taking this liberty, and received an unsatisfactory and evasive answer, with a refusal even to make the *amende honorable* of sending the lady a copy of the picture. This should be exposed, namely, the dodge of taking a number of negatives, keeping the best one back, and submitting it later for sale, it having already been paid for as a sitting. He has furthermore annoyed the lady ever since by prominently exhibiting this portrait in his shop. No disagreeables would have arisen had Mr. — had the ordinary civility and courtesy to ask permission first. Mr. — cannot construe the fact that on the lady calling at his studio one day he informed her that her portrait was in the exhibition, and that he foisted two admission tickets on her acceptance, into permission asked and granted. Will you kindly inform me if by any means I can recover a copy of the sitting, which, as one of the rest, was duly paid for, and also if I can cause Mr. — to cease exhibiting the lady's portrait in his shop?"—In the foregoing we have for obvious reasons suppressed the name of the photographer, his residence, and the exhibition. We are sorry to have to say that this practice is not altogether unknown even with firms of recognised respectability. There is no denying that it is highly reprehensible, and cannot be too strongly condemned. Concerning the legal aspect of the case, we invite expressions of opinion.

CAMERA CLUB.—The subject for Thursday, April 28, is *A Photographic Tour to the Spanish Main*, with lantern illustrations, by Mr. Lyonel Clark.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, April 27, 1887, will be *Lantern Matters*. This is a lantern night. Visitors are invited.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next technical meeting of this Society will take place on Tuesday next, April 26, at the Gallery, 5A, Pall Mall East, when the subject of *Stripping Films* (with demonstrations) will be brought forward.

PHOTOGRAPHING THE STATE APARTMENTS AT WINDSOR.—During the past week Mr. William Brooks has been actively employed in taking negatives of the State Apartments, and so far as he has yet gone he has, we learn, been very successful. Mr. Brooks anticipates that they will make a fine lantern series.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1408. VOL. XXXIV.—APRIL 29, 1887.

RECORDING TIME AUDIBLY.

It is confessedly troublesome to impress the eye into the marking of brief periods of time, especially when that organ should be otherwise engaged. Those who have astronomical observations on hand require the ear as well as the eye to be on the alert.

It was probably some such feeling as this that prompted Mr. Lyonel Clark to devise an audible time marker of the simplest construction, yet most exact nature, which he exhibited last week at the Camera Club. It was only a pendulum and very little more; but that little was everything. Started into action by a push of the finger, a well-suspended pendulum, having a ball or bob of moderate weight, will go on oscillating for a long period, until brought to a stop by the operation of the law of gravity and the atmospheric resistance.

Mr. Clark's invention—if invention we may designate it—consists in supporting a half-second pendulum on a table stand, on which stand projects, at a right angle to the motion of the pendulum and a little below the pendulum ball, a slip of steel or other hard sonorous metal, which when touched by any passing body shall emit a sound partaking of the nature of a ring, or at any rate a well-developed clink.

Suspended to the lower end of the pendulum rod is a bit of string of, say, an inch in length, which sustains a bit of any hard metal. Alas! that we have to record it, but on this occasion it was only a brace button, which will answer quite well. This goes flipflap against the interposing strip of metal and records its transit quite audibly.

To beat seconds there must be a distance of forty inches (less a portion of an inch) between the point of suspension and the centre of the pendulum ball, which gives ten inches as the length of a pendulum rod that is required to indicate half seconds; and, as we have said, if the ball be of sufficient weight, when once it is started by a vigorous push it will continue vibrating for a long time, recording half seconds audibly with the greatest regularity. It is immaterial whether the oscillations of the pendulum be great or small, so long as the suspended button strikes against the projecting bar, for the vibrations are isochronal, the long and short ones being performed in equal time.

The appliance here described, simple though it be, will, we believe, conduce much to the comfort of those who are conducting experiments which involve time exposures in the laboratory, and Mr. Clark deserves thanks for bringing it forward.

THE INTENSIFICATION OF GELATINE NEGATIVES.
SINCE we wrote a fortnight ago on the subject of *Gelatine Plates for Copying Line Subjects*, we have had several proofs

that a satisfactory method of utilising rapid plates for the purpose is much needed; and though Mr. Bolas, in his discourse on photo-mechanical printing methods before the Camera Club on Thursday evening last week, made no allusion to the production of the negative, there is no gainsaying the fact that the operation presents difficulties to many.

So far as general practice is concerned, it is not found, as we stated in our article a fortnight since, that ordinary rapid gelatine plates lend themselves with any particular readiness to the purposes of black and white, or, indeed, other reproductions where extreme density is required, as for photo-mechanical purposes. The reason of this is chiefly that the modern plate is made for rapidity and softness of gradation rather than for vigour and contrast, and that without some special mode of treatment, such as that given in the article to which we refer, it is undoubtedly inferior to wet collodion. There are, it is true, many methods of intensification, but all, or most of them, appear to possess some objectionable features which render their employment unpopular.

Our own predilection has always been, as we have frequently stated in these columns, in favour of what is known as "silver intensification," that is, the employment of an acidified solution of pyrogallol to which a small quantity of silver nitrate is added. The results obtained by this method are, we think, beyond all doubt superior to those obtained by any other, and its only fault, if fault it really be, lies in the care which is necessary in order to avoid staining the negative. This stain is as easily preventable as any other kind of stain, and when the negative has been successfully intensified, the image, as we have proved by the test of seven or eight years, is reasonably, if not absolutely permanent, a distinct contrast to many other modes of intensification, which, if they do not lead to immediate discolouration, lay the seeds for subsequent and not very distant decay.

Consequently, on our predisposition in favour of silver intensification, we hailed with delight a novel method for which most favourable claims are made in the report of the Photographic Society of Philadelphia in another column, and lost no time in putting the process to a careful test, but with, we regret to say, an almost total want of success. In fact, we cannot help thinking that the plan as detailed in the report has got unfortunately muddled, for a more extraordinary want of agreement between results promised and obtained it would be difficult to find, while the conditions laid down are equally surprising.

In principle the method involves the substitution of gallic acid for pyro, and this is the feature which specially attracted us, though it is by no means new, M. Jastrzembki having

some years ago published a process specially adapted to gelatine plates in which gallic acid, acetic acid, and silver were employed, the silver solution being acidified previous to its mixture with the reducing agent. But in the method which comes to us from Philadelphia a different course is adopted, the negative itself being submitted to a preliminary acid bath previous to the application of the gallo-nitrate solution, which is used unrestrained. Now, as a consequence, the intensifier depends entirely upon the quantity of acid absorbed by the negative film for any restraining influence to prevent abnormal reduction. The solutions of silver and gallic acid, if mixed before application to the plate, become instantly discoloured and muddy, a condition which increases as the operation proceeds, and consequently tends greatly to staining the negative.

Further than this, the preliminary acid bath so far from reducing the chances of staining by contact of silver with unremoved hypo, actually increases the probability, since any hypo remaining on the film would be resolved into dangerous sulphur compounds more to be avoided than the hypo itself. There is, moreover, apparently some discrepancy in the respective quantities of the different acids mentioned in connection with the preliminary bath, for ten minims of even the strongest nitric acid can scarcely be accepted as a fair equivalent for *one ounce* of citric acid; nor can the latter, a definite crystalline substance, be compared weight for weight with such a variable and uncertain liquid as "acetic acid."

But perhaps the most serious objection to the preliminary bath consists in its other constituent—the chrome alum. The immersion of the plate in a solution of chrome alum of the strength of one ounce to the pint, or upwards of twenty grains to the ounce, exercises such a hardening effect upon the film that all chemical or intensifying action is practically arrested, and the only effect of even a most prolonged immersion is to *stain* the image, and so give it a fictitious appearance of greater density. The fixing operation, too, is so seriously prolonged from the same cause that despite the combined hardening effects of the chrome alum and the gallic acid, frilling can scarcely be prevented.

Even greater anomalies exist in the intensifying solution itself. Stock solution A we are told is composed of 120 grains of gallic acid dissolved in one ounce of alcohol, or, roughly, one part in four, and one drachm of this solution is to be used to each ounce of intensifier. But in the first place we do not find it possible to dissolve anything like the quantity named, and even when the alcohol is allowed to take up as much as it will a portion of it is precipitated when water is added. If the strength of solution were correctly stated then the dose of gallic acid—fifteen grains to each ounce of intensifier—is an unmistakably "stiff" one and one that will scarcely recommend this method on the score of economy. Add to this that the proportion of alcohol in the intensifier is so large—one drachm to the ounce—that the film partially rejects it, a circumstance that acts as a further arrest to chemical action as well as tending to inequality of action, for the solution runs off the plate in the same "greasy" manner that the silver bath does from a freshly dipped collodion plate.

Then, lastly, as we have pointed out, neither the gallic acid nor the silver solution contains any restraining acid, consequently, instantly they are mixed the silver commences to suffer reduction. The discolouration that ensues is not of the character that occurs when nitric, acetic, or citric acid is present and when the solution, though it darkens, remains per-

fectly clear for a considerable time. On the contrary, the result is a filthy mixture of a dirty black colour, that from the first leaves a dense sediment adhering to both developing dish and plate, and which is in itself sufficient to ruin any negative however good.

As the result of our experiments it will not surprise our readers, then, if we say that the method as given has proved an entire failure, though, be it said, we do not imply that gallic acid properly applied cannot be employed for the purpose, and perhaps with certain advantages over pyro. But the preliminary bath as at present recommended, and the absence of restrainer in the intensifying solution, entirely destroy any possible advantages derivable from the Philadelphia formula.

As an example of the working of that formula we may quote an actual experiment. A plate was cut in half and one portion treated with *six* successive portions of freshly mixed gallic acid and silver solutions during a period extending over nearly three hours, the solution being replaced when it seemed impossible for it to discolour any more. The final result was simply an alteration of the general colour of the negative arising from the staining of the film, and when printed from the two halves of the negative showed precisely the same amount of contrast, though the "intensified" portion took three times as long to print.

We may shortly return to the subject of gallic acid intensification, but at present we can scarcely recommend the adoption of the plan referred to.

BACKGROUNDS BY THE "POWDER PROCESS."

IN recent articles we have given the practical details for preparing backgrounds by two different methods, namely, in flatted oil and in distemper colour. We now propose to describe a third plan, which, for want of a better name, we shall designate the "powder" or "dusting-on" method—terms not altogether unknown in photography—inasmuch as the colour is applied to the canvas in a dry and powdery condition.

The principle of the method is this. The pigment, as a powder, is mixed with an adhesive material, also in the dry state, and then applied to a moist fabric and well incorporated with it. Hence, when finished, the colour becomes fixed. By this system a background may be produced which is equally as efficacious as by either of the previously described methods, while, at the same time, the plan possesses this advantage over them, namely, that graduated tints may be obtained without difficulty. It may be mentioned that backgrounds made by this process are not quite so durable as those in oil colours, but they are equal in durability to those in distemper, if, indeed, they are not much superior. The powder process has the further advantage over the flatted oil or other methods, that, in case of injury, the background can easily and quickly be repaired, very frequently without a fresh application of pigment.

Furthermore, the manipulations are so simple that the novice is scarcely likely to fail, even with his first attempt, which can hardly be said with reference to either distemper or flating. This process, though a very old one, does not appear to be very generally known. It was introduced first, we believe, by Mr. A. H. Wall more than a quarter of a century ago, and it has since then been vended, for a substantial fee, as a "secret process." Here is the method of procedure.

A piece of unbleached sheeting, such as that generally used for backgrounds, is strained on a wooden frame in the usual manner. Next the colour is prepared. The particular pigments

employed will, of course, depend upon the taste of the operator. Colours such as those used for distemper will answer quite well. Common whiting, lampblack, umber, Venetian red, are all good pigments for the purpose. Whatever colours are used it is essential that they be reduced to a state of fine powder, and then blended to the tint desired. When the right tint is obtained, a small quantity of dextrine is added and intimately mixed. The proportion of dextrine to be added cannot be definitely stated—for the same reason that the exact quantity of size required for distemper could not be given in a former article—so much is dependent upon the pigments employed. One or two experiments on a small scale will determine the matter, particularly as a wide margin is allowable. If too little dextrine be added the colour will rub off when the background is finished. An excess, however, within very wide limits, will be of little moment; therefore, it is better to err on the side of using too much than too little.

It is a good plan to prepare a large quantity of colour at a time, as it will keep indefinitely if preserved in a dry place. The advantage of doing this is, that if at any time a lighter or darker background be desired, all that is necessary will be to take some of the stock colour and add to it either some white or black according to the shade required. The colour is applied as follows:—

The frame, with the strained canvas upon it, is laid flat upon the floor. The fabric is then evenly wetted with water, not merely damped, but made thoroughly wet. The best plan of accomplishing this is to sprinkle it well with water from the fine rose of a garden watering pot. After the wetting, it is advisable to rear up the background for a time in order that the moisture may evenly diffuse itself in the fabric and also allow the excess of water, if any, to drain out. Next, the background is returned to its horizontal position, and the dry colour sifted over it from a fine sieve. When the surface is coated with a tolerably even layer of the pigment, it must be vigorously brushed into the canvas with a stiff brush, using a circular motion. The most convenient brush to employ for the purpose is an ordinary clothes brush with a handle. The great point to be attended to in this operation is to work the colour well into the canvas. The colour should be in the body of the fabrics, and not merely on the surface. When the colour has been well worked in, and the surface appears fairly even all over, the background is reared up and allowed to dry. It will then be finished. If by chance, when the background is dry, it appears uneven, the inequality arises from too little pigment being applied in the first instance. In this event the background must be rewetted, more colour sifted over, and the brushing-in repeated.

If a background with a graduated tint be desired, it is more easily produced by the powder process than by any other, all that is necessary in this case being to take some of the stock colour and make an addition to it of some more black, or white, according to requirement, then, by sifting on the different shades on such portions of the background as are required to be lighter or darker, and afterwards blending them in the brushing, the most perfect gradations may be secured. In all cases, in shading more particularly, it is essential that the brushing is done in a circular direction.

If a background, produced by this method, happens to get injured, say by abrasion or from water coming through the roof of the studio, the damage can be easily repaired. This is done as follows:—The background is placed on the floor

and evenly wetted as in the first instance. Then, after resting for a short time so that the colour and dextrine may become thoroughly moistened, the surface is gone over vigorously with the brush. After this treatment the background is reared up and allowed to dry, when it will be found restored to its original condition. In repairing an old background in this manner, the precaution should be taken that the whole of the adherent dust, if any, is removed before the water is applied.

We are pleased to put on record a brief note we have received from Mr. M. Carey Lea, who, writing from Ashbourne, Pennsylvania, U.S.A., says:—"Your correspondent, 'E. Y. E.,' who suffered from ophthalmia and 'nearly lost his eyesight,' should, if he returns to the practice of photography, be extremely careful of the sort of light he works by. This is far more likely to be the explanation than use of ammonia. Also should be careful about suddenly leaving the dark room and passing into a strong light. Two thicknesses of bright and deep yellow-green glass would suit for him, using gas behind them, not daylight."

SOME considerable portion of the correspondence columns of our contemporary the *English Mechanic* were recently devoted to the old question of the removal of silver stains from the hands. It is very singular that the one way of all others which succeeds the best should not be universally known, but it is yet true that the simple method of treating the stain, whether upon the hands or upon linen, with a solution of iodine, followed by a further treatment with solution of cyanide or of "hypo," even now is by no means commonly practised. It is true the hypo solution acts slowly, and that cyanide is objected to by many, but strong ammonia solution applied to the iodine-treated spot will almost instantly get rid of the brown stain, leaving in its place a slight greyish white, which would not be noticed; but it will not remove the silver stain as one writer states. Iodine, dissolved in water by the aid of iodide of potassium, is far cheaper and much better than "tincture of iodine."

THE old developing solutions, when used with silver solution, were the most fruitful causes of silver stains, but these were of a very different character from those brought about by contact with simple strong solutions of silver, such as that used for the printing bath, for instance. Once dried upon the hands these are by no means quickly removed.

STILL, nowadays, silver stains are so rare that they may be looked upon almost as things of the past; but, as every practical photographer is aware, pyro without silver brings stains of a very disagreeably persistent nature. They are, however, quickly removed by moistening the hands with a dilute solution of almost any acid—hydrochloric, nitric, oxalic, citric, &c. It must be observed, though, that after cleansing the hands in this manner they must be very freely washed in water, preferably hot, for if this precaution be not taken the stains will reappear under the use of soap and water.

THE long talked of Congress of Astronomers has become a reality, and the opening ceremony was a great success. The Congress, as our readers are aware, has been called together by the French Government to arrange a system for obtaining a photographic map of the heavens, and the plan has been greeted in the most enthusiastic manner by all eminent astronomers. The French Minister of Foreign Affairs addressed the gentlemen present at the opening ceremony, and spoke most strongly upon the importance of the subject. "You are," he said, "with a fruitful and cordial understanding about to arrange for the execution of a map of the sky whose exactitude will exceed not only everything hitherto achieved, but also everything one dared even to have dreamed of before the present day."

THE Congress soon set to work, Admiral Mouchez, Director of the Paris Observatory, being elected Honorary President, and Professor

O. von Struve, Acting President. A series of resolutions was passed, the first and last of which only we need quote. These were (1), "The progress realised in astronomical photography renders it absolutely necessary that the astronomers of the present century should undertake a conjoint photographic record of the heavens." (3 b), "To fix upon the best means to utilise at the present time the various data furnished by photographic processes."

With regard to processes of photography for this purpose, Admiral Mouchez in his late report gave some interesting data as to his experience with quick plates, and at the last meeting of the Royal Astronomical Society Mr. Gill, in his brief account of stellar work done at the Cape, made a very important announcement upon the subject. He had been using an English made plate of recognised great rapidity, but had been informed by Captain Abney that they could be replaced by plates of his invention which work eight times as rapidly. This is as great a gain upon the ordinary rapidity of dry plates as were dry plates upon wet collodion; it is therefore to be hoped that the new plates may be available for general work.

La Nature last week had a series of four excellent wood engravings from photographs of the moon taken by the Brothers Henry, and if they in any way resemble the original photographs they are a great advance upon previous work of the sort. Quick gelatine plates were used, and, although the moon photograph was of such size that if the whole surface were represented the map would be almost three-quarters of a yard across, the exposure given only reached a dozen seconds. The negative was taken with the aid of an eye-piece, as it was considered preferable to enlarge at the first operation rather than to first take a negative with the object glass alone and then enlarge it.

A NEW method of preparing gratings for light analysis was suggested by Mr. C. V. Boys at a recent meeting of the Physical Society. He found that some fine threads of spun glass and other substances he had made would, when placed side by side in the threads of fine screws, act like a diffraction grating and give banded spectra of white light. Mr. Boys's experimental results in the production of these fibres were most remarkable: he did not confine himself to glass, but tried melting and drawing out into these fine filaments quartz, sapphire, ruby, garnet, felspar, &c. With glass he was able to obtain fibres of less than the ten-thousandth of an inch thick; with quartz the marvellous fineness of less than the one-hundred-thousandth of an inch was attained, and these latter fibres were what he used for the diffraction grating. He obtained this exceedingly fine texture in his threads, not by the quick spinning of a wheel, but by melting the substances with an oxyhydrogen blowpipe, and then attaching a

portion to a straw arrow, which was then quickly shot out from a crossbow, leaving a trail of the delicate fibres behind.

PHOTOGRAPHIC INDUSTRIES.

THE PHOTOGRAPHIC FACTORY OF MESSRS. MARION & Co.

SITUATED in Chase Side, in the outskirts of the pretty northern suburban village of Southgate, is the new factory erected by Messrs. Marion & Co., of Soho-square, London, in which to carry on their various departments of a somewhat ramified business, so far as such departments embrace the preparation of sensitive plates, paper, and the many things which are cognate to these. The factory, although in full working operation and giving employment to numerous hands, can scarcely yet be said to have reached its ultimate state of completion, as at the time of our visit there were indications of its scope being in course of still further extension.

The location is a very delightful one, overlooking a rich valley which separates Chase Side from Winchmore Hill, a tract of country now becoming closely studded over with the villas of London men of business, who, cooped up in their offices during the day, find the hygienic counteraction in the pure air of these northern slopes.

When we say that the Marion factory has been designed by Mr. Alexander Cowan, who is the resident manager, our readers will readily comprehend that it is just as perfectly adapted for its peculiar requirements as it is possible for



such a place to be. Everything had been so carefully thought out and planned, every end having its means so well adapted for it, that when the administrative services of architect and builder had been completed there was not found anything of which the wish could have been expressed that it had been otherwise.

On the occasion of a visit to this elegant factory one day last week, after entering the grounds we were first ushered into Mr. Cowan's sanctum, which partakes in some degree of library, laboratory, and plate-testing room—a species of *tria juncta in uno* place—which, by the way, consists of more than one room. As might be anticipated, we have here, almost by the wave of an imaginary wizard's wand, either full daylight, total darkness, or a flood of non-actinic light, at option. There are drawers in which plates, either singly or in the open box, may be temporarily stored away for consecutive testing by lights in convenient proximity, yet which when closed are actuated by automatic lid closers, by which the contents are safe even should the drawer be opened in strong light. In close proximity is the testing light, consisting of a gas flame in a recess with a reflecting shield so arranged as to prevent any light being transmitted by the yellow paper window in front save what is reflected from the back of the recess. Stability of illumination is thus ensured combined with

perfect safety. But when an exposure is to be made the front screen is withdrawn and the reflecting mask so rotated as to allow the direct gaslight to stream into the apartment. The utility of this was demonstrated in actual practice in course of our visit while some plates were being tested.

The plates are coated by hand. The operators sit at the end of tables on which, by systems of endless bands, each plate when coated and laid down is quietly removed out of sight in front. Subsequent investigation showed that this table is about forty-five feet in length, and that by the time each plate emerges from a species of tunnel at the far end the emulsion has set and the plate is in a position to be transferred to a framed rack which, when loaded, is conveyed into the drying rooms above. At the time of our visit arrangements were in progress to increase the output of the plates by adding more coating tables to those mentioned. As there is ample space at command there need be no limit to the coating capabilities of the establishment.

Proceeding to the room above, in which the plates are dried and in which, owing to the darkness, we had to grope our way by feeling rather than by seeing, we were made aware of the admirable system adopted for securing an ascending current of filtered air. This is done by a series of bent porcelain pipes let in through the wall at short intervals apart. The current admitted by these, after being filtered to ensure the absence of all dust, ascends through the drying racks and passes out at the top of the roof through apertures securely trapped to prevent the ingress of light.

The motive force is derived from a two-horse power gas engine, which, in addition to supplying all the power otherwise required in connection with the manufacture of plates, also drives the dynamo, situated in close contiguity, which furnishes the electricity for the lighting. The electric lighting system is supplemented by a storage battery, which proves the "friend in need" on any occasion when the engine has ceased running for the night. This storage battery will act for eight hours after the stoppage of the engine.

We inquired as to the means employed for packing the sensitive plates, and were shown large rolls of tissue-paper which were undergoing a species of baking to ensure the last traces of moisture being thoroughly eliminated.

The coppers (of which there are three) in which the emulsion is made are formed of porcelain. They are of large dimensions, and are set in galvanised jackets, the mechanical arrangements being such as to enable a steady heat being maintained at any desirable temperature.

One part of the factory is relegated to the preparation of albumenised and ready sensitised paper. This is lighted through yellow windows, which permits everything to be plainly seen without subjecting the paper to any harm. The paper is sensitised sheet by sheet, and is then directly transferred to the preservative solution, on which it is floated for a definite period, and thereafter suspended by clips on racks until dry, when each is subjected to a calendering operation, previous to being sent to the packing room in which they are put up for the market.

In another room we witnessed the operation of duplicating negatives, both indirect and reversed position, according to the method of printing to which they were to be applied. Carbon printing, both on paper and on opals, was here also being carried on, on quite a manufacturing scale, for, as our readers are doubtless well aware, Marion & Co. supply prints as well as the materials by which photographs are made. A Jubilee portrait of the Queen was the subject that was engrossing the attention of all hands when we were there, and it was being printed in a variety of sizes and by a variety of processes, both on opal and paper.

The factory, taken either as a whole or in detail, is singularly complete and well adapted for the various operations that are carried on. System, order, and method prevail throughout.

We give a view of the premises on previous page.

VARIATIONS IN "STRIPPERS."

I FIND no difficulty in cordially endorsing what I see in the first article of THE BRITISH JOURNAL OF PHOTOGRAPHY of April 8 regarding "the stripping film," and it was to my great regret that I had to slip away from the chair (where I only landed by an over-

sight of my own) at the London and Provincial Photographic Association meeting, when Mr. Wollaston was demonstrating, in his able and happy way, the processes employed in producing a stripping film negative. But during even the too short time I was present at the said meeting I managed to swallow and partly digest two things: first, a beef-steak, which is of no consequence now; second, the fact that great minds do not often run in exactly similar grooves. The leading article referred to corroborates the latter conclusion, and the two combined—Mr. Wollaston's demonstration and the leading article—cause me to write a few notes I have made during my now fairly extensive practice with the stripping films made by the Eastman Company. I am not going to write a bellicose article, for I agree with all that is found in the "leader," and Mr. Wollaston is in this particular line far too big a man for a little fellow like me to flout.

It has at times come to my knowledge that when a process has been in its infancy, rules too hard and fast have frequently deterred people from trying that process, the reason being either want of convenience, or time, or pluck, on the part of the would-be beginner, or else the stubbornness that has characterised our race ever since the days of that Biblical gentleman who was quite willing to bathe in any river except the particular spa recommended to him. My endeavour shall be to give such Naamans a choice of watering-places, and they can go in with their clothes on if they like, for one of the points of this process is that you do not need to "strip" unless you like. If, on developing a negative, you do not altogether fancy it, there is no necessity to proceed any further with it; it will make, perhaps, an ordinary paper negative, oiled or unoled, as wished. Or the negative, preferably unoled, may be dried and a print taken from it so that the qualities may be judged, and this is a greater advantage than some may think. Though I have, as I hinted above, considerable experience in stripping films, I cannot always be certain what sort of result I have got until I take a proof, and as collodion and "skins" are not to be had gratis, I can recommend this precaution to beginners when at all in doubt as to whether they have got a medal negative or a fit subject for the fire. The negative must not be aluminated, but well washed and dried. If a satisfactory print be the result, the negative must be thoroughly wetted once more, and can then be squeezed and stripped as if we had never doubted its excellence.

Mr. Wollaston was pretty emphatic in his preference for soda development over ammonia. I have developed with soda, potash, the two mixed, ferrous oxalate, ammonia, hydrokinone and potash, and other developers, and I greatly prefer ammonia and pyro to all the others. This is an old story. I have always preferred ammonia to other developers. Probably the variation lies in the man and not in the chemicals. I mention this not in contradiction to Mr. Wollaston, but to show that at all events it is a matter on which there are two opinions. If the films could only be developed to perfection with one developer, that would be a stone to heave at the process. Mr. Wollaston has produced splendid negatives with his soda, so have I with ammonia. Mr. Wollaston loves his soda, while "my heart is true to Poll," that is, ammonia. My only reason at present for my preference is a general one. Not long ago I had a particular reason, namely, that I had an idea that ammonia was less likely to cause insolubility of the substratum than soda when mixed with the tanning pyrogallol. Briefly, then, I may affirm that any developer which works well with gelatino-bromide plates will work equally well with these films.

I now pass on to other alternatives open to us in the stripping processes. The plate that is to carry the film after development and before stripping may be variously treated. The commonest and simplest and speediest method is to tale and collodionise the plate. But at certain times—for reasons I have not yet exactly run to ground—the film at a later stage has left the plate before I was quite ready for it. This is an important point sometimes, as for instance when the film, *minus* the paper, is intended to remain a long time or for ever on its glass support. In this case the plate should not be rubbed with talc, but coated with a thin solution of pure indiarubber in benzole, also pure, and then coated with collodion. A compromise which I always make now is to *edge* the plate with rubber solution after the tale and before the collodion. This was suggested to me by my friend Mr. Jackson, of the Eastman Company, and I find it most valuable. The film never springs prematurely, though when required it always rises to the occasion. The collodion I have always used is Mawson's enamel, but it is better to thin it with ether and alcohol (four ounces of the solvents in equal parts to one pint of the plain collodion). I see it sometimes recommended to add a small quantity of castor oil; I have had enough of that very valuable medicine, which may make collodion "tough," but has rather a different effect on me!

Anyhow, I have never used "el. ric." in combination with collodion. This "talcum" and coating of glass plates might at times be inconvenient, but I find that the plates when coated with collodion, *if they are well washed* as soon as thoroughly set, may be dried off and stored away till required. I confess I was doubtful of this system until I tried it on a negative of no value which had itself been thoroughly dried. I made both the film negative and the collodionised plate thoroughly wet, squeezed them together, and had no trouble whatever in stripping off the paper in water at the same temperature as I use for the ordinary routine of stripping work. But, (1), the solvents must be entirely washed out of the collodion as soon as it sets; (2), the paper film must be completely wetted before squeezing, and if any part of it had ever been dry it must *all* have been equally dry. The possibility of coating a lot of plates at a time and keeping them till required is valuable for the many who can only get chance moments for their photographic work. I do not recommend the system; I only state its feasibility.

I am sometimes asked if there is any advantage in having the water for stripping very hot, say up to 200°. I do not think there is any advantage in such hot water, nor have I ever found any harm to arise from it. So long as the water is hot enough to separate the paper in about two minutes I am quite happy. One of the drawbacks to the old process, before the collodion was introduced into the "new," as I call it, was that the water required to be very hot indeed, sometimes unbearably so. Nowadays my water is not usually over 120° Fahr.

After the paper either floats off or has been carefully removed, the film ought to be rubbed all over under the tap with either a broad camel-hair brush or the pads of the fingers. I prefer the latter, for if there is any grit or foreign matter on the film I feel it and beware, or remove it accordingly. But it is important to rub it somehow, in order to clear away stained pieces of the substratum. The alum and acid bath which follows this washing produces one of the most delightful changes with which I am acquainted. The plate goes in a leper and comes out an Adonis. Pears's soap and Madame Rachel are fools compared with the alum (saturated) and H Cl (one ounce to about one gallon of alum solution).

Now I come to another variation in practice permissible with this process. The "skin," which as the leading article says is "composed of gelatine and glycerine," poured out upon a ground-glass surface, set, dried, and stripped, has two sides, one matt, the other smooth and shiny. If the matt surface is squeezed next the film its mattness disappears; therefore, when my negative is hard I put the matt surface next the film. If my negative is thin I do the contrary, I leave the matt outside, and it acts like ground-glass. And the finished negative can be made hard or horny, or limp and flexible, according to the amount of glycerine put in the water in which the skin is soaked. The glycerine in the skin will dialyse out if the soaking water has no glycerine in it; this, of course, will result in a horny negative film. And *per contra*, a large quantity of glycerine in the water, especially in hot weather, will cause the stripped film to be limp. Here again we have a power of choice in the character of our finished film.

The skin need not be attached to the film at all until it is desired. The film may be dried on its glass support, may be printed from, or worked upon, or copied before the skin is attached to it. This I have repeatedly done. But before putting on the skin the film must, as before, be thoroughly wetted, else mischief will occur. This is another feasible but not advisable proceeding. There is no fear of failure if proper care be taken to wet both film and skin, but I have known cases where proper precautions have *not* been taken, "*hinc ille lacrymæ*."

After the skin and the film are quite dry, we have another series of alternatives. We may cut round the negative and strip it at once, or we may seal it hermetically between layers of collodion by coating the skin with collodion, allowing to dry, and then stripping. This I do with all my good negatives. I hear that professional gentlemen are afraid of negatives in this state, but were I of the number of professionals I should prefer these negatives sealed from dust and damp, unbreakable, not bulky, light, and beautiful, to any sort of glass plates. However, "Every man to his own gout."

The skin may be varnished with an ordinary negative varnish if wished. But if heat is required for the varnish then the plate originally must have either a coat or an edging of indiarubber, as the heat will cause the film to spring almost to a certainty. But while I have been writing this I have stripped a film collodionised on one side and varnished on the other, and on former occasions I have, with cold crystal varnish, coated both sides of films. This latter operation, however, requires some dexterity, as the film, when loose, is apt to rise and curl on the application of the varnish even if cold. I should like to know of something more durable, less heavy and bulky, less destructible, in fact, more satisfactory than one of these films.

It is true that the Eastman Company hold patents covering the manufacture of these films. It is just as well that some firm should command the manufacture, for the preparation of the films is a matter of very great difficulty, and requires very accurate machinery. And the very fact of such care being necessary makes our work all the more easy and certain when we do get the tissue, which getting of the tissue is perhaps the most difficult part of the process at present. I heard, not long ago, that I was a partner in the Eastman Company (!); I only wish I were, for I should either get a sufficient supply of strippers sent out, or else fire casual rounds out of a six-shooter, expense no object.

ANDREW PRINGLE.

A DEMONSTRATION IN PHOTO-MICROGRAPHY.

[A Communication to the Camera Club.]

WHEN invited to give a short communication before this Club, I felt that there was little that I could communicate which would prove serviceable to its members, and I was, therefore, reluctant on that account to accept the invitation; but, if what I have been enabled under many difficulties to accomplish, may lead others to take up a most fascinating branch of the photographic art, my appearance before you will not be attended by any regret on my part, and may be the means of adding to the enjoyment of others.

Having devoted myself for a great many years to microscopical pursuits, I have always felt the desirability of being able to keep reliable records of the various pathological and other biological tissues, when their characteristics seemed worthy of preservation.

Drawing these by the camera lucida, although quite possible and preferred by many histologists, seemed to me to entail such an amount of labour where there was much minute detail to be included, that I have always felt that could the aid of photography be enlisted there would be not only a great saving of labour and time, but the reliability of a photograph would be unquestioned and unquestionable. With this view, I set myself to construct the roughly made apparatus you see before you. First it was very simple, merely a box placed on its side and carrying my lamp, my object stage, and a microscopic objective, which acting the part of the lens in a lantern projected an image of the object on to a dry plate; but as I worked it I found it wanted various refinements and modifications, so it has been undergoing a process of gradual evolution, and various parts added as necessity demanded better adaptations. I now believe that as far as the principles of its construction go, it is as efficient as any apparatus for the purpose of photo-micrography need be. Its advantages are, first, its comparative cheapness—it might be constructed by any one with the aid of a carpenter; secondly, it can give any sized photograph, from a lantern size to a 34 × 48 plate—I content myself with any plate up to a 7½ × 5; thirdly, it gives a field of view limited only by the size of the plate without the constricted circle produced by the microscope tube; fourthly, beyond its capabilities as a photo-micrographic camera, it can be used as a projection microscope, a magnified image being easily thrown and clearly seen on a four-foot screen. I need not take up the time of the meeting by any description of the apparatus, as it is before you, and you can see for yourselves, and detailed descriptions of it have appeared in the photographic journals; its method of employment I shall have the pleasure of showing you further on. I may only say that two useful additions have been made to it since the last description was published. The sliding baseboard, carrying the printing frame, and, which in using, holds the sensitive plate, is stopped every half foot by a bolt which passes into its side and keeps it fixed, an object of a known diameter, say, one-sixteenth of an inch, is projected on to the plate at each division—the measure of its magnified image gives the number of diameters it is amplified. This must be done for every objective employed, and a table constructed for reference. Such a table for the objectives I use is now before you.

There are difficulties attendant on the practice of the art, not arising from this apparatus, but from the nature of the subjects submitted to its action—I mean the character of the preparations to be photographed, and, perhaps, by pointing these out some remedy may be found through the aid of those who prepare objects. I presume there would be no objection to retaining such mounted subjects as are now prepared to view with a binocular microscope, where depth or thickness rather adds to than takes from the utility of a preparation, but where it is desired to obtain a photograph, the greatest thinness of a section compatible with keeping the structure together should be sought after; this in conjunction with a suitable stain would enable a good photograph full of detail to be obtained.

* The details of construction will be found on page 149 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1887.

The staining should be of an uniform tint, not stained with a selective stain, for however interesting it may be to the histologist to see the nuclei of a tissue brought out, it does not improve the appearance of a photograph to see it dotted all over with these spots; moreover, they mask the true histological detail, which is the more important element. The colours most favourable towards the attainment of a good result are worthy of consideration. Red staining by carmine is very suitable if not selective or too deep; a pale stain from a diluted solution of Bisumarek brown gives a satisfactory photograph; eosine stained preparations work fairly well, as do iodine green; but a pale blue or lavender makes the exposure so rapid that at present I have not succeeded well with preparations stained with them.

But whatever the colour of the preparation, it is absolutely necessary that it should be thin and mounted perfectly flat all over, or a decent looking photograph cannot be obtained. The proper time of exposure can only be ascertained from experiment. The light employed should be as uniform in quality and quantity as possible, and that from a paraffine lamp with a half-inch wick is ample if the edge of the wick is just slightly turned away from the object. The light may be intensified and made more actinic by putting a piece of camphor, the size of an ordinary walnut, into the reservoir containing the paraffine; this whitens the light and a perceptible difference is made in the exposure by its omission. Treating of the light brings me to the mention of the latest addition to my "bantling," as some one rudely called it. I found the light so superabundant that all the details of my preparations were flooded, therefore I devised an addition by which I can graduate the light to suit the details of the subject. I accomplish this by a tube fixed to the back of the object carrier, and in which a short piece of tube carrying a stop is moved backwards or forwards till the exact amount of light is obtained, and the effect of which I will show you presently. I hope I have said enough in this short communication to introduce the "bantling," and I will now proceed to show how I use it. My album of photo-micrographs on the table will, I flatter myself, sufficiently testify to the efficiency of the apparatus.

I have not brought any very difficult subjects to photograph, as I merely wished to show you the *modus operandi*, and difficult subjects take a long time to illuminate properly, but I have brought the tongue of the blowfly—a very fair test, a section of *Psamma arenaria*, and a section of Echinus spine, all of which give very satisfactory results, especially with a one-inch objective. T. CHARTERS WHITE.

PHOTOGRAPHY AND BOOK ILLUSTRATION.

[A Communication to the Glasgow Photographic Association.]

DOUBTLESS, when you saw that I was going to give a paper on *Photography and Book Illustration* this evening, you would think me a very rash individual indeed who would attempt in one single paper to go over all the ground that is implied in the title, "Photography and Book Illustration." No one can have a keener appreciation than myself of what is required to do justice to the subject chosen. I intend, however, to bring before you this evening only what has been done in one particular direction. I refer to the part the silver print has played in the illustrating of books. I say "has played" advisedly, for it is clear to demonstration, tested as it has been by actual experience, that the silver print, as far as book illustration is concerned, can have no future before it. Photography can and does still lend its helping hand, but in another way. It will be quite beyond my province this evening to trace what may be called its development in this direction. Nothing could be more interesting or more enticing than to show how collotype or lichtdruuk printing was introduced to supersede the beautiful but evanescent sun-printed image, to refer to the photo-mechanical processes of Woodbury, to speak of photo-engraving processes, or to discourse on the possibilities opened up by the employment of the comparatively recent sensitive papers, the bromide and the Alpha. In addition, we would have to consider the processes brought forward by various experimenters having for their object the production of a photographic block that can be used for purposes of illustration along with the letterpress, one printing operation sufficing for both. Clearly the consideration of all these expedients would entail much more time than is accorded at a single meeting. At some future time, provided it would interest the members, and other material not coming forward, I would be very glad indeed to take up this important and somewhat extended subject at the point where we will leave off to-night, treating the various branches of it in the order in which they appeared, and illustrating this or that particular process by actual specimens of the finished production, much in the same way as I purpose treating to-night this matter of the silver print and its relation to the illustrating of books.

I am not aware whether the particular phase of book collecting that is being brought under your notice this evening has to any extent been carried out by other book collectors. Interested in books and, as you are aware, interested in photography, what more natural than that a sort of bias should be displayed in getting together a collection bearing somewhat on the history of book illustration so far as it has been assisted by means of photography. Talbot, judging from some of his remarks to be found in his introduction to *The Pencil of Nature*, evidently thought that there was to be a great future for the sun-printed image in the way of illustrating books. Talbot was a man who evidently had the courage of his opinions, and as the result he published the two books, *Sun Pictures in Scotland* and *The Pencil of Nature*. As you recently had an opportunity of seeing my copy of the former work, I need not enter into detail regarding it. It, however, lies on the table for the inspection of any one interested. I have not yet been able to secure a copy of *The Pencil of Nature*, but I do not despair. I hope yet, some way or somehow, to become the happy possessor of the volume in question. We may take it, then, that the two works in question were the first in this or any other country to be sent forth to the world enriched with veritable photographs.

In 1846 the *Art Union Journal* published, as a supplement, a specimen of Talbot's calotype. These prints were produced from various negatives, so that we should find (were it at all likely the opportunity presented itself) that on comparing the different issues a considerable variety existed in the prints published. I have endeavoured to get a look at some of these early productions, but not a single public library in Glasgow possesses a copy of the *Art Journal* for the year 1846. My object in thus hunting up the matter, so to speak, will be apparent when I come to speak of the paper negatives, said to be Talbot's, which have been brought in to-night for purposes of exhibition. I was, and am, naturally anxious to identify the negatives, so that if I came across a print corresponding to any one of the negatives the assumption that all the negatives are Talbot's would be a reasonable one. This Talbotype which you see here, and which I have been informed represents a street view in the town of Frome, is in a volume of the *Art Journal* which belongs to our worthy member, Mr. Andrew Mactear, and we have to thank him for letting us have a look at this picture with its forty-one years of existence. I may mention that I saw recently another of these *Art Journal* Talbotypes. A Glasgow gentleman who possesses a complete set was good enough to let me have the volume for 1846; and the picture in his book for that year also represented a street scene, but it was very much smaller in size (about a quarter-plate) than Mr. Mactear's one. In addition to these I have been fortunate enough to secure this single number of the *Art Journal* containing the supplement. For a year or two back I had been on the outlook for either the volume or the number, and this very week I have succeeded in getting what I have been waiting for. The picture in the number now brought under your notice is totally different from those already indicated to you—it represents a scene on board some vessel. It is most unfortunate that we have no means of knowing what the original subject was.

I have been informed that in an early number of the *Glasgow Mechanics' Magazine* there is to be found one of these Talbotypes, also issued in supplemental form, but this I have never seen.

The first scientific journal in this country to be illustrated by means of the silver print was the *Quarterly Journal of Microscopical Science*. The print which you see here was published in 1853, and appeared in the April number of the *Journal* for that year. Although somewhat faded it is still in good preservation. The negative was taken by Mr. Delves to illustrate a paper by Mr. Shadbolt, a former Editor of *THE BRITISH JOURNAL OF PHOTOGRAPHY*, and the subjects represented are the spiracles and tracheae of silkworm and proboscis of fly.

Let me now call your attention to this small volume here, known technically as a 12mo. It is an edition of Virgil's complete works. Our interest in it lies in the fact that the work has been profusely illustrated with small silver prints. These we find forming head-pieces to the various books of the *Aeneid*, &c. Judging from the appearance of the prints I would be induced to say that they had been sulphur toned in the first instance. The pictures themselves are from studies of the antique. I understand that the publishers of this volume, Firmin-Didot of Paris, also published an edition of Horace's works illustrated in the same way as the Virgil now before you. These volumes were, at their date of issue, somewhat high priced. I regret I have not the Horace to show you, nor have I seen it. The date of publication of the Virgil is 1858.

The large volume here should have a special interest to the members of the Glasgow Photographic Association. It is a work published by Collins of this town, and is entitled *Palestine in 1860*. The letterpress is by the late Rev. Dr. Buchanan, and the views shown,

twenty-four in number, were taken by a quondam member of this Association, Mr. John Cramb. The prints are all in excellent preservation, testifying to the original good character of the work produced. I have not much information regarding the negatives from which these prints have been produced further than that they were taken on plates prepared by the albumen process.

Mr. Cramb contributed a series of articles to THE BRITISH JOURNAL OF PHOTOGRAPHY detailing his experiences while sojourning in the Holy Land. The articles in question commenced in the number of the JOURNAL for December 1, 1860, and were continued at intervals during the various months of 1861. To the past generation of photographers Frith's photographs were well known. I have here a copy of a work embellished with Frith's handiwork, and it, like Cramb's, presents to us the leading characteristics of the Fatherland of the Jews. The publication of this book, which has for its title, *Sinai and Palestine*, is also due to the enterprise of a Glasgow firm, namely, Wm. Mackenzie. The photographs were taken in the year 1857, thirty years ago, so that in point of time they are three years older than those of Cramb's. Judging from their appearance I would say the prints produced by Frith had been more heavily toned with gold than Cramb's pictures had been, and the preservation which has attended them is without doubt due to this circumstance. The photographs are thirty-seven in number, and, apart from the interest of the places shown, are in themselves highly artistic.

Passing from these, let me call your attention to this volume, which should have an especial interest to us. To the members of any Glasgow Society the name of Hugh Macdonald possesses a certain charm. I presume that there is no one here unacquainted with this author's *Rambles Round Glasgow*, and *Days at the Coast*; should, however, there be such an one, and he a Glasgow man, let him hasten to remove the reproach by procuring the works in question, and I am sure he will not be disappointed when he comes to peruse their contents. I was quite unaware, till recently, that editions of Macdonald's works had been published with photographs of the places referred to, and I regret I am as yet only able to show one of the works, namely, *Days at the Coast*. The book was issued by Andrew Duthie, of Gordon-street. Throughout the book will be found twelve photographs, the work of Mr. T. Annan. There is no date of publication attached, but I am in a position to fix the date as about the year 1868. This work here, entitled *The Old College*, being the Glasgow University album for 1869, next claims our attention. You will find therein two photographs, one of the old entrance to the College when it had its home in the High-street, the other giving a representation of the present edifice as it appeared in the year 1869, surrounded with scaffolding, and, as you will see, before the main central tower had begun to show itself. This print is, undoubtedly, a silver production; I am not so sure of the other one. I leave it to some of the members to say whether or not it is, as I think it is, a Woodbury-type. In connection with this matter of the illustrating of books by means of the silver print, there is one firm in Glasgow that has done a good deal in this way—I refer to Messrs. Annan—and through their kindness I am enabled to bring before you several volumes which as yet do not form part of my own collection. Messrs. Maclehose, several years ago (1870) published a work entitled *Old Country Houses of the Old Glasgow Gentry*, and this is the book in question. The first edition differs from the second in this, and that is what concerns us most, that the photographs were all silver prints in the former, and in the latter recourse was had to carbon. It is a book that has gone up very much in price—published originally at five guineas, the price now asked by the publishers is ten guineas.

Messrs. Annan have also reproduced in book form the works of Sir George Harvey and Sir Henry Raeburn.

Here are the works referred to.

Many of our members may remember a loan collection of pictures that was held in the Corporation Galleries in 1869. An interesting memento of the more prominent pictures then exhibited will be found in the thick volume lying on the table; it is the catalogue of the complete collection interspersed throughout with silver prints.

Here is yet another book to which the Messrs. Annan have contributed the illustrations, entitled, *A History of the County of Bute*. The work is by Mr. John Eaton Reid; a son, I understand, of Senex Murray was the publisher, and we find throughout the work nine photographs of the principal places of interest on the island. The date of publication is 1864. Curiously enough, I have just been informed by Messrs. Annan that so recently as 1885 they prepared silver prints to illustrate a book published by Paterson of Edinburgh, *Castles and Mansions of Ayrshire*, and prints to the number of seventy are to be found in this work. I think this must be a case of the exception proving the rule when we stated that the silver print had no future before it in the way of book illustration. Very many other

works have been illustrated by Annan, but, as they have been done by carbon, we pass them over on this occasion. It is but fair to state, with reference to the illustrations in the last-named work, that it was solely at the publishers' desire the silver prints were inserted. Messrs. Annan would have preferred either carbon or photogravure.

Wilson's *Photographs of Scotch Scenery* are known to all of us. Could more appropriate illustrations be found for a work such as Scott's *Lady of the Lake*? This edition of Scott's famous poem contains eleven photographs by Wilson of the more picturesque spots now made famous by the master-hand of our great Wizard of the North. The edition we are considering was published by Messrs. A. & G. Black, of Edinburgh, in 1869. It is bound in a somewhat unusual manner; the boards are either of wood or *papier maché*, I am not sure which, and the whole has been covered with, I think, a coloured paper representative of tartan, and which has received a coat or two of varnish. In addition two photographs have been laid down on the covers, one representing Sir Walter himself, the other his monument in Princes-street, Edinburgh; these also have received their protecting covering of varnish. The freshness of these two outside pictures is remarkable when compared with the prints in the body of the work; in fact they show less symptoms of decay, and that notwithstanding the fact that they have been exposed to light and friction for a period of close on twenty years.

This book on *Staffa and Iona*, published by A. Marion, Son, & Co., London, in 1867, contains twelve photographs all emanating from the studio of George Wilson, Aberdeen.

In this work, entitled *The Great Works of Raphael*, and published by Bell & Daldy, London, in 1867, there will be found twenty silver prints. It is to be noted that the negatives in the first instance have been taken not from the original oil paintings by Raphael, but from what have been regarded as the best engravings of these masterpieces. In this other volume, also published by Bell & Daldy, the same course has been followed, the engravings of the artist's works have been photographed and not the actual pictures themselves. Of course we are dealing with a period when the isochromatic plate was unthought of, or, perhaps, if not unthought of, at all events it was not *un fait accompli*. The artist's works herein represented are those of Sir Edwin Landseer and the book contains sixteen photographs of his early works. The year of publication is 1869.

Here is another edition of *The Lady of the Lake*, one published by A. W. Bennett, London, in 1863. A companion volume published by Bennett will engage our attention a little further on. The photographs illustrating the book are fourteen in number, and with the exception of the frontispiece, by Wilson, of Aberdeen, are all by T. Ogle. Many of the views are very fine, having been taken from points of view not generally selected. Bennett seems to have been a publisher who believed in employing photography as a means of rendering his books attractive. This work, *A Walking Tour in Brittany*, by I. M. Jephson, was sold along with a set of photographs (stereoscopic views) illustrative of places visited, and there is embodied in the work a series of photographic notes by Lovell Reeve, I presume the naturalist of that name. I have not these views, but there is as frontispiece a photographic representation of a street view of some town in Brittany; date of publications, 1866.

Here is a volume published in 1862. It is an edition of William and Mary Howitt's *Ruined Abbeys and Castles of Great Britain*, having throughout the work a series of some twenty-seven photographs of a somewhat small size. The prints have had spaces left for them in the letterpress, and have been affixed, I presume, after the binding of the book had been completed. The photographs are all in very excellent preservation; they are by various contributors, Bedford, Sedgfield, Wilson, Fenton, and others. The publisher of this edition is A. W. Bennett, London. I would beg to call your attention to the condition of two photographs that have been put on the outside covers of the book, much in the same way as those outside pictures already referred to in the edition of Scott's *Lady of the Lake*, only with this difference, there evidently has been no protecting varnish. While those on the outside of Scott's volume have suffered little or no change, those on the present volume are almost wholly obliterated. There would appear, therefore, to be something in the use of a varnish after all to protect a photograph. Take, for instance, the case of those photographs that are laid down on the wooden articles that come from Mauchline; they stand for years and no signs of fading will be appreciable.

A recently published volume, with silver prints for illustrations, is the one which I have here, and which hails from America; its title, *A Trip to Mexico*, and the author, H. C. Becher. As the date of issue was 1880, we would scarcely expect to find symptoms of degradation already. It contains six photographs, and the publishers are Willing & Williamson, of Toronto.

This, gentlemen, completes the list of the books illustrated by means of the silver print which I have brought here for your inspection this evening. While I cannot claim that the collection I have so far got together represents anything like the actual number of books that have from time to time been issued with photographic illustrations, still I have managed to secure a few things that perhaps may be well reckoned unique. It will be readily understood that books of the class I have been this evening considering are only obtainable now and then, at auction sales or second-hand book shops. A good deal of time is therefore required for the necessary hunting up of the material, and, after all, very often the thing sought for is not obtained.

WILLIAM LANG, JUN., F.C.S.

SULPHURATION OF PRINTS.

PERMANENT SENSITISED PAPER.

To judge from what one sees in our journals of late, one would think that the days of albumenised paper are over, and that the only question remaining to be decided is, Which of the new processes that are in turn being lauded up to the skies is to be the printing process of the future?

I know many of my photographic friends do not consider me to be conservative in my photographic ideas as a rule, but somehow I cannot help thinking that our old friend albumenised paper will live to see daylight through our negatives for many a year yet, even though many negatives may be poor, thin, yellow ones which do not give him a fair chance to show what even he is capable of in regard to permanence.

I would advise an amateur who thinks any child can do the printing, and who puts his printing frames out until the high lights on the paper are just beginning to tint, and then thinks all has been done that can be, to use the modern processes, as the results will last longer.

But it is the experienced printer and amateurs with artistic taste who soon find out how impossible it is to get equal results with these blind processes that they can with the old printing out ones. I have just been looking through a number of prints done by one of the most experienced workers in England in one of these development processes, and I feel convinced that there is hardly one of those prints in which he would not have deepened a shadow or slightly tinted a too obtrusive high light, could he only have seen and had the power of doing just sufficient and no more.

Platinotype, for instance, does capitally for representation of bas-reliefs and such like, and even for portraits when there is an experienced operator who knows how to build up a picture round the figure with the aid of suitable background and accessories. But with landscape work we very, very seldom come across a negative perfect in its balance of light and shade, and which does not require a little dodging to make a picture of it.

Let me be understood. If I came across one of these very rare specimens of a negative, I would most certainly print it in one of the more permanent processes; but from the negatives which I, for one, produce, in nine-tenths of them there would be some point which would be an eyesore every time I looked at it, so until we obtain a *printing out* process of more permanence, I intend to keep to our old friend albumenised paper for general work.

These are the reasons for my experiments to endeavour to discover the probable comparative permanence of ready sensitised paper with that freshly sensitised. For my tests I obtained a few prints on freshly sensitised paper from a gentleman who is acknowledged to be an authority on everything connected with silver printing. I might add that they were printed on Trapp's albumenised paper.

The permanent sensitised paper prints I produced myself on a paper in the market which is as good as any I have tried. Further, I was aware of a few particulars as to its production; that is, I knew that chloride of ammonium was the salt and citric acid the preservative used. I first obtained from the maker of my sensitised paper a sheet of the paper before it was albumenised, because I wanted to find out, as it was a very pure white, whether it contained any sulphides (such as ultramarine, sometimes used to disguise a slight yellow tint) which might have a bearing on the result. I tried the acetate of lead test, and could find no trace of any sulphide. I then selected my prints on the permanent sensitised paper, toned to as nearly as possible the same colour, and printed to the same depth, as the prints on fresh sensitised paper I intended to test them against. I also added a number of other prints, printed from thin and dense negatives and toned to different tints. Also pieces of albumenised paper (both fresh and permanent sensitised) which had not been exposed to daylight, but which had been passed through the toning and fixing baths with the prints; and, lastly, I added a piece of the plain paper before albumenising.

My first test was to see how these prints, &c., would stand against a prolonged exposure to a sulphuretted atmosphere. I did not consider it would be hardly fair to test the action of a solution of sulphuretted hydrogen upon them, as the conditions would not be similar to prints exposed to an ordinary atmosphere contaminated with only minute traces of the gas.

I therefore took a large glass bottle, to the cork of which I suspended a piece of sponge full of water, the prints, &c., were put in, and the cork sealed, through which passed a glass tube from a bottle containing sulphide of iron and dilute sulphuric acid.

At the end of a week I examined the prints, which showed the following results.

The paper which had not been albumenised was unchanged in colour, showing there could be no discolouration due to anything in the paper. The sensitised papers of both kinds not exposed to daylight, but which had been passed through the toning and fixing baths and thoroughly washed, had yellowed considerably, and as near as I can see, equally, showing that albumenised papers which have had free nitrate of silver in them are acted upon irrespective of the action of sulphuretted hydrogen upon the silver image reduced by light. The importance of this point will be seen better when I come to the question of the bromide papers.

In the comparative prints of equal tone and depth of printing, the half tones and shadows were faded nearly equally, some of the fresh albumenised paper prints, if anything, getting the best of it.

I was rather struck with one point, however, and that was that in both cases prints toned to a purple tone seemed to have yellowed more in the lights and half tones than the prints of rather warmer colour, which almost seems to show that, beyond a certain point in toning, the gold produces an injurious action upon the prints. Indeed, I was surprised to see how well prints from good bright negatives stood when only toned to a very warm tone, or even of a so called foxy tone, compared with prints of a purplish black colour.

The appearance of the whole of the prints pointed to one important fact, and that was that the character of the negative is of far greater importance as regards permanence than the colour given by the toning to the print; and I am very much afraid that prints from average negatives produced on the rapid dry plates at the present time will stand a poor chance of permanence when compared to prints from the old wet plate negatives with their clear glass and dense image.

Even the shadows in the prints from fairly bright negatives, which seemed to the eye to be as dark as in the prints from the more dense negatives, the sulphuretted hydrogen soon showed the difference, as far as the destruction of the image was concerned.

As for the prints from the thin negatives, they were destroyed to such an extent that I would seriously advise all photographers who print on albumenised paper, in every case where it is possible, to eschew the rapid plates giving these thin images; indeed, with some makes of even slow plates in the market it seems almost impossible to get a dense image with anything approaching clear glass on the same negative.

The density of an image does not depend upon the amount of silver in the film, but on the way the emulsion is prepared. The densest and best negatives I have ever produced have been with only six grains of silver nitrate to an ounce of emulsion, and the thinnest with over twenty grains, so that if one *cannot* get dense negatives on properly exposed plates with a certain brand of plates I feel convinced that the fault is in their manufacture. Of course I am now referring to thin negatives due to errors in development.

HERBERT S. STARNES.

CONTINENTAL PHOTOGRAPHY.

DILATING OR SHRINKING GELATINE FILMS.

M. LECORNEY has experimented upon stripping gelatine emulsion films, and enlarging or diminishing them to a required size; he used commercial plates, which do not all give the same results. The plates of M. Bernaert after being developed with ferrous oxalate, and again wetted with the developer, will part with their films when the plates are held at an angle and the films pushed with the finger, but if they be at all washed first this is not possible. When well expanded after the separation, they can be alumed and fixed in the ordinary way. With the plates of M. Lumière, also those of M. Bacard, other means must be adopted. After their removal from the iron bath they should either not be washed or be but very slightly washed, for it is necessary that a little iron salt should remain in the film; then they must be dried in the dark. Once dry, it is but necessary to plunge the plates of M. Lumière into water, and the films

will come off of themselves. With the plates of M. Bacard it is necessary to make gentle use of the finger after the washing. As in this case the film sometimes folds over itself, it is good to cover it in advance with some neutral powder which will prevent adherence of the folded parts.

It is possible, as is well known, to deal with all makes of plates by means of a strong bath of alum to which citric acid has been added, but the operation is rendered much more easy if the film be allowed to dry before using the alum bath. When the separated films are much dilated, they become so thin that it is difficult to manipulate them. M. Lecorney overcomes this difficulty by covering them with a solution of plain gelatine, after which they are dried, then submitted to the treatment already described. The acid bath dilates the film; it can be shrunk with an alkaline bath, and thus it is easy to get any desired dimensions.

Lastly, M. Lecorney calls attention to a curious fact. It is known that sulphocyanide of potassium dissolves gelatine freely, so he thought that the addition of a little of the sulphocyanide to water, acidulated with sulphuric acid, would favour the expansion of the film, but to his great surprise he found that it produced the contrary effect—the image contracted in such a fashion that it was reduced to but a third of its original dimensions. Simple washing undid the action of the sulphocyanide. Here then is a new field for experiment.—*Bulletin de la Société Française de Photographie.*

SILVERING GLASS.*

M. H. Bory states that the glass to be silvered should be carefully cleaned, then levelled horizontally in a situation in which it is kept heated to a temperature of from 25° C. to 30° C. If the temperature is lower the metal will precipitate but slowly, the deposit will be incomplete, and the silvering bad.

Solution A.

Distilled water 1 litre.
Rochelle salt (tartrate of potash and soda) 10 grammes.

Put the Rochelle salt in a porcelain evaporating basin with about 250 c.c. of the water, and add to it about 0.5 gramme of nitrate of silver. Heat it to nearly boiling point, by which time all should be dissolved. Add the rest of the water, pour the whole into a beaker, and filter.

Solution B.

Fused nitrate of silver 5 grammes.
Pure ammonia 3 „
Distilled water 1 litre.

Add the nitrate of silver to the ammonia, stirring until almost complete solution has been effected, then add the water and filter. At the moment when required for use, mix sufficient of equal parts of the two solutions by pouring them backwards and forwards from two vessels, after which pour a little of the mixture upon the glass, and distribute it evenly over its surface by means of a piece of chamois leather. Immediately afterwards pour on the rest of the mixture so that it shall well cover the glass without spilling over its sides.

After the lapse of thirty or forty minutes at the most, the silver is precipitated in the metallic state and adheres firmly to the glass; the liquid is then poured off, the deposited surface is gently sponged, rinsed with a little water, the glass placed on end to drain, and when it is dry the back is painted over with varnish or other preservative coating.

To avoid spots and an uneven coating it is indispensable to use absolutely pure distilled water. The argentiferous waste solutions should be saved and the silver in them recovered. When a thicker silvered surface is desired the foregoing operation can be repeated upon the same piece of glass. The vessels used in these operations should always be washed with distilled water.—*Bulletin de la Société Française.*

THE DEATH OF LÉONCE ROMMELAERE.

Sad news reached us a few days ago of the premature death of M. Léonce Rommelaere, Director of the Industrial School of Brussels, and first General Secretary of the Belgian Photographic Association. Letters making known this much-to-be-regretted loss to photographic science have been addressed to all the *savans* of photography and to the photographic Press by the thoughtfulness and in the name of the Belgian Photographic Association, which bears testimony to the great skill and devotion of our lamented brother. We feel strongly the regrets which inspire our colleagues in Belgium at the death of so distinguished a man, who was of an age which should have enabled him had he lived to render numerous other good services to our science.—*Le Moniteur de la Photographie.*

* This is much the same process as that described in these pages about twenty years ago by Mr. Carey Lea, but M. Bory gives in addition minute details for avoiding uneven deposit and spots, which are the chief difficulties in silvering glass.—TRANSLATOR.

WHERE I WENT WITH THE CAMERA.

No. IV.—RHEDEN AND SCHERPENHOFF.

On the road to Rheden the avenues of beech-trees that stretch along the highway for miles and miles are delightfully imposing. Trees planted close together, straight as arrows, tall as spires, majestic as the pillars of a temple, grow up on either side of the carriage-way as far as the eye can reach; then a footpath on either side with another row of trees running along the outside of each of these, make four rows of trees in all. To reserve the footpaths for pedestrians only, trees are planted at intervals in the centre of the walking-way, so that neither horse nor vehicle of any kind can get along.

A great boon to the traveller these limitless arches of green must be—a shelter in stormy weather from the violence of the wind and the rain, a cool shade in the summer from the heat and glare of the burning sun. When walking through these avenues I came across many knots of children sweeping up the *débris* on the ground around the trees and filling bags with it. On investigating the matter, I found that it was the beech nuts that had dropped from the trees they were sweeping up. The little people were out making their harvest, for they took the bags when full and sold them to traders, who paid them so much a bag for them.

When in this district I stayed at Scherpenhoff, a family mansion-house on the borders of the Ysel; it was built in 1699, and time has not traced a furrow on its front. It lies embedded in the midst of interesting scenery close to a river, surrounded by trees, and inhabited by most genial and loving friends. I sid, here let me strike my tent and rest awhile; which I did. I reached Scherpenhoff after dark; out of the night and the shadow of the trees my conveyance drew up at the hall door, which, standing open, threw a cheery light across the path, the lamps within playing upon smiling faces that beamed the welcome that merry voices in full chorus greeted me with as I entered. Beyond, the dining-room door stood open and inviting, table spread with snowy cloth and all things ready. A cheering sight for a hungry guest.

I was rather partial to the general fare in Holland. Many of the dishes were quite new to me, and highly enjoyable. I liked the times at which the meals were served. In some parts I believe these vary, but where I visited we got in the morning coffee and some light eating. The black bread one has heard so much about was served at this meal in thin wafer slices, daintily cut, and placed upon the white bread and butter, a sort of luxury rather than common food, talked of as to be looked upon with suspicion. We breakfasted from half-past twelve to one o'clock, solid meals served much as a good lunch would be at home. Dinner at six o'clock. Everything is served in separate courses. Between the soups, meats, and *entrées*, vegetables were served as separate courses, tastefully cooked, seasoned, and sauced, and very delicious many of them were—endive, cabbage, celery, &c. I also like the leisure and quiet comfort with which everything was done. After fruit you enjoy your cigar, whilst the lady of the house has a brazier introduced. This is like a metal pail, filled with hot embers, on which a bright, steaming little kettle goes on singing its song (Watts's hymn I suppose you would call it). From this apparatus, which is placed by the hostess's side, tea is made and served out as long as you like to sit and drink it, that same time in many cases being pretty considerable, as we sat and talked and played cards and drank tea. The ladies turned to their fancy work, and their jokes were cracked, gossip talked, and little plans arranged, all under the influence of tea.

I was at Scherpenhoff taken in charge by two young ladies, aged respectively thirteen and fifteen, who trotted me all over the place and made me photograph anything and everything we came across. Then I had to develop a plate or two to show them how it was done and what they were like. Next a print or two were demanded. You know what despots children are, and how insatiable is their thirst for knowledge. To show how the negatives would turn out in the way of printing, I had to go back to Arnheim to beg a piece of sensitised paper from a photographer there. Then, having no toning solution, I fixed them in hypo and washed them. Only people living away from the busy haunts of men can have any idea of how those girls treasured the yellow looking impressions I made; they seemed to look upon them as art treasures. Nina and Nellie were my little friends' names. Nellie wanted the mule done, and Nina would bring the retriever; Nellie would propose the fowls, and Nina would pose the pug, &c. So we had a lively time of it for a day or two, I can tell you.

The old house and its surroundings were picturesque and interesting, and I got some good pictures of them. It looked the ghost-story sort of place, quiet and secluded. None of the villagers would come near it after dark. They had seen something, of course; very likely the man going to the stable with a lighted lantern at midnight, or a reflection thrown upon the trees from a stained-glass window, or some other such weird spectacle. No matter, they had seen it, and they would not come near the place at night.

I visited and photographed most of the castles in the immediate neighbourhood. Every man's house is his castle here. Of special note was the Castle of Rosendall, the grounds of which were very beautiful, but I found the mansion-house itself more peculiar than pretty. New gables joined to a keep hundreds of years old, all rising out of the water (with which it was surrounded), was barren of pictorial effect from any point of view. But the Count van Palland, the proprietor, certainly

makes up in his grounds for the lack of beauty in his house, for they were a perfectly charming combination of wood, rivulet, and lake, and the Count is not above giving the visitor to his domain a little pleasure, or pain, as the case might be. He has a swinging bridge fitted across a small stream, that if you venture on you must rush across from the one end to the other, for if you hesitate in the least you are lost, that is to say, you will fall on your nose in the middle of it. I saw them do it—"both ways." I did not try it myself. If I had broken my nose it would have been awkward. In another part of the grounds, where the view of the castle is supposed to be finest, there is concealed a pipe and tap. The initiated, whilst you are absorbed by the view, turn on the tap, when a thousand hidden jets in the ground all around send forth a volume of water which is somewhat astonishing and very wetting. It depends on the humour one is in whether it be pleasant or not. But they didn't have me.

Middachten was another castle I visited. It belongs to the Bentinck family. It also is surrounded by water, but it is a very old house and more picturesque, a better subject for photography than Rosendall. The miles on miles of beech avenues that surround it on all sides is in itself a wonder well worth going a long way to see.

I spent a day in the village of Rheden amongst the white-haired, egl-footed, ponderous moving children, who can smile and laugh and tumble about withal, but their very playfulness seeming the business of effort. Under those pates of bleached, tufty hair, and behind those soft, sleepy-looking blue eyes, where lie hid the embers of future manhood and womanhood, who can say what fires of daring and doing may not be smouldering? For has not this little country of about one hundred miles long by fifty wide produced in its time genius, heroism, and courage, out of all proportion to its size, with its Rembrandt and Hobbema, its Van Tromp and De Ruyter? And what has been may come again. But surely their progress must be a solid, slow walk to success if movement means anything. They could never rush to glory.

All around this district the great and placid amusement of the peasant on the Sunday was fishing. Over the land could be seen the tillers of the soil—with their long fishing-rods across their shoulders)—making for some quiet pool by which to spend their leisure hours, the still silence being only broken by the distant tinkling of the Sabbath bell calling the more devout to church, but causing no expression of regret to flit across the pleasure-seekers' face.

One could not but be amused by the style of the direction posts on the roadsides; they do not give the distance in miles as we do, but the instructions are conveyed in time, thus:—Staig, half hour; Velp, two hours; and so on. I believe that an hour represents three miles. The carts, drawn by dogs, are also a special feature of the country, all sorts and conditions of dogs working steadily for their daily bread. You find them trotting along harnessed to carts of every kind. It brought to mind vividly Charles Dickens's description of the dogs that kept men; for the dogs here seem, pretty well, to keep a lot of fellows.

My girl friends had got a little cart made for their pug dog, just to give him some idea of what the poor working dog had to endure, I suppose. I photographed him all harnessed ready to trot away; he did not look well pleased. As I was exposing, I remembered the story of the man who was taken up for stealing the carrier's cart, who, when on his defence, swore that that cart had been in their family ever since it had been a small wheelbarrow; and I thought pug's was a very small wheelbarrow, that would never grow to be a useful cart.

The windmill is one of the special features of the Holland landscape. They come into view in all sorts of places likely and unlikely, and the land is so flat that they can be seen at great distances reflected against the sky.

I could not be satisfied without a photograph of a windmill, but found that the nearest available one to where I stayed was six miles away; no matter, I must have it. So my friends, Nellie and Nina, procured for me a neat little cart, and a fat little pony (thick little pony they called it), and thus equipped we crossed the Ysel ferry and, like Don Quixote, rode on to have a tilt at the mill. But I did better than the Don. History conveys the impression that he got awfully riled, whilst I returned home with pleasing impressions.

MARK OUTE.

Our Editorial Table.

PHOTOGRAPHY OF BACTERIA.

By EDGAR M. CROOKSHANK, M.B., &c.
London: H. K. Lewis, Gower-street.

WITHOUT desiring to produce a series of feats in photo-micrography, the author expresses his aim as an anxiety to encourage the attempt to make photography subservient to bacteriology.

After an introductory chapter, in which credit is duly given to some of those who have made investigations in photo-micrography, the author describes the apparatus employed in his own researches. He advises the beginner to commence with a low power and such an object as the blowfly's tongue, then passing onwards until he reaches tubercle bacilli with a one-twenty-fifth oil immersion objective and the limelight.

While he has tried pyrogallic development himself with great success, yet does the author speak in high terms of the iron developer, which he says "has the advantage of simplicity and cleanliness." After a complete treatise on photographic manipulation as applied to photo-micrography, a large number (eighty-six) of illustrations beautifully printed in autotype are given.

This work will necessarily encourage many to apply photography to all their microscopical work, as well as to that department to which it is specially directed. It is well got up.

MARION'S BROMIDE PAPER.

MESSRS. MARION & Co., of Soho-square, have sent specimens of bromised paper intended for being printed by ordinary gaslight under a negative. When making trial of it, we did not at first realise how exceedingly sensitive it was, hence we gave it an exceedingly generous exposure. But as five seconds proved too long, we eventually reduced the time of exposure to one second, the source of light being a gas-flame of average power, and with this we got excellent prints every time.

The developer employed was not strictly that which had been recommended but was some which we had mixed for another purpose, but it answered so well that we have no desire to use any other. It consists of one part of a saturated solution of ferric sulphate to five of potassic oxalate to which six drops per ounce of a twenty-grain solution of citric acid had been added. This gave pure whites and vigorous blacks of a good colour.

The ability to print by gaslight adds greatly to one's enjoyment of photography.

ANTI-COERCION GROUPS.

By A. L. HENDERSON.

It is generally known that the afternoon of Easter Monday was devoted to a series of political meetings in Hyde Park. Mr. A. L. Henderson took advantage of these gatherings to erect his camera on an exceedingly tall stand and take groups of those more prominently engaged in these anti-"coercion" demonstrations. The result is a series of skilfully executed cabinet groups, in which the figures are necessarily small but very distinct.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 5772.—"Improved Photographic Mounting Cards." L. WOLFF.—Dated April 20, 1887.

No. 5797.—"Portable Photographic Camera for Long and Short Focus Lenses." W. J. SMITH.—Dated April 21, 1887.

No. 5798.—"An Improved Process of Moulding the Impressions of Blocks, Electrotypes, or Zincographs, for Stereotype Plates." J. CAPRANI.—Dated April 21, 1887.

No. 5812.—"An Improved Photograph or Picture Holder." W. D. WILKINSON and F. FOWLER.—Dated April 21, 1887.

No. 5843.—"Improvements in Photographic Cameras." H. H. CUNYNGHAME.—Dated April 21, 1887.

No. 5902.—"Improvements in Photographic Lenses." T. R. DALLMEYER.—Dated April 22, 1887.

No. 5903.—"Improvements in what are known as Instantaneous Photographic Shutters." T. R. DALLMEYER and F. BEAUCHAMP.—Dated April 22, 1887.

No. 5923.—"Controlling the Action of Instantaneous Photographic Shutters with Detent Spring." G. S. MARTIN.—Dated April 23, 1887.

No. 5966.—"Improvements in Albums for Photographs." Complete specification. H. A. M. DITTMAR.—Dated April 23, 1887.

No. 6032.—"Improvements in Apparatus for Preserving and Changing Sensitive Plates used in Producing Photographic Pictures." Communicated by Messrs. Koppe & Moh. E. EDWARDS.—Dated April 25, 1887.

PATENT LAPSED.

No. 124.—"Reproducing on Metal Engravings by Photography." L. H. PHILIPPI.—Dated 1882.

PATENTS COMPLETED.

IMPROVEMENTS IN APPARATUS FOR HOLDING AND EXHIBITING VIEWS AND THE LIKE IN MAGIC LANTERNS.

No. 6431. JOHN THOMAS KEY, Machon Bank, Sheffield.—May 13, 1886.

MY invention has reference to an improved method of holding photographic views and the like, mounted as magic lantern slides, and for automatically placing the said views or like objects in the correct position before the lens with regularity and precision.

In carrying out my invention, I mount any desired number of photographs, painted subjects or similar "slides" in a circle, preferably by cutting out a series of suitably shaped apertures in a disc of cardboard, papier maché, or other material, and either permanently fixing the subjects therein, or making them removable, so that they can be changed when necessary.

The disc is provided with a centre hole, so that it can be secured upon the end of a spindle projecting from a case containing suitable mechanism, which, when wound up, will cause the said projecting spindle to revolve and carry with it the disc.

The mechanism or clockwork may be of any construction so that it is suitable for the purpose named, and it must be so contrived that its speed of travel may be varied at pleasure, and be instantly stopped and started whenever desired.

The case containing the mechanism may be permanently attached to the lantern or to separate therefrom, and its position may also be varied.

For example, the said case may be fixed in a position above the lens slide in front of the chimney, and so that when the disc is fixed upon the end of the projecting spindle the lowest subject shall be exactly in position with the lens of the lantern. On starting the mechanism, the disc revolves, and the various subjects or slides are successively brought before the lens; if desired, the motion may be intermittent like the seconds finger of a clock, having a rapid movement while changing the subject, and then resting or stationary for a time, or it may be slow and continuous.

The claims are:—1. The combination with a "magic lantern" of a circular mounting frame for holding any kind of views, paintings, or other objects suitable for "lantern slides," and caused to revolve by an arrangement of mechanism, either continuously or intermittently, and substantially as hereinbefore described and as illustrated. 2. For the purpose of showing photographic copies, paintings, or other subjects by the aid of a suitable lantern; a revolving frame or disc having the said subjects mounted thereon, and caused to revolve when desired by means of suitable mechanism, substantially as hereinbefore described and as illustrated.

IMPROVEMENTS IN FRAMES FOR HOLDING PHOTOGRAPHIC AND OTHER PICTURES.

No. 6590. RICHARD MANDER, Branton-street, Birmingham.—May 17, 1886. My invention relates to frames or holders for photographic or other pictures, and particularly of the kind known as screen frames, in which two or more enclosing frames are connected together, so as to hold a series of pictures both back and front, or front alone, and which said combination of frames are arranged to fold up or turn one upon another, screen or book-like; and the principle object of my invention is the jointing and general construction of such frames as hereinafter described.

In carrying out my invention I proceed as follows, and I will describe my invention in connection with a double screen, or a photographic screen in which two frames are jointed to a common middle support or pillar.

The middle pillar support consists of a piece of tubing of the exact height of the frame to be made, with its ends screwed or provided with screwed plugs, which extend a little beyond the ends; and upon the opposite sides of the said pillar hollow beadings or knuckles extend to within a short distance of the ends, and within these hollow beadings the joint pin or wire upon which the frames turn is secured.

The ends or outsides of each frame are constructed exactly the same as the middle pillar or support, with the exception that the knuckle beading is only upon the inside edge, instead of upon the two edges as described.

The tops and bottoms of the frame are made of troughed drawn metal of a V section, with a hollow beading or rib upon its outside edge, and these top and bottom parts I call the carrier ends, from the fact that they embrace and secure the photographs and glasses within the sides of the frame. These carrier tops and bottoms have return ends of the same cross section as the other part; these return ends are of a length equal to the distance between the ends of the pillar and sides, and the ends of the beadings carried by them, so that when the carrier or bracing ends are placed in position, the holes in the beadings of the return parts pass over or on to the joint pins or wires extending from the ends of the pillar and side beadings; that is, the beadings of the pillar and sides become coincident with the beadings of the return ends of the tops and bottoms before named; so that the hollow beadings of both parts constitute the knuckles or joint centres upon which the two flaps or frames turn. The carrier or bracing ends are bound and kept to the other parts constituting the frames by screw caps or screw terminals, taking upon the ends of the tubes forming the middle pillar and sides. The bases of the said caps or terminals are made broad, so as to slightly overlap the tops of the frames.

Instead of having simple beadings upon the sides of the tubes forming the middle and ends of the frame, enclosing sides of the cross section of the top may be employed instead. In this case the inside edges of the frame are made continuous or uniform in character.

The middle pillar with its two side beadings, the sides with the single hollow beading, and the bracing ends or tops and bottoms, with their hollow beadings, are respectively made in one piece, by the process of drawing through or by rolling, or the knuckles may be attached, if necessary, separately, by soldering or otherwise.

By constructing photographic screens as described, the frames are made up of segments or parts, which, when put together, are hinged upon a middle stile or support.

Instead of a twofold screen, a three, four, or any other desired number, may be made in the same way, by providing the inside uprights with double beadings or knuckles to form the joints upon which the adjacent frames turn upon as joint centres, for folding up or opening out.

To introduce a photographic or other picture remove the terminal caps from either the tops or bottoms of the uprights, then remove or draw the enclosing top or bottom from off the pins or wires forming the centres upon which the sides turn; when this has been done slide the picture or photograph between the uprights, with its forward end resting within the trough of the embracing end not removed, then place the other end in position and secure it down by the terminal caps.

Although I have described my invention in connection with a double frame or screen, yet my said invention is equally applicable to the making up of single frames.

AN IMPROVED APPARATUS TO BE USED IN CONNECTION WITH A MAGIC LANTERN FOR ADVERTISING AND OTHER PURPOSES.

No. 6642. MARY WALLACE UTTINO, Woodlands, Anfield, Liverpool.—May 18, 1886.

An apparatus to be attached to a magic lantern for the purpose of moving by means of springs and clockwork machinery a circular disc, and to be placed in

such a position that one of the segments of the disc may be in the focus of the lantern. This disc to be divided into segments, each segment to contain an object intended to be shown by the lantern. The movement of the disc to be regulated by the clockwork machinery so as to bring each object into the focus of the lantern at regular intervals. The apparatus to be of such power that it may be capable of sustaining action for a number of hours. The uses of the above are intended specially for the purposes of advertisement.

The claim is:—The application of any mechanical power or combination for the purpose of automatically changing the objects to be shown by a magic lantern.

IMPROVEMENTS IN PHOTOGRAPHIC SHUTTERS.

No. 7156. ARTHUR SAMUEL NEWMAN, 87, Evershot-road, Finsbury Park, Middlesex.—May 27, 1886.

My invention relates to improvements in the means and apparatus employed for opening and closing photographic shutters, and in regulating the time of exposure of the photographic plate or surface on which the image is cast.

According to my improvements, the time of exposure can be varied from the fraction of a second to a few seconds, or for any time, according to the will of the operator.

For this purpose in carrying out my invention the shutter (which may be of the ordinary kind used for rapid work) is connected to a loosely fitting piston moving up and down in a metal cylinder, into which the air enters, and the time of exposure is governed by the rate at which the air is forced out and re-enters the cylinder. This is effected by means of a series of perforations of graduated size in the top of the cylinder, over which a cover revolves so as to cover or to expose the whole or only a part of such perforations. The larger the extent of the perforations exposed the more rapid is the action of the shutter and the shorter the exposure.

A slot or aperture of graduated size may be cut in the top of the cylinder in place of a series of holes.

The actuating mechanism consists of a convolute wire spring or watch spring which is wound up by an axis or stud on the frame of the shutter, one end of the spring being attached to the rotating stud and the other to the fixed plate or frame. A bar is fixed on the end of the rotating stud, one end of the bar being connected by a link or rod to the piston, and by which it is moved up and down in the cylinder when the stud is turned. When the stud is turned half a revolution, a projection on the end of the arm engages with a catch on the letting-off lever, and retains the shutter wide open for focussing, another half revolution acting to close the shutter again, the spring at the same time being wound up and retained by a projection on the other end of the bar, engaging with the same lever catch as before.

When it is desired to give an open exposure, all or nearly all of the apertures are closed; the shutter is raised, and retained by the catch until released at the will of the operator.

It will thus be seen that the time of exposure can be regulated to any period required, and repeated any number of times or at any interval, and can be set again after other periods of exposure have been used, the resulting speed being always the same, with the same setting.

The shutter may be arranged to act in the diaphragm slot without alteration to lens in any way.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
May 2	Notts	Institute, Shakespeare-street.
" 2	Blackburn	
" 3	North London	Myddelton Hall, Upper-st., Islington
" 3	Glossop Dale	Society's Rms., Norfolk-sq., Glossop
" 3	Holmfirth	
" 3	Sutton	Society's Rooms, 18, High-street.
" 3	Sheffield	Masonic Hall, Surrey-street.
" 3	Coventry and Midland	Coventry Dispensary.
" 3	Bolton Club	The Studio, Chancery-lane, Bolton.
" 4	Edinburgh Photo. Society	Hall, 20, George-street, Edinburgh.
" 4	North Staffordshire	Mechanics' Institute, Hanley.
" 4	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 5	Bolton Photographic Society	
" 5	Dundee and East of Scotland	Lamb's Hotel, Reform-st., Dundee.
" 5	Leeds	Philosophical Hall, Leeds.
" 5	London and Provincial	Mason's Hall, Basinghall-street.
" 6	Yorkshire College	
" 6	Halifax Photographic Society	M. Manley's, Barum Top.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

The technical meeting of this Society held on Tuesday evening was presided over by Mr. W. England.

Mr. H. Trueman Wood exhibited a portable electric lamp of three-candle power. It was originally intended as a railway reading lamp, but had since had a red glass fitted in front so as to adapt it for the dark room. It was made by Mr. Pitkin, and operated by a small storage battery fitted with an adjustable resistance. When charged it would run for seven or eight hours without diminution of light. The principle feature of the battery was that perforated plates of vulcanite were used to separate the battery plates.

The Chairman exhibited a box with levelling screws which he had fitted to the top of his tricycle. In it was contained a quarter-plate camera which could be operated on in the streets without attracting attention. A number of negatives taken by its agency were exhibited. These consisted of instantaneous street views.

Mr. THOMAS SAMUELS exhibited a detective camera which assumed the form of a brown-paper parcel. He promised a description of it at the next meeting. Mr. JOHN JACKSON (from the Eastman Company) then gave a demonstration

of the whole process of stripping films. It differed in no essential respect from the description given by us three weeks ago [see page 209]. In one minor point, however, there was a difference, and one which conduced to the better working of the process. It will be remembered that we described the preparation of the glass on which the collodion was spread as having been effected by the rubbing over of the surface with powdered French chalk. But Mr. Jackson finds that the end desiderated is better attained by giving the glass a coating of a substratum composed of indiarubber dissolved in benzole in the proportion of one grain to the ounce.

Mr. Jackson's demonstration was highly successful.

In reply to a question as to the length of time that might be allowed to elapse between the developing of a negative on the paper and stripping the film, Mr. W. H. HYSLOP said that, as recorded by him in the two weekly journals a few weeks ago, an interval of twelve months at least was permissible.

Mr. WOOD spoke of the facility with which he had managed the stripping of films at the first attempt.

Mr. WILLIAM COBN having made an inquiry as to whether Mr. Jackson ever experienced any difficulty in printing by the cockling of the film negatives, elicited from that gentleman a remark that he had not.

Mr. SPIERS had recently taken four dozen negatives which he had stripped. Speaking of certain white marks which he had sometimes seen, he was told by the Chairman that in all probability it was oxalate of lime, which would disappear on applying an acidulated wash.

The possibility of the paper support expanding while wet, and thus distorting the picture, was raised by Mr. W. E. DEBENHAM, but nothing new was elicited on this topic.

A plate holder, the invention of Miss White, was exhibited by Mr. T. Bolas. The next technical meeting will be held on the 24th proximo.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, April 21, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. Herbert Starnes presided.

Mr. E. CLIFTON had well washed a print but not toned it; then he kept it a long time until it was yellow all over; he next toned half of it in a borax bath, and it came out all right; he exhibited the two halves to show how the yellow in the whites had toned out in one of them.

Mr. A. L. HENDERSON remarked that the best half of the print would have been better had it been upon freshly prepared paper and toned without delay.

Mr. CLIFTON said that he did not deny that.

Mr. HENDERSON stated that the acetate toning bath had an advantage over all the others in that it tended to give a less mealy print. He exhibited a print of a horse-race in which the running horses came out quite sharp, and all the motionless parts of the scene were blurred; the picture had not been taken by him self.

Mr. W. H. PRESTWICH said that the camera must have moved during exposure in relative proportion to the motion of the horses.

Mr. HENDERSON remarked that that was also his explanation.

Mr. W. M. ASHMAN said that the effect had once been ascribed to movement of the swing back.

Mr. HENDERSON replied that examination of the print did not bear out that view.

Mr. F. W. COX exhibited platinum prints taken upon paper five months old, also some other platinum prints developed with a twenty-per-cent. cold solution of washing soda; the time of development was about ten seconds. The prints were good ones, but not, he thought, superior to those developed in the usual way.

The CHAIRMAN said that the time of development should give a power of checking density.

Mr. J. B. B. WELLINGTON stated that Hubl's book mentions the use of carbonate of soda, says that it has inferior developing powers, and that it throws down a precipitate upon the paper.

The CHAIRMAN remarked that there was no precipitate upon Mr. Cox's prints.

Mr. COX added that the pictures before them had been printed in the first instance very much deeper than usual.

Mr. Wellington exhibited some platinotype prints.

Mr. T. Kerr exhibited some sepia-coloured also some black prints in platinum.

Mr. Wellington exhibited orthochromatic results upon a gelatino-bromide plate dipped in cyanine.

The CHAIRMAN exhibited some lantern slides mounted by means of lengths of the paper slips used in the Morse telegraph printing instruments; he remarked that such strips could be obtained of enormous length, evenly cut. He also exhibited an old-fashioned carpenter's plane for cutting wooden grooving, and some good results which had been obtained by its use.

Mr. A. HADDON asked if any one had tried ammonia for fixing albumenised prints.

The CHAIRMAN thought that Hardwich had, in 1853, proposed its use.

Mr. J. B. SPURGE, in reply to a question, said that the difficulty in the way of introducing his sensitometer to the public on a large scale was the necessity for the previous construction of a set of Whitworth true gauges for boring the holes; to make them singly without such gauges would be too expensive for the purchaser. The sensitometer once made needed no special care; it was always in good order, and it had such a range that sometimes when the smallest aperture just gave an indication there was a reversal of the image on the largest, giving clear glass.

Mr. WELLINGTON had recently seen Professor Dewar excite a luminous tablet at the Royal Institution and extinguish its light by dipping it in cold water; then by breathing on it he brought out the phosphorescence again.

Mr. SPURGE said that with pure bromide of silver he had found the ratio of action equal between daylight and gaslight.

Messrs. A. Watkins and Harry J. White were elected members of the Association.

Next Thursday Mr. Spurge will read a paper upon *Variations of Developing Action as Tested by Spurge's Sensitometer*.

CAMERA CLUB.

ON Thursday, April 21, an address was delivered by Mr. T. BOLAS on *Photographic Processes for Book Illustration*, and a most interesting lecture was made doubly useful by the exhibition of a series of blocks and prints in illustration of the subject.

Mr. LYONEL CLARK occupied the chair, and, previous to calling upon the lecturer, drew attention to a simple instrument for timing exposures.

Mr. BOLAS then entered upon a description of the processes suitable for printing with type, and treated of methods in regard to lithographic and zinc work, solid photographs, and the means of obtaining granularity. Pretsch's work of twenty-seven years ago he considered had hardly been surpassed. Dallastint was called a secret method, and would, considering its merits, probably have been much more widely used could it have been fully pushed. Blocks and prints of Woodburytype, Dallastint, Messrs. Bullock Brothers' work, Ives's process, and colotype, were handed round.

Mr. GEDDES, in a most interesting speech, pointed out how amateurs might make blocks from their own negatives, and referred to the great pleasure sure to attend such work. He gave a descriptive account of the colotype process and exhibited prints from blocks prepared from Eastman's stripping films, which he strongly recommended as being usable from both sides.

Mr. BOLAS remarked that it was a necessary thing to be careful to obtain reversed negatives, and he drew attention to an illustration in an American journal as a fearful example, where the subject was a figure writing with the left hand, and the picture was furthermore defective for several other reasons. It was named *Welcoming an Intruder*, and showed what the Americans could put up with.

Mr. TRAILL TAYLOR did not know what they could put up with in America, but he would like to show some specimens of colotype work done there which he would venture to say were equal, if not superior, to anything done in this country. He had seen it done, and the working was of the simplest description. A smooth and not ground-glass surface was employed. [The prints exhibited were of very fine finish, and, having a burnished surface, could hardly be distinguished from direct photographs.] Mr. Taylor then described a printing process suitable for amateurs, a copper cast being finally obtained.

Mr. W. E. DEBENHAM said that when in Munich, Albert was using only plain glass.

The CHAIRMAN said that the addresses of Messrs. Bolas and Geddes had opened up quite a new field for amateur photographers, and doubtless many present never considered it possible for amateurs to produce printing blocks without going in for a most expensive outfit. He should like to have heard of one or two other processes, examples of which he had come across in the journals, such as that of Fox Talbot and a French (Joubert's) method, a carbon process.

Mr. BOLAS described Talbot's process, in which a copperplate is etched by perchloride of iron through a film of bichromated gelatine. The French method (Joubert's) was a colotype process. Goupil's was similar to Woodbury's, and a roughened gelatine was used.

After some remarks from Mr. GREATHEED the proceedings terminated with a vote of thanks to the lecturer and Mr. Geddes.

The next Club excursions will be to Gomshall, Wootton, and Abinger, on May 14, and to Westerham on June 4, both Saturdays.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

AT the meeting held on Tuesday, April 19, at Myddelton Hall, Islington, N., Mr. L. Medland in the chair, Messrs. J. Bird, A. Liddle, and A. Wybrant, were elected members of the Society.

A large number of views taken by members at the Easter Monday outing at Maidenhead was exhibited.

Mr. F. W. COX showed some platinotype prints for the development of which he had used a cold solution of common washing soda instead of the oxalate of potass usually employed.

Mr. George Smith exhibited a quarter-plate camera with a series of lenses of varying focus especially suitable for making lantern-slide negatives.

A large number of slides was then exhibited by means of the optical lantern.

The CHAIRMAN announced that at the next meeting of the Society, on May 3, Mr. Alexander Mackie would lecture on *The ABC of Photographic Emulsions*. Visitors are invited to attend.

MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.

THE monthly meeting of the above Society was held on the 19th instant,—The President, the Rev. H. J. Palmer, in the chair.

The following gentlemen were elected members:—Messrs. W. Bolton, Beswick; T. Morley Brooke, Withington; C. F. Budenberg, Whalley Range; J. M. Frankish, Arlwick; A. Hamilton, M.D., Ashton-under-Lyne; Walter Noar, Lower Broughton; and James Shaw, Great Ancoats-street, Manchester.

Mr. J. G. JONES read a paper on *Gas Bags versus Gas Bottles*, describing the advantages, and comparing the first cost and also the cost per hour of each system of lantern illumination.

After the discussion by the members of queries taken from the question box, Mr. J. E. THORNTON exhibited his patent roller slide, and also exhibited a small detective camera.

Mr. LACHLAN M'LACHLAN, by request, exhibited a negative and prints of his large photographic group, *The Royal Family at Windsor*, and gave some details of the work in taking the same. The members were given an oppor-

tunity for inspecting the large negative, which was a remarkably fine one, and capable of yielding prints four feet four inches by two feet two inches.

Mr. E. Briggs showed a series of lantern slides, using the lantern recently presented to the Society.

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

THE ordinary meeting was held in the College of Science, Newcastle-on-Tyne, on the 12th instant,—Professor Herschel in the chair, when

Mr. JOHN JACKSON, of the Eastman Dry Plate and Film Company, gave a demonstration of the Company's new stripping films. All the various operations were successfully carried through and followed with close interest by a numerous attendance of members and friends. The specimen negatives and prints were much admired.

The usual vote of thanks was proposed by the CHAIRMAN.

PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A MEETING of the Society was held April 6, 1887,—The President, Mr. Frederic Graf, in the chair.

A question in the box asked, "Is there any method of toning positives on glass?"

It was stated in reply that lantern slides were frequently toned in solutions of sulphuret of potassium, bichloride of palladium, and bichloride of platinum.

Mr. WALMSLEY suggested slightly under printing the slides, bleaching with bichloride of mercury, and then toning with sulphite of soda. As the latter acts as an intensifier, it is necessary to print light, or the slide will be too dense.

Mr. BARTLETT directed attention to an intensifier for gelatine plates which he had received from Mr. John G. Cassebaum. It possessed marked advantages over mercury, being gradual in its action, perfectly under control, and affording any degree of intensity required, without interfering with the printing qualities of the negative. It is necessary to submit the negative to be strengthened to a preliminary bath to make it slightly acid. This bath consists of—

Nitric acid	10 drops.
Chromic alum	1 ounce.
Water	20 ounces.

Citric or acetic acid may be substituted for the nitric in the proportion of one ounce to twenty of water.

Stock solutions are made as follows:—

A.	
Gallic acid	120 grains.
Alcohol	1 ounce.
B.	
Silver nitrate	30 grains.
Water	1 ounce.

One drachm of each of the above solutions is added to each ounce of water. The plate is put in an ordinary developing dish and the solution poured over and gently rocked to and fro. The negative will gradually come up and may be carried to any degree of intensity. Mr. Bartlett also mentioned the investigations of Dr. Lohse on the modifications of the alkaline developers for bromide of silver plates, as published in the *Photographische Correspondenz*. Dr. Lohse, in his trial of the various alkaline earths in connection with pyrogallic acid, found that borax (bi-borate of soda), contrary to his expectations, proved perfectly inert, producing not the slightest action upon the latent image. He further found that even the addition of soda or ammonia produced no action, while the borax remained present the plate lay perfectly white in the dish. It was only after washing out the borax from the film that the action began and was completed. The borax does not neutralise the action of the light, but prevents the reducing action of alkaline pyro developer. He accordingly suggests that this salt might be of advantage as a retarder in the developer. Mr. Bartlett, acting upon the suggestion, added one drop of saturated solution of borax to the ounce of developer, and found that the addition acted as a clearer of the negative without any appreciable retardation of the development.

Mr. JOHN G. BULLOCK showed a chart which had been brought to the meeting by a visitor, which was a valuable aid to those who were called upon to photograph buildings or other subjects requiring to be taken from some special point, to obtain the best effect with a certain sized plate or with any special lens. A base line was ruled across the bottom of the chart and a perpendicular line down the centre. From the point of intersection the angles radiated, and were ruled off on either side of the perpendicular line, every five degrees being shown, red and black alternately, making it easier to trail them up. Perpendicular lines were ruled on either side of the centre at distances corresponding to length of all plates used. The central vertical line was graduated in inches and centimetres. Horizontal lines were laid off at a length corresponding to the longest plate each lens would cover, and at a distance from the base line corresponding to the equivalent focus of the lens. The angle line, intersecting lens line, and plate line, would give the angle included and the particular size of plate, and any number of lens foci could be laid down, and the angle of any lens or size of plate could be seen at a glance. The chart shown was 22×26, but angles of lenses of longer focus could be read by taking half the focus and half the length of plate. Mr. Bullock also mentioned a peculiar circumstance in connection with a copying lens recently imported by Mr. Partridge, a member of the Society. It was found that from some cause, at first unaccountable, every plate exposed with the lens was slightly fogged. New baths and developers of all kinds were tried, and camera and dark room were carefully examined for cracks where light might leak in. A critical examination of the lens revealed the fact that owing to the angle at which the inner end of the lens's mount was bevelled its extreme inner edge was struck by some of the rays of light after passing through the lens, and they

were reflected in the shape of diffused light upon the plate, thus causing the fog. The difficulty was entirely overcome by use of a cardboard diaphragm so placed as to cut off these rays before they reached the reflecting edge of the mount.

Correspondence.

Correspondents should never write on both sides of the paper.

GELATINE PLATES FOR COPYING LINE WORK.

To the EDITORS.

GENTLEMEN,—Referring to your article in the JOURNAL of the 15th instant on this subject, I venture to make a suggestion, namely, print on Eastman paper instead of silver. A moderately dense negative, such as can easily be obtained on gelatine plates with ordinary development, will give absolutely black and white prints if worked with artificial light such as gas. Moreover, the colour and surface closely approaches the original. I have a pencil drawing so copied that few persons could detect that it was a photograph at all. Of course Eastman paper is dearer than albumenised, but the result for line work is so infinitely better, and the fact of its being capable of being used at night greatly mitigates this disadvantage, to say nothing of the rapidity with which a number can be printed. If there is no changing of negatives, once the exposure is hit off a dozen can be readily done in an hour (washing, of course, excluded). I enclose one or two specimens, which kindly return at your convenience.—I am, yours, &c.,

GREENWOOD PIR.

P.S.—Last autumn I copied a large series of parchment deeds, in many of which much density was difficult to obtain, but on the Eastman paper, in most cases, obtained good results.

G. P.

META-BISULPHITE OF POTASH.

To the EDITORS.

GENTLEMEN,—Allow me to add my testimony to Mr. Pringle's as to the excellent keeping qualities of pyro solution with meta-bisulphite of potash. I have used, by chance, exactly the solution he suggests, namely, ten per cent. pyro and five per cent. meta-bisulphite, for about a year, and have kept it at least six months without the least apparent change. Instead, however, of a mere ten per cent. bromide solution as a restrainer, I have used for a long time past one containing ten per cent. bromide of potassium and an equal quantity of citric acid, which may be preserved from mould for an indefinite time by the addition of a small lump of camphor. (I may remark that camphor is equally effective in preserving gum mucilage.)

For developing most makes of rapid plates, I find that twenty drops of pyro, five drops of restrainer, and ten drops of twenty-five per cent. ammonia to the ounce, forms a very good standard developer. For under exposure the ammonia may, with many makes of plate, be doubled, while for over exposure I always keep a spare cup at hand, with, say, fifteen drops of restrainer in it, and if the image comes out too soon or the details follow the sky too rapidly, I pour the developer into it, and back on the plate, when development is almost instantly checked, and when started again with five to ten drops more ammonia will give as much density and contrast as is required. If insufficient detail appears, a less restrained developer may again be resorted to.

I do not know what "latitude of exposure" is admissible with this mode of development, but it is certainly much greater than with any reasonable quantity of plain bromide. As an experiment, I once exposed two Paget XXX plates under a negative, one four times as long as the other; the shortest was quite fully exposed, while the longer developed into a plucky transparency so clear in the lights as to be used successfully in the lantern, and this does not at all represent the limit of what may be obtained.—I am, yours, &c.,

HENRY R. PROCTER.

Tynemouth, April 24, 1887.

P.S.—I think that where the drop bottle is used the strength of the pyro solution might be doubled with advantage.

AN AUTOMATIC PRINT WASHING WHEEL.

To the EDITORS.

GENTLEMEN,—In THE BRITISH JOURNAL OF PHOTOGRAPHY of January 7, 1887, in a leading article on the washing of bromide prints, much stress is laid on the importance of direct washing with water from a rose, as by this means the hypo is more thoroughly eliminated than by much soaking, even in running water.

Actuated by the above, I have had an automatic print washing wheel made by the local tinman, and I find that it works well. I therefore venture to send you a description of it, as I believe it will prove useful to amateurs, and as I hope that the principle is capable by extension of being utilised on a large scale. The principle is that of the overshot water-wheel. Fixed round the circumference of a light wheel is a series

of tin plates, each turned up at one border into a trough. The prints are fastened on these plates and are washed by water from a rose; this water, by filling the troughs in succession, turns the wheel.

To enter into details, I had better describe a wheel which I have had made for washing twelve cabinet prints at a time. It is two feet in diameter and three inches wide. Round its circumference it carries twelve tin plates with their troughs. The plates overlap the wheel by two inches on each side. Their side edges are turned up a quarter of an inch to keep the water on them. Holes are bored through the plates in positions corresponding to the corners of different sized prints, and the prints are retained in position by means of ordinary pins passed through these holes into pieces of cork at the back.

The rose is a flat one, seven inches wide and tapering to a supply tube three-quarters of an inch in diameter. At its lower end, where it is seven inches wide and one inch thick, it has a single row of small holes three-eighths of an inch apart. This rose allows enough water to wash the prints. It does not waste the water supply, as it uses about nine gallons in one and a half hours, and it suffices to turn the wheel. In fact, it is necessary for the lower segment of the wheel to work in a trough, with a depth of water varying according to circumstances. The water in the trough acts as a break in preventing the too rapid revolution of the wheel, and it further washes the prints.—I am, yours, &c.,

S. L. DONIE, *Surgeon-Major, 4th Madras Cavalry.*

Kamptec, India, March 30, 1887.

P.S.—In practice it will be found that the prints, on thick or thin paper, adhere, when wet, to a smooth surface so firmly that they need no pinning on to the wheel.

THE LATE J. B. OBERNETTER.

To the Editors.

GENTLEMEN,—The following are some details of Obernetter's career which have just come to my hands; they might be interesting to your readers.

J. B. Obernetter was born on May 31, 1840. He studied chemistry at Leipzig in 1858 under Professor Erdmann, and subsequently at Heidelberg under Bunsen, and finally at Mnich under Professors H. Pettenkoffer, Liebig, and Kaiser, all more or less great authorities. Upon Liebig's recommendation he devoted himself to photography, and entered the *atelier* of Albert, where he made his first two inventions, enlargements on developing paper and a process of photography on porcelain. Establishing himself in 1863, Obernetter soon produced the well-known collodion-chloride paper a few years later. Upon the suggestion of Albert, his former employer, Obernetter worked out his process of phototype "Lichtdruck," which was afterwards bought by Albert and further perfected by both. Obernetter further simplified and perfected it by his dusting-on process with graphite, for which he obtained the gold medal at the Vienna Universal Exhibition. Upon the suggestion of Dr. Maddox for a gelatine instead of a collodion emulsion (1880), Obernetter worked out and soon produced a gelatine emulsion, which still enjoys an unequalled reputation. His gelatine emulsion paper, produced some time later, has also gained a great reputation already, and is only surpassed as an invention by his yet more important work, the production of an orthochromatic plate for landscape work applicable without the yellow screen.

Last, not least, is to be mentioned his invention of a process of photo-copper printing by direct transfer of the image from the negative to the copperplate—a process for which we may anticipate a great future yet.

He died on the 13th instant from syncope of the heart, after a few days indisposition.

We may well lament the loss of a man who has done so much for our art and from whom, had he lived, much more might yet have been expected.—I am, yours, &c.,

J. R. GORTZ.

19, *Buckingham-street, Strand, April 25, 1887.*

COLONIAL AND HOME GRIEVANCES.

To the Editors.

GENTLEMEN,—As our Colonial brethren are airing their woes, will you permit me to give a statement of the treatment some of the home customers of London stock-houses obtain? A month or so back I bought from a firm a 10 × 8 universal studio camera, warranted perfect and complete, to take two *cartes-de-visite* on a half-plate, two cabinets on a whole-plate, single whole-plate and 10 × 8. "Monitor" will please note that this was a make of camera of which large numbers have been sold, and was sold as new and of the most modern and improved pattern to a professional photographer, and without complaint on seller's part of any unreasonableness on the part of the purchaser. Well, I got the makers to cut the fronts for a 2b and a 10 × 8 lens respectively, and when the camera came to hand I set to work and placed the 2b on its front; but on trying the 10 × 8 flange, found the opening in the camera front far too small for the flange—this in a camera specially made for a 10 × 8 portrait lens, i.e., one of 4½ diameter!

On seeing the makers they were very sorry, they knew the front was too small, and had determined not to have any more like it, and if in any

way they could possibly fix the lens on, short of making a new front to the camera, they would be pleased to do it.

After a lot of scheming I made a makeshift, and fitted the lens upon the camera. I then proceeded to take a group of children, and, having focussed, tried to throw up the screen and insert the dark slide, but the handle of the focussing screw stood upright and prevented the screen from moving. I shifted the front of the camera a short distance on the off chance that when the group was again focussed the handle of the focussing screw might be downward; by chance it was so, and the picture taken. The camera was then examined, and two hours wasted while the screen was removed and a gap made in the frame of it sufficiently large to permit it to clear the handle in all positions. On examining the shifting screens at the back, they were found to be made for Malvern, promenade, and boudoir, instead of *cartes-de-visite* and cabinets, as the carriers in dark slide were.

The next thing was, that when two *cartes-de-visite* were taken on a half-plate one picture was always out of focus, and a close examination of carriers showed that the half-plate one had been planed away in the rebate at one end to the thickness of stout paper!

In addition to the stupid weakness of the carriers, they have about half an inch of side play, and any one who knows the large amount of light in the modern dark room will see the advantage of this when squeezing two cabinets upon a whole-plate. When the camera is racked out to take a large head the bellows go flat, being about three folds too short, and when you are taking a smaller size the camera front has such slack side guides that it is possible to get it half an inch out of parallel with the back unless you take a rule and measure it.

But why make a fuss about such a trifle as that? one is not always copying! And if the carriers are only one-eighth thick where strength was needed, you have good half-inch timber in the back screens where a piece of thin zinc would have been sufficient.

I have enclosed a piece of the half-plate carrier for the inspection of the Editors, and shall be pleased to show the camera to any gentleman who will honour me with a call.

J. D. COOPER.

Montague Studio, Kingston, S.W.

THE RIGHT TO THE NEGATIVE.

To the Editors.

GENTLEMEN,—I have watched the correspondence in your columns on the right to the negative, and the many *absurd* reasons put forth by people who ought to know better why the negative can be demanded by the client. No negative is ordered or paid for, but a number of photographs, one or many, as the case may be, which are paid for, and there is an end of the matter. Of course if you bring the intricacies of the law to bear on the subject *there is no end to it.*

I should not hesitate, if in Mr. Debenham's position, to let the party have his negative, and charge him 20s. per year for warehousing and care of negative (or more); that might settle the matter. Certainly no court of law would refuse so modest a demand. Query, Why should photographers be supposed to use negatives at all? Are we obliged to say how we produce our work? I am not a high authority, but I think this is to the point.—I am, yours, &c.,

FREDERICK BARBER.

1, *Orchard-street, Church-street, Sheffield, April 23, 1887.*

To the Editors.

GENTLEMEN,—There has been a considerable amount of writing on the subject of who is the owner of the negative. I have read it carefully, hoping that some abler pen than mine would point out where, in my opinion, the gist of the matter lies, but none have yet done so. It is this—Is it, or is it not, the practice to charge more for the first supply of prints than for subsequent orders? If so—and I think it is—is not the extra charge for taking the negative? And, if so, how can the photographer claim as his that for which he has been paid?—I am, yours, &c.,

J. E. G.

PHOTOGRAPHING ON DEAL PIER.

To the Editors.

GENTLEMEN,—I can fully confirm your statement about the restrictions at Deal Pier.

Some years ago there was a large fleet of vessels anchored in the Downs off Deal. I was at that time visiting there, and having my camera and tent with me was anxious to obtain photographs of the fleet from the pier head. The toll-keeper, however, refused me access, and I then sought out the Manager of the Company, Mr. Laidlaw, who, notwithstanding my informing him I was only photographing for my recreation and amusement, refused to sanction my going on the pier with my camera, informing me a local photographer had the sole right.

This degrading the right to photograph at any point of interest to a money question is one of the things that tends to give photography such an elevated status that it has occupied lately, and to develops those feelings of cordiality between the amateur and professional which used to exist.

I have often sat and sketched on Deal Pier, but the nice distinction between a sketching block and a camera is apparently now reduced to a question of money payment.—I am, yours, &c.,

FRANK HOWARD.

Wallingford, Berks, April, 1887.

Exchange Column.

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

Wanted, camera in exchange for portrait lens by Slater.—Address, J. COLLINOR, Photographer, Nelson, Lancashire.

A diffraction grating in exchange for first-class 12x10 or 10x8 lens for architectural purposes.—Address, G. W. VALENTINE, 156, High-street, Southampton.

Will exchange a musical album, playing two tones, for two double dark slides (Lancaster's quarter-plate instantograph).—Address, GOWER, Vicarage-road, Teddington.

Rock finisher, a six-inch roll, and a twelve-inch roll, in exchange for portable camera, not less than 7½x5. Difference adjusted.—Address, G. W., Photographer, Grange-over-Sands.

Required, a whole-plate camera suitable for outdoor work in exchange for a nine-carat double gold chain with tassel appendage.—Address, EDWARD J. HUGHES, Graigue, Co. Kilkenny.

Wanted to exchange, Grimston's whole-plate pneumatic shutter (fits into slot of Ross' rapid symmetrical lens) for Guerry's flap shutter, same size.—Address, F. HOARE, Coxwell-court, Cirencester.

Wanted, good half-plate lens, either Ross' or Dallmeyer's rapid doublets preferred, for Meagher's 5x4 tourist camera with three doubles, &c.—Address, F. W. TREAWAY, 26, Trinder-road, Crouch-hill, N.

I will exchange a 5x4 camera, with two double dark slides and one single slide, for a half-plate camera with three double dark slides. Difference in cash.—Address, Wm. MARSHALL, 13, Ripon-street, Moor Park, Prestou.

Wanted, a 12x10 tourist camera, with two or three double dark slides, in exchange for a whole-plate camera by Dallmeyer, with three double and one single dark slides, and a 8½x6½ rapid doublet lens.—Address, W. BOND, Photographer, Bank-place, Norwich.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

COL. GUBBINS.—All the four gentlemen mentioned are amateur photographers.

ESLAFORDE.—We have already invited photographers to send us specimens of spotted prints, and the details of the circumstances under which they appear.

J. BROWN (Pontefract).—It is not advisable to use zinc for the purpose unless the metal is well protected with Brunswick black or other impervious varnish.

E. L.—Out of the lenses you name B will be the best for cabinet pictures; A is too short a focus for taking good cabinet portraits. It would have to be approached too close to the sitter.

S. J.—The oval rims and glasses for photographs mounted in optical contact with the glass are supplied by Messrs. Marion & Co., Soho-square, and by most other dealers in photographic requisites.

RETOUCHER.—The only plan we can suggest is that you advertise for negatives such as you require. Perhaps one of your photographic friends may lend you a few, and that would answer your purpose.

ARTHUR MAYCOCK.—With enamelled photographs the spotting must be done before the print is treated with the gelatine, and not after the picture is finished. We know of no preparation for spotting enamelled prints after they are mounted.

T. T. L.—Without seeing the negatives or knowing more of your method of working it is impossible to give the reason why all the skies in your pictures print dark. Possibly the skies were dark when the negatives were taken, or, it may be, that they are much over exposed.

T. A. ELWORTHY.—From the fact that the prints have changed so rapidly it is clear evidence that they were imperfectly fixed. Five minutes immersion in solution of hyposulphite of soda, one ounce to the pint of water, is far too short. You had better go back to your old method of fixing if you desire your pictures to be permanent.

TONING BATH.—The pink colour in the toning bath is due to a reduction of gold from some cause or other—probably by some foreign substance introduced either with the prints or on the fingers. It is possible that the discolouration may be due to the action of light. A toning bath when out of use should not be exposed to a strong light, as that will tend to reduce the gold.

CAPE TOWN.—Your lens is an orthographic of somewhat long focus. You can ascertain the length by approximately focussing the sun, and then measuring from the point to the front surfaces of the anterior lens. If you employ the lens for portraiture you will require a very long camera, and the sitter will have to be placed at a long distance from it. These lenses give exceedingly fine definition, and are very useful instruments.

STUART L. LEONARD writes: "In THE BRITISH JOURNAL OF PHOTOGRAPHY of last week, in the report of the proceedings of the London and Provincial Photographic Association, mention is made of a neat little portrait lens very suitable for a detective camera; could you tell me where such a lens is to be procured, as it is just the thing I want?"—The lens alluded to is one of the Petzval form, and is known as the instantaneous stereoscopic lens. It may be obtained of either Messrs. Ross or Dallmeyer. Some other firms also supply a similar lens.

C. B. VANDCLEUR says: "I should feel much obliged if you would inform me, in your 'Answers to Correspondents,' how to get rid of a stain on a negative which was produced while intensifying in the following manner:—After bleaching with a solution of bichloride of mercury I omitted to wash the negative thoroughly, and on pouring on the ammonia solution it became badly stained."—Stains of this description can seldom be removed. Sometimes a solution of cyanide of potassium will help matters. Possibly some of our readers can help our correspondent.

D. BENNE asks: "Would you kindly answer me on the following through the JOURNAL? I have got two *carte-de-visite* cards handed in to me to try and copy them; they are very old and much faded. Is there any means by which they could be revived a little?"—If the prints be removed from the mounts and immersed in a dilute solution of the bichloride of mercury any yellowness in the prints will be removed, but no detail which has faded out will be restored. Yellow and unpromising looking prints frequently copy very much better than they at first sight might be expected to do. Our correspondent should make a trial with the pictures as they are before resorting to other treatment.

C. P. writes as follows: "Having decided to go in for enlarging by artificial light, I intend to buy a nine-inch condenser (double), and I have an enlarging box. 1. Will you kindly answer me what is the best light that will give an uniform white strong light (not the electric or limelight), and at the same time giving a sharp image?—2. Will an Argand gas burner answer better than either ordinary oil lamp or gas?—3. Would the nine-inch condenser answer well for enlarging from either quarter or half plate, as I am in the habit of enlarging from the half-plates? I have always enlarged by daylight, but I found that the light is always unreliable and changing."—In reply: 1. Any of the best forms of paraffine lamps will answer, so will magnesium. It is a good plan to place a diaphragm with a moderate size opening between the light and the condenser.—2. An Argand gas burner will give a very good light for the purpose, particularly if the diaphragm be employed.—3. A nine-inch condenser is a very suitable size to use for half-plates. As a rule, better results will be obtained with daylight than with artificial, unless the source of light be a point, as in the case with the electric or the limelight. A little judgment will enable the variations in the light to be compensated for.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, May 4, 1887, will be *On Photographing Animals*.

MR. HAROLD BAKER (late H. W. Cox), Birmingham, sends us two excellent cabinet portraits of Mr. W. Jerome Harrison, for which we thank him.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday next the subject for discussion will be *The Variations of Developing Action as Tested by Spurge's Sensitometer*.

SPORTSMAN'S EXHIBITION.—At the present time there is open in "Olympia" a Sportsman's Exhibition of a very attractive nature. Here are to be found everything in which photographic amateurs are known to delight, including fishing, shooting, and boating appliances, bicycles and bicycles, together with, of course, photographic instruments. It is under the management of Mr. Harry Etherington, to whose energy the exhibition owes its success.

A SOMEWHAT clever feat was accomplished on Monday evening. At the close of the performance in the St. James's Theatre the actors arranged themselves on the stage, and were photographed by Mr. W. H. Hyslop from the front of the dress circle. The only light employed was that from the sun-burner in the roof supplemented by that from the footlights. The exposure given was the unusually rapid one of six seconds, with a lens having an aperture of $\frac{1}{8}$. The plates were orthochromatic.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION, 181, Aldersgate-street, E.C.—A special general meeting will be held on Thursday, May 5, at half-past seven p.m., to confirm or otherwise amendment of rules made by special committee. Rule 4, last clause to read, "Donors of one guinea and upwards shall be entitled to vote at general and special meetings, also at the election of pensioners, and shall further have the privilege of recommending for the consideration of the committee cases of non-members such as are defined as urgent in rule 13." Rule 10, line 15, after "applicants" insert "or cases recommended by donors under rule 4."—H. HARLAND, *Secretary*.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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PHOTOGRAPHS OF MACHINERY.

IN our recent observations upon this subject we left for further treatment sundry questions of importance which could not be sufficiently dealt with in the compass of a single article, and we now return to their further consideration. We take it for granted that no one would essay this kind of work without a complete set of lenses of various foci, all of which in turn will be found to be needed, seeing that any object may be embraced, from the smallest to the largest, from a donkey pump to a locomotive, and from that to the *coup d'œil* of a large machine shop, and from standpoints of all degrees of proximity and of distance, of convenience and inconvenience. With regard to the latter, we may say that the operator for one firm we know of, before he sets out with his camera, always dons a special suit of clothes to which he attaches little value—somewhat after the fashion of those provided for visitors to a coal mine.

We have already given the opinion of one contributor in regard to the kind of camera to use, or, rather, to avoid, that is to say the one with a free tailboard; and there is the further advice to give, that the camera be provided with double swing back. It is needed from opposing points of view—to assist in focussing and to avoid perspective representation. When the object is under extremely poor illumination, as will often happen, it will be necessary, even with dry plates, to work with a maximum aperture, and then from the cramped positions and close quarters so often inevitable, it will be found that a well-focussed image cannot be obtained without “stopping down.” Here the swing back is of marvellous usefulness; a slight deviation of the side swing will bring up into complete sharpness a most unpromising image. But it must ever be remembered that when the swing is employed for this purpose any perspective representation of lines will always be intensified. There will be cases where this will not matter and where everything must be sacrificed to the mere obtaining of a sharp image of any sort, but where there is sufficient light the swing back should never be used to facilitate focussing. Looking at the use of the swing back from the other point of view, it will be found invaluable when a picture is needed in which no perspective representation of lines is permissible, where something more of the nature of a geometrical “elevation” is required. Those not accustomed to this refinement of machine requirements may be reminded that whether the front face of the machine be presented at an angle to the axis of the lens in a vertical or horizontal azimuth, all that is needed is to make the ground-glass of the camera parallel to that face. The parallel lines of the machine then will be truly depicted as such on the plate. As this condition is just the

opposite of that needed to bring the retiring portions of the object into focus, it is evident that a small diaphragm will be absolutely essential if all parts of the machine are to be crisply depicted.

It is now no longer a secret, as it once was, how the beautifully smooth and even appearance of the surface of the machine given in some of the early photographs of this class was brought about. If this is considered essential—and that it is, or should be, is clearly shown by two photographs with smooth and with rough surfaces now before us—the machine has to be specially prepared. It must be photographed before the final coat of paint is given to it, and be specially prepared by painting in slate colour, in “flattening,” as it is termed—that is to say, the paint almost entirely diluted with turpentine, little more oil beyond that contained in the paste colour being used. Quoting again from the photographer before named, whose experience in this kind of work we know to be most extensive, he informs us that the workmen who are put to this painting need constant looking after lest they put too much oil in their paint pots, the consequence being that bright patches appear here and there, and quite spoil the effect, there being no comparison between two photographs, one from a machine with a well flattened, and the other from an imperfectly dull, surface.

In developing the negative the photographer's efforts must always be devoted to obtaining negatives as free from fog as is possible, that great enemy to clearness of shadows, a smoky atmosphere, being naturally very prevalent in shops where large numbers of workmen are constantly engaged, and where furnaces and furnace chimneys too often load the atmosphere with fine particles that are fatal to transparent shadows. In such instances it will be useless to attempt working if the sun's beams pass between camera and object, and another time of day must be chosen when this effect does not obtain. Even when this contingency can be avoided it will be found always desirable in development to use a minimum of ammonia and an unusual proportion of bromide. In fact in many cases it will be best to arrest the development at an early stage, and, instead of pushing it to full intensity of image, to obtain the needful depth by after intensification by means of mercury followed by ammonia. If hydrosulphuret of ammonia solution be employed there need be no fear of the negative fading when proper washing has been given between the various operations. We have seen large numbers of negatives so intensified years ago which have never given way, though when ordinary ammonia solution is employed there appears less certainty of permanence.

It will be found that many manufacturers require white backgrounds, and these of course can only be obtained by

painting out, which sometimes is a most laborious operation from the intricacies of the outlines presented by some machines. It will be well in such cases for the photographer to have two prices, one for machines with the workshop background, and the other for those with white ground. Paper—*i.e.* an untoned silver print—should be adopted as much as possible for stopping out, to avoid labour and loss of time, and where paint is needed for the finer details, Indian ink must be eschewed—it is too apt to split and raise the varnish. Some photographers use ordinary black varnish for the purpose, while others employ water colour (not moist colours) containing as small a quantity of gum as possible. One gentleman, who makes a speciality of machine photography, informs us that he always employs "Gihon's opaque."

We believe that we have now touched upon all the points of importance in connection with this useful kind of photography that would not at first occur to those unaccustomed to it, and we trust that our hints may be found useful to those who have any thoughts of attempting a branch of photography which is both lucrative and likely to be in increasing demand.

WE are pleased to learn, both from private sources and also from a letter in another page from the genial ex-President of the Society of New York Amateurs, Mr. F. C. Beach, that Mr. W. K. Burton, while *en route* for Japan, has been well received by the amateur section of the New York photographers. It was, of course, only politeness to the nationality of his entertainers that prompted Mr. Burton to institute a comparison between the alleged readiness displayed by the American photographer in imparting information freely to the public, and the dark contrast afforded by the alleged reluctance of the English photographer in divulging information, such comparison being seemingly to the disadvantage of the latter. The fact is that Americans have never been slow in stating how much they were indebted to the British for information openly given.

THE example set by Mr. W. H. Hyslop (with whom, by the way, we omitted to associate Mr. Lyonel Clark) of photographing the actors on the stage of the theatre by the ordinary lights employed, has been followed in a most successful manner by another member of the Camera Club. Mr. John F. Roberts has very skilfully laid siege to the Criterion Theatre, and has captured *David Garrick*, or, more correctly, the actors while taking their part in that drama. Everything is as well done as if the photography had been done by daylight in a studio. We shall next be having the courts of law, and (who knows!) even the church itself, and their inmates, falling victims to the all-conquering photographer.

It is tolerably well known that faded paper photographs may be "restored" by treating them with a solution of the bichloride of mercury. Although the prints are said to be restored, the term is really a misnomer, for no detail which has actually disappeared is recovered by the treatment; it is only the yellowness of the print which is removed, and this causes it to look bright and fresh, and, in a measure, restored. At the same time that the yellowness of the image is destroyed its former tone is changed, and rendered much warmer than it was originally. It will be interesting to learn whether pictures, after they have been renovated by the bichloride of mercury, undergo a further change, or if they can be considered permanent. This, of course, is a difficult question to answer, but we may mention that we have in our possession a number of prints which were experimented upon twenty-two years ago, and not one of them appears to have changed since. The mercurial method of renovating faded photographs was introduced about thirty years back, and it would be, as we have just intimated, desirable to know how far prints, after the bichloride treatment, will resist the action of time, and whether they may be designated "permanent." If some of the earliest examples of this system of renovating were forthcoming, they would prove instructive.

At the Astronomical Congress in Paris it has been decided to map the entire heavens by means of photography, and gelatino plates will be used for the purpose. We have seen many commercial dry plates which would yield a good display of the celestial bodies, in the shape of stars, comets, and the like, without being exposed to the sky at all. The question has often been put by the uninitiated as to how the tiny images impressed by the stars are to be distinguished from accidental spots in the bromide film. In most cases this would indeed be difficult if only one negative were taken; but the observations are never confined to a single plate, as several are always exposed. Then, by comparison, the images of the stars are easily distinguished from accidental blemishes in the film.

NOTWITHSTANDING that we have before directed attention to the fact, many photographers, who are constantly sending negatives through the post, do not appear to be aware that the Post Office now take a certain degree of responsibility in case of loss or injury to goods forwarded by Parcels Post. The liability is limited in amount to twenty shillings. But any parcel can be further insured up to the value of ten pounds for a very trifling sum. For a fee of a penny compensation to the amount of five pounds will be ensured, and for twopence to the extent of ten pounds.

To secure compensation for damage from the Post Office, the parcel must be distinctly marked with the words, "Fragile—With Care." Parcels or letters so labelled, it may be as well to mention, may be somewhat longer in transit, because the Office reserves to itself the right to select the route by which they shall travel. Such parcels, we understand, are not received by, or delivered from, trains while they are in motion, as is the case with the ordinary mail bags. Many negatives transmitted through the post are worth to their owners more than the maximum sum mentioned, but it may be somewhat doubtful if the authorities would willingly pay this amount, in the case of the breakage of a negative, unless ample proof were forthcoming of its absolute worth. In a case tried some years ago where a railway company were sued for compensation for a number of valuable negatives that were broken, their value was assessed by the Court at the cost of the glass, and a trifle in addition for the chemicals upon it.

THE *Echo*, a few evenings since, while commenting on the fact that the attitude assumed by artists towards photography has materially changed during the past twenty years, says, "The portrait painter, it is whispered, makes constant use of it to catch fleeting expressions on the sitter's face, and the landscape artist carries a camera with him on his sketching expeditions into the country." Has this not always been, more or less, the practice from the very earliest days of photography? Possibly, at that period, the painters did not, as many do now, do their own photography, but they nevertheless had it done for them. We can point to pictures executed thirty years or more ago—and which are now in our National collection—that were, to a large extent, painted from photographs. At one time a painter would consider it *infra dig* to openly recognise photography at all. But now the case is altered, and the majority of the leading artists frankly admit that photography is very valuable. A few, it is true, qualify the admission by adding for "some purposes."

ANENT the subject of backgrounds by the powder process as described last week. It may be mentioned that this method is particularly well adapted for the production of landscape or other artistic backgrounds. When these are required, some of the stock colour (see previous article) should be taken and different proportions of black or white mixed with it as occasion may require. Then the colour is moistened with water and moulded into lumps or sticks, and dried. In the dry state the sticks are used as chalks or crayons to draw or sketch on the background the design required. The sharp lines made by the crayons are afterwards softened off, by rubbing them over with the brush, or, in some cases, with a pledget of loose felt or flannel, followed by the brush. The sketch may be made on the background, either while it is wet or after it has become dry. In the latter case, however, the canvas must be wetted afterwards in order to fix the colour and prevent its eventually rubbing off. The wetting, in this instance, must be done from the back of the canvas and not from the front.

THE RIVAL PHOTOGRAPHERS.

To all who have very pronounced ideas as to what constitutes the art of photography, the following may not be altogether uninteresting. It is only by the interchange of ideas and the ventilating of experiences that a sound judgment can be formed as to the merits or demerits of any branch of art or other subject that may be open to discussion. The one, in connection of course with portraiture, that these few lines may seem to favour, has always been, but more especially of late, a kind of *bête noire* alike to the photographer and the independent artist. Notwithstanding, however, the object of their mutual revilings, if not absolute contempt, lives—I cannot say, flourishes. More than half the arguments used against him are created and carefully reared up by the revilers themselves. They have only themselves to blame, too, for the shortcomings which would never have existed had it not been for the weakness—I will not say cupidity—of those who should naturally order the situation.

In an important and wealthy town, not quite ten thousand miles from every place, there were two more or less prominent photographers. One was a man not only skilled as a manipulator in photography, but also endowed with a very great amount of artistic genius; indeed, he had been in repute as an artist (may I say *properly so called*?) long before he ever invested in a camera and lens, and dived deeply into the mysteries of the dark art (I beg pardon), photography.

Having done so, however, he went ahead conscientiously, as he considered, and laid down a theory which no one can very well upset, namely, that a photograph is a photograph, and that naturally the placing of any of the qualifying words, perfect, good, or artistic, before same would not in the least alter the conditions. There is one thing very certain, that, if being *thorough* constituted virtue, we might look upon him as the most virtuous photographer of our days.

His rival was not what we might call, strictly, an artist, but he was a very sound, practical photographer, and although he could not paint a likeness, was a very good judge of one when it was placed before him. He possessed an aptitude for posing gracefully—indeed, if we may be a little liberal to him, we may consider him an artist without the artistic training which might have enabled him to assert himself without the aid of his camera. In his ideas he was liberal to a degree; there was nothing new he would refuse a trial to, and honestly give it a fair chance of gaining favour in his eyes. Shrewd to a degree, he knew at a glance what a customer wanted, and went the best way to produce it. This will be enough to give us an idea of the two gentlemen whose dissimilar sentiments as photographers form the bases of these few lines.

It was a lovely morning in early spring, one that brings gladness to the photographic heart, one that prompts the multitude to exclaim, "What a glorious day! I'll have my photograph taken." And off they go. On such a morning some time ago a poor wretched soul, evidently not too well treated by Dame Fortune, came trudging down the street in which our rival friends had their studios. He was on the side of the artist photographer, not the photographer artist. At sight of the two show-cases on right and left of him his eye seemed to brighten, and he pulled himself upright, and, getting closer to the show-case, took a look, and thought to himself, "There is a chance here for me." He was a poor, wretched retoucher, and must really have had the sympathies of every one—that is, *every one* who was not a *photographer*.

Pulling himself together, he walked upstairs and asked to see Mr. A., and was told by the lady in attendance that he was engaged at the moment, but if he would wait, &c. "If he would wait!" it was a case of "would a duck swim?" So while he was waiting, he took a good look round. The studio was beautifully appointed, but somehow it did not look as if the entire business of the town was done there. There were some very excellent *photographs* around the room, but he marvelled in his benighted innocence that there was not one of them retouched. While he was wrapt in thought (evidently tearing his bewildered brain to know why this was thus), no doubt some moments must have passed unobserved. Suddenly a footstep was heard in the adjoining apartment which rudely brought him from "the land of dreams" to the stern reality of a photographer's studio, and a retoucher out of work.

It was no longer a question of "Why is there no retouching done here?" but "Will I get a crib?"

No sooner had he propounded to himself the latter question, than Mr. A. walked slowly, and with no small degree of majesty, into the waiting room. Somebody's blood *had* to freeze, and Mr. A.'s wouldn't. Nevertheless, advancing to our frozen friend, he most politely inquired, "May I ask why I have the pleasure of this visit, and whom I must thank for it?"

There was nothing for it but a bold front. It was the old battle-

cry of thousands before him, "Victory or—no dinner!" So summoning up all the courage he had about him at the moment, he replied, "I was passing through the town looking for work, and thought, *seeing the specimens outside*, that there might be an opening for me in your studio."

"Are you a photographer?" was Mr. A.'s only reply.

"No, I am sorry to say I am not."

"An artist, then—in oils or water colour?"

"I do not paint, but —"

"Not a photographer!!! Not an artist!!!"

I have only a small dictionary beside me, and I am unable by it to find words adequate to paint the amazement, no, bewilderment, of Mr. A., at the idea of my friend thinking there was room for such as himself. After a pause (evidently Mr. A. had failed to divine the reason why his visitor came beneath his roof) he very coldly asked, "Since you are neither able to photograph or paint, may I ask in what capacity you fancied I might require your services? What are you?"

At last the crucial moment had arrived, further disguise was useless, the dreadful truth must out. So with what courage remained (and, by-the-by, it was precious little) he confessed, "I am a retoucher!"

It is a lasting pity that there were not at least ten thousand people within eyeshot to see the smile that radiated over the countenance of Mr. A. at this damning declaration. You must not think it was one of bitter contempt—no, he would not be so cruel—it was one rather of supreme pity. I want every one to thoroughly understand that, although he would not, on any account, give him half-a-crown for retouching a large head, he would not be so mean as to deny him the pity due, by right, to a retoucher.

The shock was indeed mutual, and both were slow to recover from it, but Mr. A., reviving more quickly, resumed the conversation.

"Young man! Look around my studio. Do you see a single photograph there which has been sullied by the plumbago of a retoucher's pencil point?"

The poor devil looked around, but did not see *one* that had been retouched. All the same, though, he saw *lots* that would have been better if they had been.

"No," he replied, "there is not one that has been retouched."

"I should think not, indeed! Photography is an art, and far above the paltry help a retoucher would fain bestow upon it. Photography is truth and truth, the least interfered with, is best. I am very sorry, but really I cannot avail myself of your services. Good morning!"

Turning on his heel he went over to one of his larger photographs on an easel and fell hopelessly into an ecstasy over one of his own specimens. There was nothing left for the retoucher now but to *get out* as gracefully as he could, so wishing a polite "good morning" to the artistic photographer, he departed on his weary way, and, no doubt, through lack of appreciation, felt somewhat of a prejudice. Although I naturally take a great interest in him, I will not follow him just now, but rather pick him up later, as I know where he went on leaving. I also wish to take up my quarters at Mr. A.'s studio at least for a little while.

The lady who first received the departed visitor returned almost immediately he had left, with some work to be examined by the proprietor. While looking over it, he said, "Really, Miss S., I am astonished at the numbers of misguided men who spend their time spoiling the perfect products of the photographer. Thank heaven! I have never fallen into such errors like so many of my neighbours. What can photographers be thinking of to employ such men? What can the public be thinking of to prefer the retouched pictures to the pure and simple photograph?"

He handed her the work back and she went her way. Judging from the manner of her going, I fancy she had heard remarks of a similar nature before. Having finished his contemplation of the plain photograph, he went to his easel upon which he had an unfinished portrait in oil. But before he was many moments at work an elderly country gentleman and his daughter came in and wanted to be photographed. They were simple folk, and were somewhat over-awed by Mr. A.'s very imposing manner.

"You wish to be photographed?"

"Yes," said the father, "I and my daughter. I am not so very particular about myself, but I want a good picture of my little darling. I think I would like a large head of her as well."

"Certainly, she has very finely marked features and should make a very pretty picture."

"Yes," rejoined the proud father; "she is looked upon as the beauty of our parts. Now, Mr. Photographer, above all I want a *likeness*; none of your fashionable beauties for me, but her simple

self. She is quite beautiful enough, although I say it, perhaps, as shouldn't."

"I am an artist, sir," said Mr. A., "and the trickeries which ruin so many pictures have no place in my establishment. Truth is what I aim at. Photography pure and simple cannot err."

"That's good."

"Will you kindly step into the dressing room, and I will send for you in a moment. Your daughter can arrange her hair. She will look best with her hat off."

Father and daughter go to arrange the necessary touch-up, before the dreaded ordeal of being *shot* by the camera, and Mr. A. to see after his assistant and get the plates in readiness.

It was quite refreshing to hear this old gentleman talk. Of photography he naturally knew nothing, so we need not pay much attention to his remarks. He was a fine old fellow, however, the picture of health. His hair was almost white, his forehead very fair, and the lower portion of the face the picture of health. He had a rather strong complexion—deep and ruddy. His daughter was a most striking girl. Lovely auburn locks, to be slightly complimentary; a skin as fair as snow, but as is often the case, very badly freckled.

In fine, I must say they were two subjects that would give "fits" to a retoucher, and would try his patience and skill very considerably to do them justice. A pang of doubt might even cross the mind of the photographer who employed him as to the result. This, however, to an artist of the calibre of Mr. A., was child's play. His lens could not fail to reproduce nature as it was. There would be no risk of losing the likeness by any reckless laying on of the "retoucher's plumbago." No; it would be pure art—photographic art! as we will see when the proofs come home in the course of the next week.

REDMOND BARRETT.

(To be continued.)

CARD-MOUNTED FLEXIBLE GLASS FILMS.

[A Communication to the Birmingham Photographic Society.]

On a previous occasion I had the pleasure of drawing the attention of our members to my flexible glass films, and I then pointed out the importance which, from the earliest practice of the photographic art, had been placed on the medium carrying the negative as affecting the results.

A matter of not less importance in these days of haste and impatience is the production of a negative which will print quickly and be equally suitable for the production of either paper or glass positives, or for enlargements; these conditions are more perfectly obtained on my flexible glass films than on any semi-transparent medium.

The drawback to the use of these films has been that they were not quite ready for use, also that they were much more costly than glass. I now send the films out quite ready for use by attaching them to cards strong enough to hold the film in the camera flat and true. When it is desired to develop the latent picture the film is drawn from the card and placed in the developing dish, and treated in all respects as if it were a plate. Recent improvements have made the supporting medium free from any tendency to curl or twist in the developing or fixing processes.

Plain Mounted Film.—Here is one of the card-mounted films. I will release it from the card, and, had it been exposed in a suitable light, it would now be ready for development. The only other point requiring attention in the working of these films is the method of drying, which has always been the weak point with films. The plan which I now give has been well proved, and is in all respects satisfactory, and produces a negative as flat and true as a glass plate.

It consists simply in pasting the negative upon a stiff cardboard to dry; the card allows the paste to dry from the back. The film itself being impervious to moisture cannot be dried on a glass plate. The varnish is applied when the film is dry and before it is removed from the card.

Directions for Drying.—When the negative is washed it is placed face downwards, all moisture is removed from the back, and it is then placed on a piece of thick cardboard which has been evenly but not thickly brushed over with paste, and the negative well rubbed down to exclude bubbles; this may be done either with the hand, or a piece of paper may be laid upon it and rubbed. It is then allowed to dry, which will take ten or twelve hours. The paste used is made by mixing one ounce of flour with six ounces of water until perfectly smooth, then boil it and use when cold.

Varnishing.—This is an important point and should not be omitted, as it prevents the film curling by the gelatine surface absorbing moisture.

When the surface of the film is quite dry, apply the special varnish (cold) with a soft brush; it will dry in two or three hours. The brush should be kept soft by being placed in spirits of wine when not in use.

I have here several negatives and pictures printed on the films, some of which are at present attached to the drying cards and have been varnished and are ready for lifting; having done so, I shall then have showed the process from beginning to end.

A. PUMPHREY.

TREES AND LEAVES.

THERE is, perhaps, nothing that has more influence on the effect of the landscape than trees. Trees from the earliest periods have figured largely in pictorial compositions. The conventional tree, like a Chinese pagoda or a bunch of shavings on a pole, has gradually given way to more truthful representations, until by photography we have the most minute rendering of every bud and leaf, branch and tendril, this realistic picturing admitting no doubt of the kind and species of the tree, whether the familiar ash or the lordly cedar. In drawing and painting, trees are now rendered with fidelity to nature in the arrangement of the branches, massing of the leaves, and general effect, the impression conveyed being truthful and satisfying. It remains, however, for photography, in addition to and without impairing these qualities, to add that of infinite detail, such that no human hand could give, and without in the least destroying artistic effect, or the massing of the lights and shadows.

Trees by themselves, alone, will often make very beautiful and effective pictures, either in winter, with their bare and interlaced boughs sparkling with hoar-frost, or in summer, with their full robes of greenery, through which the sunlight flickers, changing their sober greens to emerald and gold. What variety and contrasts are continually offered to our artistic observation by masses of foliage, from the gloomy pine wood on a lowering day, to the sparkling lights on the silver beech on a summer afternoon. Trees have always been, and in all probability always will be, somewhat of a difficulty to the photographer. Many an otherwise good picture has been ruined by the movement of the leaves and branches, and I may safely say they have not always been looked upon as blessings, even in disguise. Oftentimes this blurred effect may, not unfairly, be attributed to want either of skill or patience on the part of the photographer. Trees are generally looked upon as mere accessories to the landscape, just thrown in for the sake of effect, without any further consideration. Now, I fancy, if we sometimes reversed matters and considered the trees, throwing in the landscape for effect, we should do wisely, and secure many a beautiful picture we now pass by.

The subject of trees has scarcely yet been treated exhaustively by photography, although many a treatise has been published to aid the draughtsman and the painter with sketches of the foliage and ramifications of the branches, which could be infinitely better done by photography, which would, in affording aid to others, demonstrate its own pictorial efficiency. In photographing trees and foliage it is important that the light falls in a suitable manner, and that light and dark portions are nicely contrasted; a branch strongly illuminated and clearly defined, relieved against the darker or receding portions, will at once proclaim the kind of tree it is, acting, as it were, as a key to the mass of surrounding foliage, and at the same time enhance its pictorial effect by preventing that spottiness which so often mars subjects of this kind. Unless a tree particularly lends itself to photography by its form or surroundings, the best effect is obtained without direct sunshine, this being reflected from the shiny surface of the leaves in much too strong a manner for pleasant effect, causing spots of light that require considerable care and attention to harmonise. The brighter the sunshine the longer the exposure in most cases, the reason for which is easily understood, as under such conditions the shadows become more non-aetinic, not only by stronger contrast but by the additional aid of the colour of the light transmitted through the substance of the leaves, which is, in a great measure, absent in diffused light. The contrasts being reduced by the weaker illumination, a shorter exposure may be given. Foliage, perhaps more than anything, is reduced in aetinism, if I may so express it, by a bad yellow light, so that it is much more difficult to get a proper exposure of it than of other objects under similar conditions. This opinion, is, however, subject to certain qualifications, as the kind and position of the tree has considerable influence. I should say that a tree in a bad light would require at least twice as long exposure as a building under the same circumstances, to obtain a proper amount of detail in the shadows and a good quality of negative.

I am somewhat doubtful if local colour, in the case of trees, has much effect on the results. There is no doubt that local colour on

other things has considerable photographic effect, for by comparing photographs of red sandstone and limestone it is readily noticed; but with foliage, each leaf presenting a different angle to the light, the reflection overpowers local colour. In proof of this, take a photograph of an ordinary beech or other green tree and compare it with one of a copper beech, whose leaves are deep maroon red, of a very non-actinic colour. The same exposure in good diffused light will give equal detail in each, so that it would be impossible to say from the photograph the colour of the foliage varied. The principal reason that foliage requires a somewhat longer exposure than other objects is, I take it, because of the abruptness of the lights and shadows, especially in those trees with shiny foliage, such as ivy and holly, which a long exposure harmonises. If photographing in a wood or thickly embowered lane, the conditions are similar to photographing an interior, and the exposure will be much the same; the same precautions must be taken to prevent blurring and halation as when the light comes through the windows of a building and is included in the picture—in some cases the contrasts are even more trying.

Of all trees with which I am photographically acquainted, the yew is least amenable to treatment. If such a tree occurs in a well-lighted, open landscape it will be rendered as a blot, with little or no detail, so little light is reflected from it. Some kinds of pines are difficult to render for the exactly opposite reason, tufts of light-coloured leaves standing upright reflect the light so that the effect of blurring is given; but, fortunately, neither one kind or the other very often occur in general landscape work.

The tree of all others that lends itself to the requirements of photography is the plane; the size and disposition of its leaves are very effective. The sycamore is of a very similar character. Both trees are frequently associated with buildings, rustic fences, the odds-and-ends of agricultural requirements. The elm and ash both enter largely into the composition of an English landscape, the elm being a very effective mid-distance tree, more varied in outline than most others; but for a near view the smallness and roughness of the leaves produces a somewhat indistinct and spotty effect. The branches are themselves picturesquely arranged and grow low down on the trunk.

The willow is a most effective foreground tree and flourishes in moist situations; it is usually seen by the side of rivers and water-courses, and frequently in a state of picturesque decay, the split and hollow trunks having a character entirely their own, lending themselves well to the requirements of the photographer. If we examine the cattle pieces of Lee and Cooper, and many other painters, we shall find the willow forms a very important feature in their pictures, it more than any other tree indicates the character of the ground on which it luxuriates. Meadows and streams are usually associated with it, and as is frequently the case, the soil having been washed away from its roots, the tree, or part of it, hangs over the water and is reflected in it, suggesting to the photographer the probability of an effective picture. The chief drawback is the tremulousness of the leaves and the frequency of their movements, chiefly owing to their habitat, for on the banks of streams currents of air are almost always in motion. The black alder is another of those trees to be found on river banks, and is also one of the most picturesque, growing to a good size in favourable localities, although it will dwindle to a mere bush on the uplands. The foliage is rather dark in colour, but fairly rigid, regaining its original position soon after the breeze has passed, an estimable quality photographically speaking. The branches are picturesquely arranged and are eminently suitable for tree studies. The Oak is perhaps one of the most picturesque trees of all, either with or without foliage, and seldom fails to compose well. The rigid character of the branches and short leaf-stalks are less influenced by wind than most trees, and for these reasons recommends itself to the photographer. It is a very widely distributed species, and varies greatly in dimensions according to its habitat, from that of a mere shrub to one of the largest forest trees. Bracken and herds of deer are frequently associated with it, as, like the Beech, it affords a welcome protection from sun and storm. The Beech is one of the trees, and almost the only one, that photographers have frequently made pictures of on its own account, and most are familiar with photographs of those of Burnham, both in and out of leaf, and very pleasing subjects they afford. The Elder tree, or as it is more frequently seen not more important than a bush in size, is still effective and useful photographic greenery, the foliage being distinct and characteristic; but when in flower it becomes too spotty to be very much use, the large patches of aggregated blossoms of a cream colour looking much too uniform for pictorial effect. This tree is mostly found near to dwellings or in the hedgerows of cottage gardens, and is very suitable in the composition of rustic bits.

From trees we now turn our attention to foreground plants, upon which so much of the beauty of this portion of the picture depends, and which, in many cases, will metamorphose an uninteresting into an

artistic picture. The Dock family contribute largely to this, and, take them altogether, are perhaps the most useful of this class of plants. The large, broad, bold foliage supplies good light and shade effects; the shape of the leaves and their arrangement leave little to be desired. The Hemlock and Foxglove in their season are most artistic and useful; the white umbellate inflorescence of the Hemlock often is of infinite use, its light, deeply-cut leaves standing out well from the surrounding vegetation, and may almost be said to be the making of some roadside studies. The coltsfoot is good for a light foreground, the rough, large leaves reflecting a considerable amount of light. Regarding climbing plants, the common nasturtium is perhaps best of all in cottage scenery; trained over the fence or up the plastered walls it is of a most decorative and picturesque character. The clematis is also a useful plant, trained, as it often is, over the trellised porches, and growing in wild luxuriance forms excellent subject for picture making. Foreground plants are not photographed nearly so often as they ought to be, for their own sakes, although a well chosen subject of this kind is very fascinating. The material may be commonplace and simple, but the skillful photographic rendering of them is exceedingly beautiful, and commends itself to those possessed of artistic feeling, offering opportunities of picture making often neglected. The points to be remembered are that the best effects are obtained in strong diffused light, and should be rendered on a tolerably large scale. An undoubted advantage is, such subjects are plentiful, most hedgerows supplying the necessary material.

As to ferns, they recommend themselves; a good study of them, with a few rocks or boulders, compose a picture artistic and satisfactory, with a minimum of trouble. All subjects of this kind are better taken with a long-focus single lens, and from a near point of view.

There are many other trees and plants not alluded to in this article that materially assist the photographer to make pictures, but those indicated are the principal ones to which he may specially turn his attention with a fair chance of satisfying himself and affording pleasure to others.

EDWARD DUNMORE.

UNEMPLOYED PHOTOGRAPHERS.

THE prevalence of unemployed photographers is largely connected with the subject I recently considered in these pages, of the amount of average education of the dwellers in these islands and the relative superiority of average education in the more civilised nations of Continental Europe. A passing remark was made by me that some schools, much patronised by the English, are established in Guines, not far from Calais, but I said nothing as to their quality, because I knew nothing upon that point. An anonymous correspondent has since publicly stated that he was sent to one of these schools when a boy, and that the education given therein was worthless, but that in French Government schools a good education can be had. This shows the necessity for having nothing to do with foreign private schools without careful inquiry beforehand. Within our memory, the state of education in England was once such that the man who had failed as a footman, railway porter, and dust-cart man, as a last resource took to educating British youths, after which he lived, more or less, upon the fat of the land. There is nothing to prevent such a man picking up a little French and starting an English boarding school upon the other side of the Channel. There are good private schools abroad; some are scattered in remote French agricultural districts, and are patronised by English families who know exactly what they are doing. The difference in the cost of living between England and France enables the proprietors of the schools to board and educate children at a cost not much above that of their mere keep in England, and the scholars have the advantage of learning French in the country in which it is spoken. Still, the safest plan for those who know no such schools is to take care to select one the efficiency of which is guaranteed by the imperial or local public authorities. As already stated, I think about the best place very near England in which to select some such school is Ghent. The Straits of Dover were first crossed in a balloon on the 7th of January, 1785, by Jean-Pierre Blanchard and by John Jeffries, an American. The latter was the son of the David Jeffries, Treasurer of the city of Boston; he was educated at Harvard University, and obtained his doctor's degree in Scotland at the University of Aberdeen. They crossed the Channel at a low elevation, and came down in an open glade in the Forest of Guines. The feat caused immense excitement, and the spot at which they alighted was marked by a column in their honour. This monument had been gradually much defaced, according to the natives, by French cows and by English schoolboys from Guines; it was accordingly restored two years ago, and a week later I not only met English schoolboys in the forest, but found the newly restored monu-

ment inscribed in pencil with such names as Smith, Brown, and Robinson.

Coming now to the subject of unemployed photographers, a good education in early life is one of the safeguards against want of employment; but England, as compared with some great foreign nations, being an uneducated country, we must unfortunately take the facts as we find them. Most of the unemployed persons I have met in life have been in that condition entirely through their own fault, and have in no instance been willing to admit that such is the case. Many of them have been too ignorant or too lazy to learn a skilled trade or profession, and unskilled labour naturally goes begging all the days of its life. The whole tendency of the times is to lower the demand for unskilled labourers; such persons should either make themselves skilled workmen or emigrate, to do any rough work they can get on farms on the outskirts of civilisation. The world is a great market; the man who wants employment should carry into that market some skilled labour which the world wants to buy; if he lazily enters it with unskilled labour, he has nobody to blame but himself when he finds no purchasers. Hence parents should not make ordinary clerks of their children, or put them into a trade in which they are mere counter-workers, selling to one industrious person what another skilled labourer has made; such unskilled shop-assistants can be replaced by almost any one in twenty-four hours, but a skilled worker is not usually so easy to replace. An intelligent skilled artisan who works with tools usually has a life much more free from care than a city clerk, and is in a more independent position.

A young man who intends to improve himself in some direction as hereinbefore suggested, should not consult his companions as to the wisdom of his intention; for he then appeals but to the average intellect, which always seeks to drag down any aspiring mind to its own level, and to throw cold water upon new ideas and exceptional individual exertion. In cultured society this is not so much the case.

Average photography is not now such a skilled industry as it was in the old wet-plate days; the advent of dry plates has made it much too easy, and has brought into the field also a flood of amateurs. First-rate photography is a skilled industry, and its followers are comparatively few; they are good artists, quite independently of photography; they possess technical knowledge as well, and are experienced in the ordinary routine work of the profession. Mere average photographers have not now very brilliant prospects, though there may be exceptional cases; the average assistants of average photographers are in a still worse plight, and when out of employment may not always find it easy to get into it again. Yet do they blame themselves for this? Not a bit of it. Frequently neither master nor man makes any attempt to practically educate himself in the higher stages of photography, yet he blames the world because it will not pay for half-skilled labour, of which it already has too much. Why should it buy what it does not want?

Six months' want of an engagement ought to be a blessing to a photographer's assistant who properly uses his time. He should spend several hours a-day in learning drawing, painting, and the accepted canons of art, more especially as regards posing and grouping; at the end of that time he should be skilled enough to carry out Mr. Nisbet's plan, of sketching with a bit of charcoal in a few minutes a background to suit the appearance and occupation of any particular sitter. Then let him apply for employment, and he will at once find the advantage he has gained over some less skilled competitor. As time goes on he should make himself an artistic retoucher as distinguished from a mechanical retoucher; he should teach himself optics, and the mathematics and principles of construction of lenses, and be able to test and express in accurate figures the working powers and characteristics of any lens placed in his hands. Having mastered these useful branches of his subject, at the simple expense of giving the time and buying a few second-hand books, he will find himself such a different individual, quite apart from any changes in his commercial position, as to have acquired a thirst for knowledge; he will take up other branches of self-education, and explore for himself "fresh fields and pastures new." Much the same advice may be given to his employer, who, with his income going down and his rent going up—people usually in this exceptional country not being their own landlords—has the poorhouse or emigration looming in the distance. In London, for instance, leases of business premises are getting shorter and shorter, and tradesmen are even gradually being turned into but yearly tenants, laden with enormous premiums and increases in rent; so the time seems to be approaching when nothing whatever of the fruits of their labour will go to themselves: not that they get much now—the chief Continental nations are too intelligent and well educated to permit any such system, and they are well aware of the different position of the English populace. Civil and other paid ser-

vants of the nation setting up in trade add to the acute nature of the home position, so that sooner or later a collapse of some kind is, by natural law, inevitable.

A man out of employment who does not utilise his time in making himself a skilled workman, is not alone doing no good to himself but is doing injury to others; he is in a reprehensibly false moral and religious condition, because he is living upon the industry of other people, and adding to their burdens, for he has to be kept either by his friends or by the parish. In Belgium such paupers are placed in establishments under the rule of the military, and are forced to learn a skilled trade. Some of them dislike making themselves skillful workmen so much that it is found necessary to put soldiers over them to make them work. In the end they are turned loose with much less excuse for living upon the industrious than they had when they were taken in hand by a wise government. W. H. HARRISON.

THE ASTRONOMICAL CONFERENCE AT PARIS.

THE astronomers who met together on the 16th ultimo at the invitation of the Paris Academy of Science have, after sittings extending over eight days, agreed upon a plan to be generally adopted by the various observatories which will join in the work of making a photographic chart of the heavens, with an accord that promises well for the complete success of this most valuable work.

The first meeting took place on Saturday, the 16th of April. The proceedings began by an introductory address by M. Bertrand, Secretary of the Academy of Science. M. Flourens, the Minister for Foreign Affairs, then gave an address welcoming the astronomers in the name of the French Republic. This address was responded to by M. Struve on behalf of the astronomer. The conference then proceeded to elect officers, choosing as President Admiral Mouchez, the Director of the Paris Observatory; as Acting President of the Conference, M. Struve; as Vice-Presidents, MM. Auwers, Christie, and Faye; as Secretaries, MM. Tisserand and Bakhuyzen, assisted by MM. Duner and Trépied. The Conference then took into consideration the main questions, and agreed upon them after some discussion, these main questions being briefly—1. The need of a photographic chart of the heavens; 2. The use of instruments alike in all their essential parts; 3. The extent of the work generally.

A committee was then formed to consider the kind of instrument to be employed. After considerable discussion this was decided to be an instrument identical with that already employed by the Brothers Henry in Paris, the magnitude of stars to be taken on the photographs being fixed at what is now known as the fourteenth magnitude.

After the report of this committee to the general conference, two sections—the astronomical and the astrophotographic—were formed to consider the minor questions under each head. Those sections presented their reports to the general conference on Saturday, the 23rd. They were, with some little modifications, adopted, and the conference met on Monday, the 25th, to appoint a permanent committee to direct the work while in progress. The committee named by the conference for this purpose consists of all the directors of the observatories taking part in the work, with a certain number of members not necessarily actually engaged in this work.

The conference nominated Janssen and Common as a committee to consider the application of photography to other celestial bodies not included in the scheme of a photographic chart. The exact text of the various resolutions is not yet printed, but the result of the deliberations of the conference may thus be summarised: A photographic chart of the heavens is at once to be undertaken by the various observatories which will join in the work, with instruments practically identical with that made by the Brothers Henry, but of course not necessarily made by them. The limit of the magnitude to be obtained on the plates, which are to be in duplicate, is to be that known as the fourteenth. In addition to those plates, which will require an exposure of about twenty minutes, another series of plates will be taken, with a very short exposure, in order to obtain the brighter stars with smaller discs, so as to make the exact measurement of those stars more easy. The methods of work are to be as nearly as possible the same. The minor questions, such as the extent of field to be photographed, the processes to be employed in making, developing, and preserving the plates, and all other questions of practical importance, are to be decided by the permanent committee already named.

The result of the conference is therefore a practical scheme for doing this work, and in deciding thus to follow only the results that have been proved by the Brothers Henry to be thoroughly practicable they have put the matter on a very secure footing, and have left nothing doubtful as to the actual possibility of doing the work well and, if a sufficient number of observatories join, in a very few years.

Difficulties will be met with, as they always are in such undertakings, but the conference in thus keeping clear of all experimental or unproved plans has done much to make those difficulties as small as possible.

Six observatories, four of them French, have already joined, and Chili, through its Ambassador at Paris, has declared its intention of joining; there are thus already seven observatories which will at once, when the instruments are ready, begin the work. Many of the astronomers who

attended the conference stated that, while they were unable to say definitely that their Governments would join, had little doubt that they would do so; so that now it may be considered as finally settled that we shall soon have a photographic chart of the heavens, the value of which it is quite needless to speak of. The arrangements made for the work of the conference were most complete, and reflect great credit on Admiral Mouchez and the French astronomers. The proceedings throughout the whole of the eight days during which the conference sat were marked by an amount of good feeling that is not always found in scientific gatherings. Though many of the questions were discussed with great vigour, the voting, when the matter was voted upon, was in nearly every case unanimous.

—*The Times.*

WHERE I WENT WITH THE CAMERA.

No. V.—NIJMEGEN.

NIJMEGEN was the next place of interest that I visited. This town bears upon its front the impress of antiquity. Here Charlemagne lived in 800, and at the Valkhof the remains of an old heathen chapel stands, said to have been built in 799. On the little hill where this chapel is situated a charming view of the river and town is obtained, but from a photographic point of view I found it useless, the subjects being too distant to give anything like effective pictures, and the foreground filled with foliage from the tops of the trees that grow on the hillside. The tips of stray branches of these would come in front of the lens, and yet they were growing at too great a distance to be got rid of, thus spoiling the effect of any little bits I might have managed to get. I followed the next best course, and descending to the level, took a picture of the hill and ruins from the riverside.

Coming out of a narrow street upon the market-place, I was at once thrown into the noise, and bustle, and life of the town. The centre of the market-square was filled with stalls, each loaded with fruits and flowers, the attendants wearing costumes of many hues, and bedecked with ornaments peculiar to that part of Holland from which each came, the houses on the four sides towering up six or seven storeys high, with fronts all painted and decorated. Colour, colour, colour everywhere; colour from the fruit, colour from the flowers, colour from the stall-keepers' dresses, broad patches of colour all over the house fronts filled the eye, and produced a picture brilliantly dazzling in the sunshine. I took a photograph here, but it was not very successful, for the crowds came about in hundreds before the camera was an instant up. Seeing my "fix," a young lady came out of a shop close by and told me that if I waited half an hour most of the people would be away to their work again. I had unfortunately come upon them during their dinner-hour. I thanked the young lady for her kindness, but when I got back the market was over, the sun was down, the opportunity was lost.

Going into the centre of the market-square now all was quiet, and looking up and around, I felt as if I were standing in the middle of a huge packing box with ornamental sides. There was a stage-property-profile effect about the whole arrangement that many of the streets and houses here had impressed me with. Of a far more solid type was the next place of interest I visited. Up from the market-place a short distance, in its venerable quietude, I came upon the Stad Huis, or Hotel de Ville. It had stood there stolidly holding its own, seemingly unchanged, for hundreds of years, looking down on the ever-changing groups in the living passing show that moves on continually, giving place to new men and new things, each in their turn being blotted out and forgotten.

This house with a history holds within its walls relics of every kind, gathered together out of the past, each with a story all its own, forming a chain of eventful records linked together, completing a history that can be traced back to the borders of antiquity.

Inside this house the same old man repeats that same old story day after day, until one morning he too will have passed away, when another will take up the burden of the oft-told tale, and run it during his little time, when he also will leave it to another, the house only remaining seemingly unchanged.

The collection of curiosities in this Stad Huis was the most unique and antique of any I had the pleasure of seeing during my journey. There were tapestries, old coins, banners, trade flags and badges, old armour, paintings, municipal decorations and gifts, instruments of torture; and, by the way, regarding these instruments of torture, one remarkable feature in connection with them was that in all cases they had been used for punishing women only—unruly or unfaithful wives. In these days the men must have been very, very good, for there was not one appliance on view that had been used in bringing back the erring men to the right road; hence the supposition is that they never left it. "Oh, for the good old days!"

The collection of old silver curiosities in this place was wonderful, even for a town in a country famed for its abundance of marvels in silver. In illustration of how much such collections are valued and guarded, I heard a good story on my way. I will give it you here. The young gentleman who told me the following story was a Jew, and one of the principal actors in the comedy, so he gave it in telling all the little touches that made it a very enjoyable tale:—

"Yes, sir," he said, "talking about that old silver, they put such a value upon it that money can't buy it. I remember once when I tried to

negotiate a sale. We were in that trade you see, and a gentleman called on my father one day to get his assistance in buying some old pieces of silver that he had seen and coveted. This silver was held in safe custody by the burghers in a small out-of-the-way town that shall be nameless. 'Will you come and help me to buy it?' the gentleman asked.

"I fear you will not be able to procure it," my father replied.

"Never mind," said the would-be buyer, impatiently, "let us make an attempt at any rate. I want you to go with me and negotiate."

"I am far too busy just now," my father said, with a smile and a shake of his head; "it would be quite impossible for me to go, but I'll tell you," he said, turning to me—"I was then a lad of about eighteen years of age—"little Jules there will go with you." When he saw doubt expressed in the gentleman's face, he continued, "And, believe me, he will do the business for you quite as well as I could."

"All right," said the gentleman, still looking incredulous; but he patted me on the back, and said, "Be ready to start with me to-morrow."

"Very well," I replied, and on the morrow we travelled to an out-of-the-way little town about a hundred miles away from my home.

"After the silver had been carefully examined by our client, he proposed to me to buy privately, if possible, some special lots that for pattern suited sets that he already possessed.

"I called upon the man in authority and placed my proposals before him, but I was very quickly snuffed out. 'No, no, sir; we could not sell the silver,' was the reply given in a high and mighty tone. 'It is the town's property, and dare not be touched.'

"But it is only a few pieces we want, they never would be missed."

"No matter, if it were but one piece it could not be sold."

"We will give you any price you like to name for it," I insisted.

"No price would tempt us; it's the town's property, and we cannot sell."

"So I returned to my employer and told him of my defeat.

"We knew that as a corporation they were hard up, but we did not see how we were to make any headway; however, we arranged to stay all night and see if I could resolve on any plan for the next day. We had an early visit from the custodian of the silver in the morning, and after the usual greetings he came to business at once by saying, 'I think that I see my way to get my brothers in office to part with that silver.'

"How?" exclaimed my employer eagerly.

"Well, you see, we are in want of a fever hospital for the district; if you offer to build it I will arrange that the silver is handed over to you as a small return for your kindness."

"But what would be the cost of building an hospital?" asked the would-be purchaser, dubiously.

"It would take some six or seven thousand pounds," replied our visitor, cheerfully, as if that was a sum of no moment.

"Oh, that's arrant nonsense!" replied my client with a sneer, and, turning on his heel, closed the conversation by saying, "We will think no more about it, sir."

"Our negotiations were a failure, and we left the place by the midday train.

"I had quite forgotten all about this visit for some years, when it was brought to my memory by being again called to the same town on business. This time it was to value some paintings and other articles of *vertu* in the interest of the German Government, this place in the interior having come under the jurisdiction of the Emperor.

"As I was descending from the train I caught sight of a Mr. Isaacs at the station, and he being in my own line of business I wondered what he could want there, when all at once I hit it, and said to myself, 'It's that old silver.'

"So up I goes to my friend, and without any preliminary I said, 'Look here, Isaacs, I know what you are about here. You're after that old silver. But mark what I say, you will never finger a little piece of it unless you agree to go shares with me, for I had a deal of trouble and no profit over the same thing some years ago, as you know.' I ventured to assert that he knew it, for I was sure if he was on for that silver the buyer was the same man. Isaacs only laughed and showed his teeth, but would give me no promise to share with me.

"I knew that my wealthy client sometimes employed Isaacs, so I set to tracing up their whereabouts in the town, and found that they were both staying at the same hotel. Having obtained this information I quickly set about doing my own work for the Government, which did not take me long, and then set to trace out that transaction of Isaacs'. And would you believe it, sir, the negotiations were just about closed, and the sum that was to be paid for that silver was forty thousand pounds. Oh, I was wild! Just fancy such a slip! But I determined to put a spoke in Isaacs' wheel at any rate. Without delay I telegraphed to Berlin that the corporation here were disposing of some valuable belongings to the town collection worth forty thousand pounds, and that the matter should be looked into at once. And there was a considerable commotion in the town that afternoon, I can tell you. Of course I kept in the background, and was never seen. But I had the pleasure of seeing Isaacs and my former client leaving the place next day, carelessly, though secretly, watched by Government officials, who had told them that their immediate departure would be considered necessary. And that was what Isaacs got by being too sharp, and playing down upon me so.

"The German Government bought up the silver and gave the full value for it, so my friend will never have the chance of buying it now until they

are selling off the German Empire, which won't be in our day, I fancy."

In the smoke-room of the hotel I heard this story, and it was told with all the air and sincerity of truth.

Two or three very pleasant days' work will be found for the camera in Nijmegen. After exhausting the streets, many of which are very picturesque, prominent points, such as the Belvédère, Kronenburger Park, Valkhof, &c., will be found worthy of attention. I got some good panoramic effects of the town from the other side of the river, and charming pictorial effects are to be had on the river itself all day long. Next I went on to Berlin.

MARK OUTE.

AMERICAN CORRESPONDENCE.—W. K. BURTON IN NEW YORK.

It may be of interest to many of his friends at home to learn of Mr. Burton's safe arrival here on the 16th, and of his efforts at sight-seeing. He has met with a very warm reception by both amateur and professional photographers, who are not only pleased but surprised to find in him a man of a youthful and vigorous appearance, quite practical and American in his manner. He spent an evening at our New York Society club rooms, and was agreeably surprised at the large size of the premises and the various kinds of expensive apparatus kept there for the use of members. It was all on a larger and more business-like scale than he had anticipated. He was entertained with a short exhibition of lantern slides, and found several of them were of a superior quality.

On Thursday evening, the 21st, prior to his departure for San Francisco, upon the invitation of our new and genial President, Dexter H. Walker, a few members of the Society and their friends, together with the officers, entertained Mr. Burton to an informal dinner at the St. Dennis Hotel, corner of Eleventh-street and Broadway. Every one was in the best of spirits, and as a result the evening passed very pleasantly and profitably to all concerned. Unfortunately President Walker was unable to preside because of a sudden illness, and Dr. John H. Janeway, our ex-Vice-President, was prevented from attending in consequence of a previous engagement elsewhere. Vice-President George A. Allerton presided, and Recording Secretary Daniel P. Read assisted at the opposite end of the table. Among the others present were W. I. Lincoln Adams, of the *Photographic Times*, Arthur H. Elliott, of *Anthony's Bulletin*, George H. Ripley, William M. Frisbie, Thomas T. Eckert, jun., and myself.

Several toasts were offered. Mr. Allerton and Mr. Read both heartily welcomed Mr. Burton, extending to him the good wishes of the Society. Mr. Ripley spoke of having been first interested in photography through a small item written by Mr. Burton published in the *Photographic Times*. He commended Mr. Burton's writings, was always interested in reading what he had to say, and invariably evolved from them some fact of practical value. Mr. Beach alluded also to the interest he had always had in whatever Mr. Burton wrote about, and it was the common-sense, useful character of what he said, applicable to the understanding of those looking at photography from a practical standpoint, that undoubtedly made his articles so interesting. He remarked that Mr. Burton was a member of the London Camera Club, so closely affiliated to our New York Society, and on that account he wished him a very hearty welcome, assuring him that he would have the best wishes of the Society in his journey across the continent, and to the final end of his trip to Japan. He was going from a highly civilised to a comparatively uncivilised nation, where he would no doubt exert an influence for good.

A toast of the "Photographic Press" was then responded to by Dr. Elliott and Mr. W. I. Lincoln Adams. Dr. Elliott entertained the same opinion of Mr. Burton's writings as the previous speaker; he wrote in such a way that they always liked to read it, but it was a greater pleasure to see the man and make his acquaintance.

Mr. Adams remarked that he, perhaps, had seen more of Mr. Burton than any of the others, and found in him a very genial gentleman, quite unexpectedly American in his ideas and manner. Having become personally acquainted with the author of so many articles on photographic subjects he should read his future writings with much greater interest. He wished him a pleasant journey, and he knew that all present hoped his undertaking would be successful.

Mr. Burton, in replying, could only give his sincere thanks to all for the very cordial and generous manner in which he had been treated. Everywhere he went he found American photographers very willing to assist him and give information; in this respect he thought they differed somewhat from the English photographer, who, as a rule, was quite jealous of what he knew, and endeavoured to create the impression that his knowledge was superior to any one else's. Because of this feeling he was afraid an American photographer going to England would be coolly received. He was sorry to have to confess it, but believed it would probably be the case in view of his agreeable reception here. He was struck with the small number of societies and clubs in New York. They are so plentiful in London as to enable one to attend a photographic meeting nearly every night in the week. There was in London in a majority of clubs a remarkable assimilation between the amateur and professional photographer, as well as of dealers and manufacturers of photographic materials. All were placed on an equal footing and never stopped to inquire what was the nature of their business or standing. The Camera

Club, in which he was interested, was the largest, and was intended only for amateur photographers. They had a dark room for the use of members, but all the other portions of the premises were devoted to club purposes, having convenient chairs, lounges, &c., where one could have a pleasant chat, smoke, &c. The London and Provincial Photographic Association, he thought, was the most progressive and American in its ideas; they frequently had lively discussions and jolly times. The Parent Society, he said, was quite stiff and formal; a paper was read, a few remarks made, and the meeting adjourned. While professionally he was a sanitary engineer, yet he had a peculiar fondness for photography, and he could only say about himself that he loved to write about it, and was glad to learn his articles were appreciated here. He desired to specially thank the firm who had so kindly interested themselves in his behalf while here, and closed with expressions of goodwill to all present.

It was unanimously resolved that he be proposed as an honorary member of the New York Society at its next meeting.

The entertainment closed at a late hour. It will no doubt form a pleasant remembrance to Mr. Burton when he reaches the sunny climes of Japan. All wished him God-speed and a safe journey.

New York, April 23, 1887.

F. C. BEACH.

COATING PAPER WITH EMULSION.

It stands written in a very valuable hand-book of photography in my possession, that the difficulties connected with emulsion work on paper are so many that the amateur would do well not to attempt it. Ever since reading that sentence I have been longing to prove its falseness, but until lately have never been in a position to do so, owing to want of a room in which to carry on my experiments undisturbed by the powers that rule my modest establishment.

That there are difficulties in the process I freely admit, but I also know from experience that they can be overcome by any careful, cleanly manipulator; and I gladly give my experience for the benefit of all brother amateurs who may care to profit by it, assuring them that if they will follow my directions carefully and intelligently, they will have no difficulty in turning out finished prints of their own make, from beginning to end, which will meet the demands of the most exacting, and at a fraction of the cost of the commercial article.

THE EMULSION.

No. 1.	
Gelatine (soft)	42½ grains.
Bromide of potassium	26 "
Water (distilled).....	1 ounce.
No. 2.	
Nitrate of silver	32½ grains.
Water (distilled).....	1 ounce.

Dissolve the bromide first, then add the gelatine, and dissolve by gentle heat (95° to 100° Fahr.); bring the silver solution to the same temperature, and add in a small stream to the gelatine solution, stirring vigorously, of course, in non-actinic light. Keep the mixed emulsion at a temperature of 105° Fahr. for half an hour or an hour, according to the degree of sensitiveness required, previously adding one drop of nitric acid to every five ounces of emulsion. Allow it to set, squeeze through working canvas and wash for two hours in running water. In my own practice, I manage the washing easily enough by breaking the emulsion up into an earthen jar filled with cold water, and placed in my dark room sink. A tall lamp chimney, standing in the jar immediately under the tap, conducts the fresh water to the bottom of the jar, and keeps the finely divided emulsion in constant motion; a piece of muslin, laid over the top of the jar to prevent any of the emulsion running out, completes this simple, inexpensive, but efficient washing apparatus.

The washing completed, you are ready to melt and filter the emulsion preparatory to coating the paper. When melted, and before filtering, it is well to add of glycerine and alcohol each about one-tenth of the whole bulk of the emulsion, the glycerine preventing troublesome cockling of the paper as it dries, and the alcohol preventing air-bubbles and hastening the drying. This addition made and the emulsion filtered, you are ready to coat your paper, which may be coated just as it comes from the stock dealer, plain Saxe or Rives, or, better still, given a substratum of insoluble gelatine, made as follows:—

Gelatine.....	1½ grains.
Water.....	1 ounce.

Dissolve and filter; then add eleven drops of a 1:50 filtered chrome alum solution. The paper is to be floated for half a minute on this solution, avoiding air-bubbles, and then hung up to dry in a room free from dust. The purpose of this substratum is to secure additional brilliancy in the finished prints by keeping the emulsion isolated from the surface of the paper. If you are floating the whole sheet, now is the proper time to cut it to the size you wish to coat, but for anything less than 6½ × 8½ I would recommend cutting in double or quadruple sizes, 8 × 10 for 5 × 8 and 4 × 5 prints, as the paper is easily cut down after the emulsion is dry.

COATING.

Apparatus.—A stone, marble, or glass slab large enough to hold at least half a dozen glasses of the size paper you are coating, and most accurately

levelled; a dozen or more pieces of glass of the same size as your paper; a porcelain or agateware tray of the same size; a ruby lamp; a deep tray of a size to hold your jug of emulsion and the smaller tray; a spirit or kerosene lamp enclosed in a box suitably ventilated and protected against the egress of white light from the lamp inside (this is easily secured by punching holes around the top and bottom of a tin box of suitable size and covering it with another somewhat larger in every way, but without a top); and a goodly supply of spring clothes pins, to be had of any hardware merchant for twenty cents a dozen. The above is a complete inventory of my own outfit. Having then provided yourself with these articles—with the addition of a squeegee muffled with a piece of soft flannel, an article which you can easily make by procuring a piece of small black rubber tubing of the proper length, and placing it in the centre of a strip of flannel of equal length and about two inches wide; you then fold the flannel over on itself, thus enclosing the rubber tube, and fasten the whole between two narrow, thin strips of wood, drawing the rubber up close to the wood—you are ready for coating. For this purpose, you must secure the temporary use of some small room in which the paper can be coated, hung up, and left to dry. This room must meet three requirements; it must be dry, free from dust, and capable of being made absolutely light-tight during the drying of the paper. I am fortunate enough to have undisputed control of a small attic which serves admirably. Into this room, provided with a table large enough to hold your marble slab, on which the slab is carefully levelled, you carry all the articles mentioned above. The spirit or oil lamp is placed in its box on which stands the large tray previously filled with water at 100° Fahr., and containing the jar of emulsion and the small tray filled with warm distilled water. The ruby lamp stands on a table in front of you, the glasses well cleaned and warmed to blood heat, and the paper, with the side to be coated uppermost, are placed on the table at your right; within convenient reach of your right hand stands the tray of warm water, and the levelled slab is within easy reach on your left. Turn the ruby lamp down as low as is consistent with the power of vision. Now immerse a sheet of the paper in the water in the small tray, leaving it there for a minute or two; then place it accurately on one of the glass plates, and sweep off all superfluous water with the squeegee, at the same time removing all wrinkles and air-bells, and place in an upright position to dry slightly while you prepare a second plate in the same manner. Now balance the first plate on the tips of the fingers and thumb of the left hand, and pour on a sufficient quantity of the emulsion, about one drachm for every ten square inches of paper. I use a silver soup ladle holding just enough to cover a whole-plate. Gently tilt plate from you until the further end is completely covered; then, as gently, tilt it towards you until the emulsion completely covers the paper; then carefully place it on the levelled slab to set. Continue this operation until the slab is covered, when the paper first coated will probably have become sufficiently set to be stripped from the glass and hung up by clothes pins to dry, which in my room requires from six to ten hours.

As to the exposure and development of this paper, no special directions are needed. The proper exposure with the light and negatives used will be learned by a few experiments. The developer is the usual oxalate and iron mixture, both solutions being kept slightly acid.

Negative paper is prepared in the same way, substituting a more rapid emulsion for the slow one given above.

It may be worth noting that very good matt surface prints can be made by coating ordinary drawing-paper of light or medium weight with this emulsion, but for contact printing from small negatives the results are rather coarse.

REV. W. H. BURBANK.

—*Photographic Times.*

ARCHITECTURAL PHOTOGRAPHY.

The photographing of architectural subjects in general has been rightly classed among the easier departments of our art. Given a fine building standing in a favourable position for light, and the distance at which the camera must be placed, and it will be a simple matter to treat it photographically. It will be seen, however, that, in speaking thus, we leave ourselves a large loophole to creep out of; for if we take the experience of operators who have worked in other lands, where architecture is a chief feature of the average street view, we will find that the work is often beset with trials and difficulties, and, on second thought, we can recall cases in this country where the subject has presented itself in any other but a favourable manner to the camera.

This leads us to the consideration of the first point in architectural photography—namely, the approach to the building. We believe that the great majority of subjects of this kind are best taken from the street, because the spectator is supposed to look at the building from this position. But to speak practically, it will often be impossible to carry this out, owing to crowds of people and vehicles, or to the fact of there being insufficient space around the building. This cramped-in and short approach to public edifices is even worse for the camera than for the eye of a critical observer, inasmuch as the photographer will be driven to the use of wide-angle lenses, and find his perspective lines sadly forced and unnatural. In cities and towns where the streets run at right angles, and the architectural subjects are built up close to the pavement line, it will often be quite impossible to obtain a view of the whole of even one

of the facades. Sometimes an end, with a side seen in perspective along one of the streets, may be photographed; but the question may well be asked, whether the results will be worth anything. Even for the common purposes of business advertisement, such prints will not be useful, just because the perspective, even if mathematically correct, will be false to the eye, thus making the view hardly recognisable. Any one desirous of photographing the new Post Office in Philadelphia would be met by a difficulty of this kind, while some of the handsome churches on North Broad-street, having more space in front of and around them, would be easily taken.

Whether the building is to be considered as forming a part of a street view or not will depend on the taste of the operator, and the general character of the view. Street views, as a class, will be more interesting if made instantaneously, so as to show the travel, and thus give life and animation to the picture. But when a large plate is to be used for some edifice that will arrest the attention at once, and keep it fixed, we believe that so far from any gain to the picture, there would be positive loss if many figures were introduced; and, again, an instantaneous exposure would be very apt, indeed, to leave patches of crude, black shadow without detail. An exposure long enough to leave no doubled outlines from people, waggons, &c., but only a slight streakiness over those parts of the foreground where the street was seen, would be preferable in almost every case.

Assuming that there is space enough about the building to enable the operator to take any position he pleases, the question now meets us, whether the camera should be placed near or at a distance—a wide-angle lens, of course, being necessary in the former case. If the camera be set far away, and a long-focus lens be used, the picture will have a very natural and realistic appearance, and at times may even be tame, like an architect's plan. A closer position, with a wide-angle lens, while (as we have already hinted) not being so truthful perhaps, might give a more pleasing result. Thus, there will be ample opportunity for the operator to show his good taste.

Full sunlight proceeding sufficiently from one side or the other to throw shadows from the prominent or jutting portions, will almost invariably be the most pleasing. It has been well said that shadow is the "glory of the picture," and it also serves to "explain the lights." It is just this light that can but seldom be had on those portions of a building facing the north; so that if an overcast day be waited for, in order to be able to direct the camera southwards, the details will often be finely rendered, but the picture, as a whole, will be apt to look tame and flat, if compared with those made in sunlight. A partial remedy for this will be to make the negative rather denser than usual, so as to give a vigorous print with strong contrasts. It would be well, before determining upon the work, to see the building soon after sunrise, or just before sunset, particularly in the early summer months, as there will often be a weak, though beautiful, side sunlight on the northern front, for a brief time, early and late in the day.

The outfit for architectural photography will be much the same as for landscape. A swing back will always be required, and if the camera is not square, but has to be reversed on the tripod for upright views, a double swing must be adapted, so that high church spires, &c., may be included without tilting the camera and distorting the perpendiculars. When the swing back is used, care must be given to the focussing; as it will be necessary to raise the lens panel, the centre of the defining power of the lens will, of course, be thrown down towards the foreground, leaving the tops of spires or towers in bad focus. The actual centre of the plate, or even a higher point, should then be chosen to focus upon, and a small stop be inserted to equalise the definition. The lenses used should always be rectilinear, single view lenses being seldom or never suited for this kind of work. The camera, also, should be carefully levelled in both directions, and mounted on a good, steady tripod.

All of our remarks, of course, apply to exteriors only. Interiors will be found to offer difficulties of another kind, which we cannot treat of here.

—*American Journal of Photography.*

ELLERSLIE WALLACE.

BALLOON EXPERIENCES OF A TIMID PHOTOGRAPHER.

As the season is now approaching for the ascent of balloons, and much attention is drawn at the present time to the subject of celestial photography, we have reprinted for the benefit of our readers the following graphic and interesting record of a photographer's "experiences" from our valued contemporary, *The Century*:—

MY FIRST ASCENSION.

Although I had always wished (as who has not?) to taste the pleasures of a balloon ascension, yet, when in July, 1885, Mr. A. E. Moore confided to me that he was having a large balloon built, and asked my opinion concerning the possibility of photographing from it, nothing was further from my thoughts than that I should ever realise my aspirations.

Later Mr. Moore consulted me about the construction of some parts, but still I had no suspicion that I was destined to be his companion in two ascensions.

The first ascension with the new balloon was made from Winsted on July 29; and on his return from what was to him an eventful trip, Mr. Moore proposed that I should go with him, and attempt the feat of

photographing from the balloon. This direct proposal nearly threw me into a fever; but I wished to go, and had a good degree of *theoretical* confidence in the success of the venture. After a serious consideration of the matter, I decided to accept the offer, and after this decision, which I felt to be final, went about with the emotions of a criminal whose sentence is deferred; for the day of the ascension had not been fixed. As, however, we expected to ascend soon, it became necessary to make all the photographic preparations at once; and I wrote my orders for apparatus and materials in such a condition of nervous apprehension that, to this day, I wonder that they were understood.

At length Mr. Moore came to me "with a piece of bad news," as he put it. There was to be an ascension on the 2nd of September! Upon receiving the announcement, my heart stopped for two beats, and then went on to make up for lost time.

Feeling now that I had but a week to live, my preparations and experiments were continued with great care. If a balloon was mentioned in my presence, my heart would give a fearful throb, and I could feel myself grow pale; if I glanced up at a cloud floating high overhead, the thought would instantly come, "Perhaps I may go higher than that cloud!" and I would at once grow sick and faint with the dizzying fear.

I detail the "premonitory symptoms" with such minuteness, in order to show that no one who ever thinks of making an ascension can possibly dread the experience more than I did, and to give the reader some faint idea of the revulsion of feeling which took place when the ascension was made, and I at last found myself where I had feared to be—higher than the clouds!

On awaking in the morning of September 2, I was somewhat comforted to find that a strong wind was blowing from the north-west; but on visiting the ground from which the ascension was to take place, I was shocked to discover that preparations for the inflation were already begun. I heard a gentleman say to the aeronaut, "Isn't it too windy for you to go?" and listened eagerly for his answer, which was a confirmation of my worst fears: "Oh, no; we wouldn't go if there was not wind enough to take us away from Winsted."

After partly inflating the balloon, it was decided, notwithstanding this courageous declaration, to wait awhile, and let the wind moderate if it would. At noon the wind was still strong, and to my great relief it was thought best to wait until two p.m. Two o'clock arriving found the wind apparently as fresh as ever, and after a consultation another postponement was made to four o'clock. Then, if the wind continued as strong as ever, Professor Brooks was to go alone.

During the day some of my kind friends advised me not to go; others offered to bet that I wouldn't; and some one started a story that I had backed out. These latter persons receive a large share of gratitude, as they helped materially to strengthen my resolution.

A large part of my fear was lest when once up, and too far away for retreat, my fears might serve to unfit me for the business for which alone I was to be taken from the earth.

As four o'clock approached, the inflation was resumed, and I noticed with an increase of alarm that the violence of the wind was much abated; but, after all, there was a chance that only one could go up, as the gas, which had been standing in the balloon since morning, had lost much of its buoyancy.

At last the great balloon was filled, and rounded out to its enormous proportions above the heads of the crowd. It is necessary for the passengers to take their places before the basket is attached to the netting. Moore took his place, and I was told to get my apparatus and get in; camera and plate boxes were brought from their place of storage, and I made my way back through the crowd gathered around the balloon, conscious of being very white, and moving very carefully to avoid trembling.

Even to the last moment the vague hope, which was half a fear, remained that the buoyancy of the gas might not be sufficient to carry both the aeronaut and myself. The car contained, besides its two passengers and a rather bulky amount of photographic apparatus, a large coil of rope attached to the anchor, and two bags of sand for ballast, with a frame intended to hold my camera perpendicularly over an opening which had been left in the bottom of the car for the purpose of taking views directly beneath us, and a bag containing three pigeons. Having taken our places in the car, the hoop was raised above our heads, and the cords from the balloon netting were connected with pegs attached to the hoop, which in its turn is permanently fastened to the car by cords. Those who were holding the cords from the balloon were directed to let it up, while a few men took hold of the car, to test the lifting power of the machine. In this final moment of uncertainty my breath came short, and it was hard to resist a wild impulse to separate the cords, which seemed to me like prison bars, and make my escape through the crowd.

It was quickly ascertained that the balloon had sufficient lifting power, the word was given to let go, and with a gasp I caught one deep breath, as though in preparation for a plunge into water, as with a dizzying whirl the car swung to its position under the great gas bag, and we were off!

I had looked forward with indescribable fears to the time when I should feel myself torn from the earth and lifted rapidly into the sky; but now that the time was come, how unlike was the reality to my anticipations! Instead of seeming to be carried rapidly upward, we felt as though standing at ease upon a secure support, while the crowd from the midst of which we had just started sank quickly below us, and was soon out of sight and hearing. Many things combine to make this my first ascension

more impressive and more vividly remembered than any other, though they should be counted by the hundred. On the occasion of my first ascension my emotions before starting formed a strong contrast with the experiences directly following, which did not occur in so great a degree again, as before my second ascension the distressing fears previously experienced were almost wholly absent. To complete the inflation of the balloon, and attend to the smaller details in the arrangement of the various apparatus, all of which are important when we consider that our lives are to hang literally by a thread, consume much time; so that our ascension was not begun before five p.m., when the sun had set behind the hills and the chill of gathering darkness was felt.

We were soon lifted from the gloom of deepening twilight into the full glow of light and warmth from the sun, which, as we were carried up, presented the singular effect of a sudden sunrise in the west. This change in our physical condition was paralleled, in my own case at least, by an equal change in my feelings; as we rose from darkness to light my spirits rose from a sickening fear to a wonderful sense of relief from danger. At last, turning my attention from the town we had left, and looking around I was amazed at the wonderful widening of the horizon. From the point of our departure the view was shut in on all sides by the near hills; at the next glance the Highlands and Catskills of the Hudson were in sight, while the view to the east was without limit, the eye ranging at will over stretches of hill and valley, as one might look out over the ocean.

Any person who makes a balloon ascension is sure to hear from his friends one question, many times repeated, "How did it feel?" After an earnest attempt to answer this question, I have been driven to the conclusion that the sensations of an ascension take the form of a tremendous mental impression, instead of producing any noticeable physical manifestations. In my own experience the paralyzing fear felt at starting was entirely lost before we had risen one hundred feet, being followed by the emotions of surprise and wonder, growing into a strong feeling of awe and joy, which continued through the whole time we remained in the air. All fear and dread were lost so suddenly that before we had been ten minutes from the earth I found myself wondering at the change, and trying to recall my former feelings for comparison with those of the present. As the balloon rises gradually, the many sounds of earth, striking the ear at first with confusing variety and force, grow quickly faint and distant. Soon only the loudest sound reaches us, and at last we attain an altitude which no earthly sound can reach. The only physical sensations noticed by me at any time are the ringing in the ears caused by the unbalanced pressure behind the tympanum, which may be relieved by swallowing, only to return again as the balloon is rising or falling; and, at the greater heights, a curious feeling of lightness and inclination to breathe fuller and more frequently in the rarefied air.

After our departure from the earth, and my recovery from the first impression of surprise, the rustling of the doves, our unwilling companions, attracted our attention. One of them was quickly set free, and, after circling about the car a few times, decided on the proper course, and soon disappeared in the direction of Winsted. It was at about this time that our attention was attracted to the peculiar appearance of Long Lake near Winsted. From the altitude at which we were sailing, the whole surface of the lake was in sight far below, giving us an excellent idea of the comparative size of its three bays and of the outline of its very irregular shores. The rays from the sun, still high in the west, were reflected directly to us from the surface of Third Bay, causing so bright a spot upon the rippling water that it could only be glanced at for an instant; nor was the camera's eye less dazzled than ours, for a spot of white appears upon the picture of this scene, a photographic record of the phenomenon. The race track east of the lake, so far below that the buildings were hardly visible, was apparently of about the circumference of a one-cent piece, and perfectly elliptical in shape.

Another dove was now thrown out, its actions giving us sufficient proof, were all other means lacking, of the increasing rarity of the air, as it exhibited much hesitation at leaving us. At first its wings beat the air rapidly for a short flight; then it returned to the balloon, perching upon the hoop near our heads; seeming at last to gather courage for its plunge, it spread its wings, and, describing a series of ever-widening circles, was soon out of sight far beneath us. Now as never before could I realize the great variety of lake scenery in Litchfield county. One hundred bodies of water are indicated upon a map of this county, and it seemed to us that a large proportion of them were in sight at once, either sparkling brightly, as they reflected the setting sun, or lying, dark and cool, in the shadow of the hills.

While passing directly over Shepherd's Pond, in New Hartford, Mr. Moore referred to the statements made by former aeronauts as to the ease with which the bottom of lakes and rivers might be seen; it was apparent to us that such statements should be made with caution, or some explanation should accompany them. There would seem to be only one position from which, under the proper conditions, it is possible to see objects at a considerable depth under water: the observer must be at not too great an angle with the vertical, and the water must be quite smooth. It is also necessary that the sun should be low down, so that there shall be no direct reflection of light from the surface of the water; and though in the case of a shallow pond the whole of the bottom might be seen, yet, when the body of water is of much depth, the bottom is only visible near the shore, except when the water is quite clear and the

bottom has a light hue, reflecting the light which has reached it through the water.

Having at length gained an altitude of over six thousand feet, it was decided to part with our last dove, which was accordingly dropped from the bag in which it had been confined. The singular actions and evident fear of the creature excited at once our interest and pity. Three times, after as many attempted flights, the dove returned to perch on the hoop attached to the ear, breathing rapidly, and evidently exhausted by the violence of its efforts to sustain itself in the rarefied air. At last, as we persisted in driving it away, it made another attempt at flight, which proving ineffectual, it was seen to turn and plunge directly downward with a velocity which soon carried it beyond our sight.

As we continue rising, the scene becomes every moment more impressive in its grandeur; the earth, with its network of streams and roads spread out below us, resembles a marvellously perfect map, with every variety of colour and shading. The silence is absolute, unless broken by our own actions; and the experience of being carried along without effort or consciousness of motion, over this wonderful picture, can never be forgotten. While sailing through this desert of silence, the least sound proceeding from the balloon or its occupants is startling in effect; the blood is plainly heard as it pulses through the brain; while in moments of extra excitement the beating of the heart sounds so loud as almost to constitute an interruption to our thoughts. The sound caused by a slight shifting of the gas bag inside the netting occasions frequent starts of alarm; and the cracking of the willows of which the car is woven causes an involuntary grasp at the hoop or ropes. The sensation produced by a little gust of wind, often felt upon the face while the balloon is passing from one air current to another, is weird and unearthly, and has caused me to glance in the direction from which it came, with the idea that I felt the breath of some invisible being.

At last our barometer indicated an altitude of 7200 feet, after which we began to descend slowly. From this height we enjoyed a magnificently extended view over an area much larger than the State of Connecticut. To the north, Mount Tom and other mountains of Massachusetts were in sight, as small points above the dead level of the horizon; to the east, beyond the Connecticut river, no prominent objects arrested the attention, but the landscape gradually rose up to the horizon, at the level, apparently, of the eye, showing many miles of country beyond the river; to the south lay Long Island, beyond the narrow line of light which we knew to be the Sound; while in the west, after ranging over the hills and valleys of Litchfield county, the eye rested upon the Catskills and the mountains forming the Highlands of the Hudson.

The map-like effect of the landscape is very striking. The course of streams, with the different railroads and highways, may be traced for many miles, dividing the country into irregular plots, which are again subdivided by the farms. I was pleased to see the large area of forest which still remains, notwithstanding the great amount cut for lumber and the land annually cleared by the iron manufacturers.

As our highest point had been reached, after which the balloon began to descend, we were compelled to resort to our ballast in order to remain longer at a considerable altitude. The frame mentioned as having been intended to hold my camera was first thrown out, as it was found to be unnecessary in our work; we watched it as it fell, whirling round and round until nearly out of sight.

The sunset scene was one of the most beautiful I have ever witnessed. From clear, dark blue overhead, the sky gradually shaded down into deep red in the west; and in this glorious setting of colour the sun, seeming slightly flattened, as when seen sinking at sea, blazed out a deep orange colour.

Suddenly our attention was caught by the blowing of a number of whistles; we were again within hearing distance of the earth. My first thought was, "We are getting a salute;" but we soon found that the whistling was from the factories in the many towns below us. In our position the sound of whistles from many places could reach us at once, as all were blown at the time for stopping work. At this time the trains on several railroads were in sight, and we could hear their rumbling faintly, while a surprisingly long time elapsed between our sight of a puff of steam from a locomotive and the hearing of the whistle. The balloon continued to descend, and soon we could distinguish human voices; some remarks were exchanged with the inhabitants of the farm-houses we were passing.

An interesting phenomenon observed by us, and to which I have seen no reference by other aeronauts, is the distinctness of the echo returned from the earth. When within easy shouting distance quite long sentences are returned with startling clearness; many times I was deceived into thinking that those below were mocking us by a repetition of our questions.

The order to pack the instruments caused me a feeling of deep regret that my voyage should end so quickly. Having left the ground with the greatest reluctance, I was about equally unwilling to return to it. As the balloon descended, we were rapidly nearing a hill, the western side of which was a precipice two or three hundred feet high, while its flat top was thickly wooded. Well knowing the inconvenience of a landing in the woods, Mr. Moore at once threw out the last of our ballast in the hope of clearing the trees; but the balloon sunk rapidly, and soon we could hear the rustling of the wind through the tree tops, and then the chirping of crickets. One or two sand bags were sacrificed, and Mr.

Moore was stooping to remove his shoes, when I saw that we should clear the woods, and we turned to see where the balloon would land. Not until then did we see that the land beyond the trees was on a lower level; in fact, that the east face of the hill was higher and more abrupt than the west. Our balloon cleared the trees by only a few feet, and we were then directly over the precipice. All consciousness of support from the balloon was for a moment lost; we seemed to be falling, and I was aware of gasping for breath as we sank over the edge. This impression was of short duration, yet I learned in that moment how it feels to fall from a great height.

Our confidence restored, we glanced back at the grey, lichen-covered rocks, and then down to the pasture towards which we were gently sinking; we narrowly escaped the top of a large tree, and descended to the ground so slowly that we might have gathered leaves from the tree in passing. We struck the ground so lightly that I hardly felt the shock, and then, standing in the car while the gas was escaping, I could feel the relaxation following a period of intense excitement. Soon the sound of hurrying feet was heard, and quickly a party gathered about us, all eager to help and ask questions.

JOHN G. DOUVERT.

(To be continued.)

EXPRESSION IN PORTRAITS.

STOTHARD said, "There is nothing more difficult than to paint people doing nothing." This is the daily, hourly task of the photographer, and yet he rarely seems impressed with the importance of the undertaking. In a brief forenoon, he will give you a dozen or twenty very glaring counterfeit presentments of the human face divine, and without the slightest compunction of conscience, nay, with a profound feeling of the sublimity of the occasion, write beneath his card, in beautiful scroll, "Artistic Photographer."

Did you ever stop to think that it is not sharpness or brilliancy or excellence of finish, or even softness of lighting and beauty of pose, which entitle you to this assumed title. You may have all these qualities in your work, and yet, if you have not expression, they profit you nothing for entering the kingdom of art. How shall we attain to it? you ask. Our subjects are unpoetic, lack individuality, lack expression. How shall we call forth this quality from commonplace people? We answer, this Stothard, whom we have mentioned, had the same sort of people to deal with, or he would not have given utterance to the words he did. All his work is direct from nature, not idealised. Hogarth had even more difficult subjects to deal with than you have. In Stothard's picture of the procession of "Charity Girls," he was obliged, according to the terms of the contract, to make portraits of the foremost figures, therefore to show their faces and their individuality; yet he has overcome the difficulty with wonderful skill, and the work is really one of the most original and interesting pictures he ever painted.

One sometimes fears that the principles applicable to painting are a little too high for the range of photography. Maybe they are sometimes, but the attempt to reach the high mark is healthful exercise, and the results, though they fall short, will, nevertheless, be better than if we aim not at all.

But it is not our intention to worry you with any rules of art, or to ask you to apply them to secure beauty of expression, because we do not think all the art rules in the world will give you the faculty. We desire only to call your attention to a feature in the human face, which is, as the Bible puts it, a very "unruly member." Need we say—the mouth. Beware how you try to control it. Leave it rather to its own sweet will. Every photographer has his own way of managing his sitter, but his way is generally to make the subjects as uncomfortable as possible. They have come to know this, and are generally so accommodating that they try to get in the uneasy frame of mind the minute they enter his studio. Their mouths becoming the silent utterers of their state of mind.

Of what help are the reassuring words, spoken with solemn accent: "Assume an agreeable expression"—"Try to look pleasant." This pleasant aspect becomes but a sort of mongrel smile. Most men are fortunate in the possession of a beard and moustache, which hide the photographically acquired, or congenitally inherited, defects, therefore their portraits are generally more agreeable in expression than the portraits of women. The mouth plays the most essential part in the expression. The eyes which seem to smile or look sad, in reality do nothing of the kind. The mouth is the key to interpret their feeling. The muscles which move the lips tell whether the eyes are joyous or sorrowful.

We all have seen those drawings in Bell's *Anatomy* which are so arranged that the lower half of the face can be covered with a slip, in which the mouth is a sad or laughing one, while the upper part remains the same. By this simple device we may transform a sad and saintly Madonna into a smiling nymph, in which the eyes twinkle with roguish delight. This beautiful play of the muscles of the mouth is so delicate that it at once responds to the sympathetic action of the mental condition, betrays the disposition, and so mirrors, if uncontrolled either by the will or other exciting cause, the true character of the person. Hence, the action, if natural, is involuntary, and any endeavour to govern it by the will shows at once upon the face, and we have that look of determination—that "screwing up to the sticking point" expression—which is generally

called the photographic look. Expression centres in the mouth. It is the feature for the photographer to exercise his skill upon. We are not going to give any instructions how to conquer it, because we do not know how. The action of the photographer's will would be as bad as the operation of the owner's.

The only thing which seems proper to do is to take away restraint of any kind, to relieve the model from the impression that he is the chief factor in the transaction. If some photographer would have the sense to consign his position chairs and his inquisitorial head-rest to the lumber room, there to feed oblivion with their decay, and make his operating room, not his reception room, look something like an artist's studio, it is possible the expression of his models might improve. We have seen very happy expressions in photographs, and on inquiring, found that they were taken without head-rests and without ceremony. The models were left to their own free-will, or rather they were not told when the operation began or ended.

Our plates are so very sensitive that we need no longer summon the attention of the sitter, or announce, with majestic mien, "The exposure is now about to begin." If a head is properly illuminated, less time will be required with a moderate light than when unevenly lit in a strong light, because a violent lighting gives the high lights the allopathic dose and the shadows the homœopathic.

Finally, expression is very difficult to secure; but so is everything else which is worth anything. With all thy gettings, get expression.

—*American Journal of Photography.*

JOHN BARTLETT.

MAKING ORDINARY PLATES ORTHOCHROMATIC BY BATHING WITH ERYTHROSINE.

WHEN orthochromatic methods first commanded the serious attention of practical photographers by the admirable and surprising results which were produced, there were two methods of preparation then in vogue: sensitising the emulsion for colour values by mixing with it a certain dye previous to coating the plate, and bathing the already coated emulsion plate with a colour-sensitive solution.

For the reason we have given, the latter method is the only one which has been very widely adopted in this country, and it continues to grow in favour and practical application in America, as well as abroad, while the former method is but little used.

Repeated and prolonged experiments with the various colour sensitizers have resulted in proving to our satisfaction that for the practical photographer, be he professional or amateur, erythrosine is the most effective, while it is the simplest of application. It is, moreover, so sensitive to yellow rays that with it photographing by artificial light, as gas or petroleum, becomes an easy matter.

Any photographer may make his own orthochromatic plates, and any good plate may be successfully rendered orthochromatic, by simply bathing it with the erythrosine solution. When orthochromatic plates are used for reproductions or landscape work, it is advisable to colour sensitise plates of only moderate rapidity. The formulæ are as follows:—

PRELIMINARY BATH.		
Aqua ammonia	1	drachm.
Water	7	ounces.
COLOUR BATH.		
Erythrosine.....	1½	drachms.
Aqua ammonia	2	"
Water (distilled).....	5½	ounces.

And the directions are simple.

Immerse a plate of medium sensitiveness in the preliminary bath and allow it to remain therein for three minutes. After removal, drain well, and, without washing, plunge the plate in the colouring bath, rocking it gently to secure uniform contact with the solution. The plate should not remain in the colour bath longer than seventy-five seconds, as a long continued exposure to the colour solution will depress the general sensitiveness, without increasing that for colours. If a large number of plates are prepared with the same solution, it is advisable to add, after the eighth or tenth plate, about ten or twenty drops of erythrosine. The coloured plates must be well drained, reared upon blotting-paper, and dried in the ordinary drying closet.

Coloured plates may be exposed while still wet, and the general sensitiveness is somewhat increased thereby. If, however, the object to be photographed requires a very long exposure, it is better to use a dried plate.

Developing erythrosine plates offers no serious difficulties, but it must be remembered that the plates being so sensitive to colour, especially yellow, the process must be carried on either in the shadow of a subdued ruby lantern, or a light obscured by several thicknesses of brown tissue-paper.

With the interposition of the yellow screen, which is absolutely necessary for the copying of objects in which blue and violet predominates, the time of exposure must be increased from three to six times that of an ordinary plate.

For portraiture, a more sensitive plate may be employed, but the

amount of ammonia in both baths must be reduced fifty per cent. Unless there is an abundance of blue or violet drapery the yellow screen may be dispensed with in making portraits.

—*Photographic Times.*

Department for Inexperienced Photographers.

THE FOCUS OF LENSES: BACK FOCUS—EQUIVALENT FOCUS—CONJUGATE FOCUS.

THE above terms are not only puzzling to inexperienced photographers, but are sometimes troublesome to those who have practised the art sufficiently long to be enabled to take good pictures.

Broadly speaking, the focus of a lens is that place at which rays transmitted through it are made to converge to a point. But this explanation does not cover all the ground.

The term *back focus* is an entirely misleading and unscientific one, and is useful for only one purpose, namely, to afford camera makers an idea as to what lens will suit a certain extension of camera; but as applied to any of the combinations in use it is absolutely meaningless as regards their focus. It is merely a mechanical term signifying that when any object is in focus on the ground-glass of the camera, this glass screen will be so many inches from the inner end of the lens mount. In one instance only does the back focus convey a correct idea of the real focus. This is when the objective is a single landscape one of plano-convex form, and in such a case the focus is the distance between the back or convex surface and the ground-glass.

It would serve a much more useful purpose if opticians, instead of speaking of their lenses having such or such a *back focus* (which, as we have stated, means nothing), would give the distance between the face of the flange and the ground-glass, and speak of it as the "flange focus." This, although optically absurd, would at least possess the merit of affording a ready means whether any lens in particular would be adapted for use with any definite camera.

Equivalent focus implies a certain something to which it is equivalent. It is so termed from an image formed by it equalling in dimensions that made by a single lens, such as a spectacle glass. Now, let an image be formed on the ground-glass by means of such a glass, and the size of the image—which may be a house, or a portion of a house, or even a couple of trees situated apart from each other—is a factor in ascertaining the focus of any combination of lenses. No matter if the *back focus* of the combination be, say, five inches, and the distance between the ground-glass and the simple lens, which gives an image on the ground-glass the same size as the other, be six or seven inches, the equivalent focus of the combination is precisely that, nothing more or less, of the simple spectacle glass which gives an image the same size as that obtained by the compound lens.

In most lenses of the so-called rapid class the "equivalent" focus is the distance (approximately) between the place where the stops are inserted and the ground-glass, and this place is (approximately) the optical centre of the combination. An intelligent reader will, from the foregoing, deduce the meaning of the word "equivalent," and will know that it simply means the focus of a single lens, which forms an image the same size as one of a compound nature.

Having explained so much, we now come to the question of ascertaining by other means the equivalent focus of any combination. Seeing that this series of articles is intended for the inexperienced photographer, we desire to make it as simple as possible, and shall avoid describing complex methods.

Place the camera in a window, and point it to a well-lighted scene at a distance. Focus the object, and note that there is a tree, a chimney, or a church spire at one side, the right of the ground-glass, and an equally well-marked object on the opposite side, the left. With a pair of compasses measure the distance apart of such objects, or with a pencil mark their position on the ground-glass. Now remove the lenses from the tube by unscrewing them, and insert a very small stop: a bit of card with a hole punctured in it by a thick pin will suffice. It matters not at what part of the lens mount this punctured card is inserted; indeed, it will serve the purpose equally well if the lens mount is removed altogether, and the card is placed over the flange in the camera front. Now, with a large focussing cloth thrown over the camera and the head, slide the ground-glass in or out until the feeble image formed by the pinhole corresponds in dimensions with the markings on the ground-glass previously made when the lens was in its place. Measure carefully the distance between the card and the ground-glass, and such distance is the

equivalent focus of the lens that was employed in making this experiment.

There are other and rather more complex methods by which the equivalent focus may be ascertained, but, as they have been described only lately in these pages, we refer the reader to our issue of February 11, 1887, page 84, where that will be found given with a reasonable degree of fullness.

The subject of conjugate focus will be treated of in our next.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 6076.—“Improvement in Photographic Cameras.” Complete specification. W. CLARK.—Dated April 26, 1887.

No. 6082.—“A New or Improved Camera Obscura for Use in Taking Views and the like.” S. ANDREWS and F. E. ANDREWS.—Dated April 26, 1887.

PATENTS COMPLETED.

AN IMPROVED ADJUSTABLE PHOTOGRAPHIC CAMERA STAND.

No. 6936. JOHN BROWN, Elenderry House, Shaws Bridge, Belfast.—May 24, 1886.

A SPHERE of wood or other suitable material fixed to the bottom of the camera has fitted on it three cupped or hollowed metal pieces, held against it with moderate pressure by springs, rubber bands, or both combined. Each cup has two pins pointing inwards on which the camera legs fit in the usual way, one side of the divided upper part of each leg fitting on the pin of one cup, and the other side of the leg on that of the neighbouring cup. In two of the legs the divided upper parts are held together by catches or hooks, so as to keep the cups on which they fit from separating beyond a certain distance, or this office may be performed by the springs above mentioned.

The divided upper part of the third leg has a hook with tightening screw, or else an eccentrically slotted hook or other contrivance, for the purpose of drawing the two parts and the cups on which they fit together, and thus binding the whole rigidly together and fixing the camera firmly in whatever direction it has been pointed.

The claim is: The combination of the spherical ball, with a projecting piece or pieces for the purpose of attaching the camera or other apparatus, and the sectional cups or sockets, attachable to the legs and capable of being contracted to clasp the ball as shown and described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
May 10	Great Britain	5A, Pall Mall East.
10	Newcastle-on-Tyne & N. Counties	Coll. of Physical Science, Newcastle.
10	Manchester Amateur	Masonic Hall, Cooper-st., Manchstr.
10	Derby	Sykes's Restaurant, 33, Victoria-st.
10	Bolton Club	The Studio, Chancery-lane, Bolton.
11	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
12	Birkenhead	Free Public Library, Hamilton-st.
12	Bradford Amateur	Grammar School.
12	Halifax Photographic Club	Mechanics' Hall.
12	Manchester Photo. Society	36, George-street.
12	London and Provincial	Mason's Hall, Basinghall-street.
13	Ireland	Royal College of Science, Dublin.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, April 28, at a meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. A. Haddon presided.

Mr. J. B. B. Wellington exhibited three sensitometer tablets, one belonging to himself and two to Mr. Cowan; when all three were excited by the magnesium light they gave visibly different amounts of phosphorescence, and gave different indications upon gelatino-bromide plates.

Mr. A. L. HENDERSON exhibited an advertised device for fixing a focussing cloth in windy weather; it was a bit of wire bent so as to have a hook at each end; he said that a protected shawl pin, as used by ladies, was better for the purpose and one-twelfth the price. He then produced a letter from Mr. J. D. Williams, of Holywell, saying that he was not yet ready to exhibit his new dark slide to the Association.

Mr. H. M. HASTINGS said that he had exposed platinum paper for one minute to daylight to fog it before printing, and that on developing with carbonate of potash solution cold, to which a mere trace of hypochlorite of potash had been added, it developed a clean picture; other portions of the same print otherwise developed were thoroughly fogged. Another piece of platinum paper exposed in the open air near damp blotting paper for twenty-four hours was likewise developed in the same way without fog. The amount of hypochlorite added was in proportion to the depth of the printing; in the case of fogged paper the printing had to be very deep. He thought that this information might be useful to those who had old platinotype paper which they believed to be fit only to throw away.

Mr. F. W. Cox remarked that had an ordinary short exposure been given in all probability the use of hypochlorite would merely have bleached the paper.

Mr. F. M. EDWARDS exhibited several albumenised prints spoilt by spots of different descriptions and asked the causes of the said spots.

The CHAIRMAN thought that the spots on one of the prints might have been caused by particles of soot settling thereupon, and soot being usually charged with a little sulphuric acid, sulphate of silver spots might have been formed upon the picture. When the spots on that print were examined under high magnifying power they seemed to have been produced by something which had fallen upon the paper.

Mr. HENDERSON, after operating upon the same spots with a penknife, expressed the opinion that they were due to metallic dust which had fallen upon the albumenised paper before the albumen had been dried.

Mr. HEINRICH TRINKS knew of a Continental photographer who had to copy an old engraving spotted by being worm-eaten; he covered its back with thin tissue-paper, filled up the holes with a liquid mixture of paper pulp and gelatine, and when the latter was dry continued the lines of the engraving over the spots by means of a pen charged with Indian ink.

Mr. L. Medland exhibited prints from negatives taken with drop-shutter exposures.

A question in the box asked how many brands of orthochromatic plates were in the market and what was their relative colour sensitiveness.

Mr. WELLINGTON replied that Edwards's and Obernetter's plates were in the market, and that neither of them were sensitive to the red rays. Plates dipped in cyanine blue were sensitive to the red and worked splendidly. He had found something else which worked nearly as well, but which he would not name.

Mr. EDWARDS remarked that if any one wanted to get rid of halation in photographing interiors, he could recommend plates of ground or opal glass coated with emulsion instead of coated plain glass.

Mr. WELLINGTON had found orthochromatic plates to give little halation.

A question in the box asked if common white starch were practically as good as arrowroot as a substratum in paper printing processes.

The CHAIRMAN stated that common starch contained many impurities.

Mr. W. M. ASHMAN said that under the microscope the grains of Bermuda arrowroot were seen to be tolerably even size, and he had found it to work better than common starch as a substratum.

Mr. HENDERSON would like to know if any objection existed to using as a substratum paraffine wax in such weak solution in benzole that it would not make the paper quite non-absorbent of aqueous liquids. Some such plan might be useful in making stripping films.

The meeting then resolved itself into a committee for the business purposes of the Association.

CAMERA CLUB.

AT the meeting of this Club on Thursday last week, Mr. J. Traill Taylor in the chair, Mr. LYONEL CLARK, who had been to Venezuela on business, and had taken with him a camera, gave an exceedingly interesting lecture on his journeyings. He illustrated the same by a large collection of lantern transparencies which he had made from the negatives obtained on that occasion, which included some taken at certain places he had called at in the West Indian Islands.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE monthly meeting of this Society was held on Tuesday, the 3rd instant, at the Masonic Hall,—Mr. G. W. Atkins in the chair.

Owing to an informality, the minutes could not be confirmed. The excursion to York for the following day was postponed on account of the unsettled state of the weather. Mr. Joseph Hague was elected a member.

The CHAIRMAN then rose to put the following resolution:—“That this meeting of the Sheffield Photographic Society desires to express its sincere sympathy with the President and Hon. Treasurer upon the loss which they and their families have sustained by the death of their father, the late Mr. John Yeomans, Town Clerk of Sheffield, which position he had filled for the long period of twenty-nine years, with credit to himself and to the advantage of the borough generally.”

Mr. PLATTS seconded the above in a few well-chosen words, and it was carried unanimously.

The question box was found to contain the following: “What is the best artificial light to use in making photo-micrographs by the wet process?” In answer it was stated that good work had been done with a paraffine lamp with some objects, it being merely a question of exposure, which varied with each object; indeed, some were not capable of giving a satisfactory impression upon the wet plate on account of their non-actinic colour. The magnesium light was considered available if kept strictly in the focus of the condenser.

A discussion upon detective cameras ensued, during which Mr. Barber explained the construction of two much in use in the United States. As to the lens most applicable, one of the “rapid” class was recommended where the light was good, but in such a town as Sheffield one of the small stereoscopic portrait lenses would be better, stopped down as found necessary.

Mr. BROMLEY explained the working of the due-ratio drop shutter, which was favourably commented upon.

The meeting then adjourned.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held on Thursday, the 28th ultimo, at the Royal Institution,—The President, Mr. George H. Rutter, in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were unanimously elected members of the Association:—Messrs. Richard P. Preston, Thomas Comber, J.P., William A. Caldwell and Edward Swinden.

The SECRETARY called attention to the presentation prints for last year, which were on the table, and announced that they would be distributed at Mr. Beer's office to all members applying for them who have duly paid their last year's subscription.

Mr. J. A. FORREST called attention to the serious alteration in colour of the great public buildings in our large manufacturing towns and the increasing difficulty of photographing them, giving instances of public buildings which are now impossible to photograph. He exhibited some paper negatives reproduced from old prints in his possession, from which negatives he could readily multiply prints; also some beautiful prints of the Manchester Town Hall, both interior and exterior, by Mr. Pollitt, of the Manchester Photographic Society, and advised amateur photographers to secure photographs of all such buildings whilst it was still possible.

Mr. JOHN HARGREAVES, F.R.H.S., gave a very interesting description of the objects of antiquarian and photographic interest in the Hundred of Wirral—the peninsula between the Mersey and the Dee—instancing Birkenhead, Bidston, New Brighton, Wallasea; Leasowe Castle, containing an old mantelpiece which was originally in the Star Chamber; Irly Old Hall, a black and white building, which he pronounced to be the most picturesque building in the Hundred; Thurston; Bebington, with its church, one of the most interesting ecclesiastical buildings in the district; Hooton and Poole Halls; Stanton Abbey, of which there are a few remains, but which the monks left and migrated to Whalley Abbey; and many other places of historic and artistic interest. He mentioned, in conclusion, that his paper would shortly be published in an accessible form, and might serve as a guide to those visiting the Hundred of Wirral.

A cordial vote of thanks was passed to Mr. Hargreaves for his interesting paper, and his kindness in visiting the Association to communicate information.

Mr. J. E. THORNTON exhibited his shutter, which was not ready to show at his previous visit. The shutter is similar to the well-known "Kershaw," but has an attachment by which it opens upon pressure of the pneumatic ball, and remains open as long as the pressure continues, thus providing for "time" as well as "instantaneous" exposures.

Mr. B. L. SAYCE exhibited specimens of fine dry-plate processes from 1861 to 1865, namely, 1, Bromo-iodised collodion with gelatine preservative; 2, The Fothergill process with albumen preservative; 3, The tannin and honey process; 4, Bromised collodion, sensitised in a sixty-grain nitrate bath, and coated with a solution of tannin, gallic acid, and grape sugar (by this the sensitiveness of wet collodion was obtainable in 1863 on dry plates); 5, Examples of negatives and their prints by the collodio-bromide or first practical emulsion process for negatives, introduced in September 1864. Mr. Sayce also called attention to the comparative indestructibility of negatives by the old favourite process, the collodio-albumen, and showed a print recently made from an unvarnished negative twenty-six years old, which had been stored for fifteen years in a damp outhouse, quite unprotected from the moist exhalations of its surroundings.

Mr. J. H. DAY, the leader of the first excursion of the Association this year, on Easter Monday, to Gawsorth and Marton, read a full report of the trip, abstract of which is as follows:—The first excursion of the Association took place, so far as weather was concerned, under most brilliant auspices, for a more deliciously bright, genial, sunny Easter Bank Holiday could not have been desired than was experienced by the little party of eight who started for the comparatively unknown and out-of-the-world region round about Macclesfield, with the object of opening the photographic ball of this stirring Jubilee year, 1887. The party travelled *via* Cheshire lines to Manchester, thence to London Road, and by train to Macclesfield, where a wagonette took them first to Pail Farm, thence to Siddington Church, then to Marton for the Chapel and Marton Hall, where several good pictures were obtained; thence to the old hall of the Fyttons, then back to Macclesfield. The day was a very successful one, no fewer than sixty-four plates or films being exposed.

Mr. PAUL LANGE read a brief report of the second excursion to Hooton and Toole Walls, from an analysis of which it appeared that nine members took part, that the lenses employed were two by Ross, three by Wray, one each by Swift, Newton, and Steinheil, and that forty-seven exposures were made, of which thirty-nine were on glass and eight on Eastman paper, thirty-one of the glass plates used being Ilford and eight Derwent.

Views obtained during these excursions were exhibited by Messrs. Day, Sayce, Lange, Beer, and Riley.

The proceedings closed with votes of thanks to the readers of the papers.

CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

THE members of the above Society on the 27th ultimo were indebted to Mr. D. Josti for an instructive and interesting lecture on *Retouching*.

The lecturer, who was introduced by the President, said:—Retouching, like other subjects, has an history, although the record does not extend very far back, and in its career has had to contend with varied opinions as to its utility from an art point of view; it has, however, held its place and become an important branch of photography. As a matter of fact, trading photographers cannot get along without it. Scientific photographers were its most determined enemies, and strongly objected to the original work of the camera being tampered with; there were many reasons *pro* and *con*, and I have frequently received strong censure for defending this help to artistic photography. The strongest argument against retouching is that the human eye cannot reach what the eye of the camera can, and that our hand is unable to help the precision of the lens. We must give in to this to a certain extent, but I maintain retouching is a valuable auxiliary. When retouching first took root there sprang into existence a multitude of individuals of very little artistic knowledge, but who embraced a clean and easy method of obtaining a living, and thus heavily handicapped the scientific retoucher. To aid me in making my lecture as complete as possible I endeavoured to consult some works on the subject, but not finding anything satisfactory I must rely upon my own practical experience. In the year 1852 my brother and I possessed a little studio in the Rhetic Alps, and astonished the mountaineers with Daguerreotype portraits. We received intelligence of the new and incomprehensible invention of

taking a negative. My brother immediately departed for Germany, secured the secret, returned, and catered for the new style of portrait. We were delighted with the process but somewhat disheartened on the appearance of several transparent spots, which of course spoilt our prints. Here comes my first experience of retouching; the spots were made opaque by ink and then printed fairly well. Winter came, trade was bad, I therefore migrated to Italy and joined the firm of Messrs. Bianconi, Milan, where I was struck with the splendid quality of the work turned out. I interested myself in the *modus operandi*, and found the effect produced by retouching the negative with carmine, and this could only be effected by certain artists; they not only improved the faces but added backgrounds, all backgrounds being plain in those days. I became an expert in this kind of work, and hearing it was unknown in Germany, departed to Berlin. My specimens procured me instant employment with the then leading photographer, G. Schower. Here I first found pencil retouching performed by a French artist; we exchanged ideas, and much to my advantage. The autumn came, and my carmine retouching failed to give satisfaction, the prints became spotty. The cause could not be discovered, and I was compelled to fall back on the pencil. I wrote to Italy for fresh materials, but with no better result, and eventually discovered my method would not work in a damp climate. On my arrival in England I found pencil retouching universally practised, and in many cases with very pleasing results. I cannot state who invented pencil retouching, but several Frenchmen claim the merit. Mr. Josti then gave some practical illustrations of the treatment of a head, together with some examples of fancy retouching, and concluded his address with remarks on Rembrandt and Doré pictures.

An unanimous vote of thanks was passed to Mr. Josti.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting of this Society was held at the Greyhound Hotel on Wednesday evening, April 27.—Mr. Brown in the chair.

STORING NEGATIVES.

Mr. WOLFF explained a new method of storing negatives which has three distinct advantages over the old system of grooved boxes, namely, saving of space, this method requiring but one-third the room necessary for the orthodox boxes; secondly, a particular negative can be quickly found from amongst a large number; thirdly, the cost is less than half the price of grooved boxes. The method consists simply in separating the negatives with sheets of paper cut to the exact size of the negatives, the four corners of each sheet having small triangular pieces of card glued on them to prevent the negatives pressing against each other; each dozen negatives with these intervening leaves are placed in a stout card box with hinged lid and falling front. On the back of each box is a label with spaces for number of box and names of twelve negatives.

ENLARGING ON BROMIDE PAPER.

Mr. Wolff next showed a curved support for bromide paper in making enlargements. By means of this case the bromide paper is made to take a curved form for the purpose of obtaining good definition at the ends of the paper without the use of small stops, the object being to reduce the time necessary for making the exposure. By the use of this curvature the exposure can be reduced to one-fourth or one-eighth of the time required with a small or medium stop. A developer consisting of pyro, potash, and ammonia, was described by Mr. Wolff, who showed specimen negatives and pointed out its advantages. In the use of it he first applies the bromide and pyro* to the exposed plate, next the carbonate of potash, and lastly the ammonia. Negatives thus developed have the cleanness and detail usually obtained with potash combined with the vigour given by ammonia. The chances of fogging during long development is greatly reduced by this method. Mr. Wolff showed some Eastman-Walker stripping films developed by this method which were excellent, and he particularly recommended workers using these films to try his method of development.

On Wednesday, May 11, there will be a lantern exhibition of members' slides.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting was held in the Technical Schools, Bridge-street, on the 28th ultimo.—Mr. W. J. Harrison in the chair. Forty-nine members present.

The minutes of the last meeting having been duly read and confirmed, Messrs. A. Constantine and A. W. Robinson were elected members of the Society.

A large number of photographs were exhibited by Messrs. Harold Baker, A. Bouchill, Dutton (stripping films), Harrison, Karleese, Pickard, and Thomas Taylor.

The excursion on May 7 was arranged for Lichfield, Mr. A. Pumphrey to be leader.

Mr. Nock then gave his paper on *Retouching*, remarking that too much retouching frequently spoils the picture. In many cases, even of professional work, the finished print was nothing like the person taken. For his own part, he preferred only retouching enough to relieve the shadows and soften the high lights. In cases such as freckles and people who were apt to show a contracted scowl there must be retouching; then flat pictures, by a similar method, can be made to look rounder in the features, &c. He then threw an enlarged picture (by means of the lantern) of a bad negative on to a tissue-paper screen, and proceeded to work it up by crayons, and showed how retouching should and should not be done. Some half dozen examples were very effectively altered, and the lecturer concluded by offering his practical advice at any time to the members.

Mr. PUMPHREY then read a paper on *Card-Mounted Flexible Glass Films* [see page 276].

* For pyro the Platinotype Company's preparation is used.

An animated discussion followed on both papers, and the meeting terminated with the announcement of the paper for next meeting, *Reminiscences of Photography*, by Mr. W. Osborn.

GLOUCESTER PHILOSOPHICAL SOCIETY.

PHOTOGRAPHIC SECTION.

The annual exhibition and *soirée* was held at the School of Science on Tuesday, April 26, a large number of members and friends being present, including some members of the Cheltenham Society.

The photographs on view numbered about three hundred and twenty, comprising views in Norfolk and Suffolk, by the President, G. Embrey, F.C.S.; in Norway, by J. W. Barnett; in Cornwall, by J. M. Collett; in North Wales, by F. H. Burr; in Mid Wales, by F. J. Hambly; in Derbyshire, by W. J. Jenkins; South Coast, by S. F. Morse; and many others of local interest. These were shown in the Museum, together with enlargements lent by Messrs. S. Fry & Co.; roller slide, film negatives, and bromide prints, from the Eastman Company; and apparatus by many other firms.

The lantern slides, one hundred and twenty in number, were shown in the Lecture Room at two periods of the evening by the limelight.

The President of the Philosophical Society, Rev. E. G. Penny, in moving a vote of thanks to the Section for the evening's entertainment, congratulated the members on the excellence of their work.

GERMAN PHOTOGRAPHIC SOCIETY OF NEW YORK.

On March 23, at 62, East Fourth-street, the above Society held their annual meeting, at which the election of officers took place. The following gentlemen were elected unanimously:—*President*: G. Mildemberger.—*Vice-President*: C. Buchler.—*Recording Secretary*: J. Esselborn.—*Corresponding Secretary*: G. Weing.—*Financial Secretary*: L. Schill.—*Treasurer*: G. E. Pellnitz.—*Archivers*: L. Burkhardt, G. Bilgenroth.—*Trustees*: Charles F. Kutscher, L. Nagel, and A. Baumgarten.

Correspondence.

Correspondents should never write on both sides of the paper.

THE RIGHT TO THE NEGATIVE.

To the Editors.

GENTLEMEN,—Had your correspondent, "Not a Portrait Photographer," confined himself to a fair statement of what I had written, I should not have troubled writing to you again, but, with your permission, I cannot allow him the license he has taken without demur, and would preface what I have now to say with the remark that when one correspondent, in order to make a point and prove what he may consider his argument, descends to the meanness of garbling another writer's statement, the cause he advocates must surely be a weak one.

Where have I said anything so ridiculous as "because types are 'plant,' and types may be and are used for the printing of many things, therefore they do not belong to the author;" or, "because a portrait negative can only be used for the printing of the portraits of one person, therefore it must belong to that one person—i.e., the sitter?" What I have said, and the meaning I have sought to convey is, that because authors are not usually charged with the cost of the types as types, but only for the "composition" or "setting" of them, therefore they are not entitled to their possession, and because it is the usual custom of photographers to charge the cost of the production of the negative in the charge made for finished prints, therefore the negative is undoubtedly the property of the person who has paid for its production.

Is it not a fact—I assert it is such, but am open to correction—that photographers charge in their first price for prints the cost of the glass and all the chemicals and subsequent operations necessary for the production of the negative? If they do, what are the grounds upon which their claim is made to property in the negative? It seems to me, to use a vulgar phrase, they seek to have both "the cake and the halfpenny."

I admit all "Not a Portrait Photographer" says with regard to the possibility of "cleaning the glass upon which a negative has been taken, and that the silver thereon can be recovered and utilised in the production of other negatives;" but what I would ask is, is it a commercial practice amongst portrait or any other photographers to do so? If it is not—I say it is not a commercial custom to do so, but again am open to correction—the sophistry of the argument of "Not a Portrait Photographer" is at once apparent.

As to the supposititious case your correspondent puts of a "printer having sufficient faith in the coming success of a literary effort to warrant him in stereotyping a work on the chance of being called upon to print a future edition, and because those stereotypes can only be used for the printing of that particular work that therefore they belong to the author," really, the abandoned imbecility of such a proposition does not merit serious consideration.

I am sorry "Not a Portrait Photographer" does not see the application of the ruling in *Foster v. Ward*, and gets mixed in his reference. The offer of payment for the stones is not by any means a tacit acknowledgment that the first payment does not include the right to the drawings (not negative). It is exactly the reverse. It is an assertion that the

drawings are not the property of the printers, and that the drawings being of much greater intrinsic value than the stones upon which they have been produced, the stones are equitably the property of the owner of the drawings on tender being made of the value of the stones in their clean condition.

The bearing of this ruling upon the pretensions of photographers may be seen in its full force when it is had in remembrance that a "sitter" is charged for the glass in the price paid for the prints.

As to custom in the printing trade respecting copperplates, my experience is just the opposite of "Not a Portrait Photographer."

The impertinence of the "advice," and the "superior person" tone of the first and last paragraphs of "Not a Portrait Photographer," is not commendable, and does not by any means assist his argument; however, in saying that, he will allow me to further say that I am at one with him in admiration of the meaning and practice of "*Ne sutor ultra crepidam*."—I am, yours, &c.,

G. A. RATTRAY.

28, Brown-street, Manchester.

To the Editors.

GENTLEMEN,—I am certainly not surprised at the silence of photographers generally when their claims to the ownership of portrait negatives is questioned, a claim which few would dare to uphold. That few who have written in your columns have not advanced one reason to substantiate their claim.

Mr. Barber admits that he is not a high authority, in which I assuredly agree with him, and his admission gives me some hopes for his future career.

Mr. Rattray's letter I read with pleasure. Authority or no authority, he placed the question in a fair and honest light. Mr. Rattray deserved better treatment than was given him by the writer who signed himself "Not a Portrait Photographer." Sneer is not argument, and had that writer remembered the old adage, "Example is better than precept," he would not have written the last paragraph of his letter, and in reference to which I would ask, Have the public, no matter what trade or profession they may be, no right to question an unjust claim made upon them? It is by their money portrait photographers live.

I do not say hand over the perfect negative to the client; I advocate its destruction. Let the portrait on the glass, which is not the photographer's, be destroyed, and the question of the ownership of the glass and silver film will then not be disputed. The contract would in this way be fairly and agreeably completed, the photographer paid for his work and his client supplied with the number of copies ordered.

The destruction of the negative would, in my opinion, add to the interest of the photographs. Lack of knowledge of the nature of the negative alone has allowed the custom for the photographer to retain the negative ever to exist.—I am, yours, &c.,

J. F.

Falconan-street, Newcastle-upon-Tyne, April 30, 1887.

DEAL PIER.

To the Editors.

GENTLEMEN,—The reason assigned by the Piermaster of Deal Pier to myself varied somewhat to that of your correspondent, as stated in your issue of April 22, that "The local photographers had represented to the authorities that amateurs, by photographing from the pier, were causing injury to their business—hence the impost," and cannot be correct, because at the period, now some three or four years ago, I was photographing for one of the local photographers (Mr. Berryman), and then there were but three in Deal. I offered the Piermaster the business card of Mr. Berryman and he most distinctly told me that Mr. —, another photographer, paid the authorities a fee, or else hired from them the right to take photographs from the pier, but that for half a sovereign I could go on one whole day. But at the same time it is most singular that a London publishing firm should only last week have paid, and I was also regaled with the story of the amateur's dark slides being opened and the plates spoiled by exposure to light.

It is, therefore, very evident that these two stock tales do duty very often, like the guide's story or yarn at old romantic places like Holyrood, Melrose, &c.

While there is life there is hope; and so at Deal, for right away from the pier to Walmer Castle (where the first Duke of Wellington lived the latter part of his life and where he died) are to be found any number of charming sea and shore studies.

I regret to say both Deal and Walmer Castles are disappointing from an artistic point of view. At Walmer the old doorway (portullis), drawbridge, with the moat, and half-round tower partially covered with ivy, make a picture well worth the walk from Deal.

For kypictures and cloud negatives, there are many quiet spots after passing the Barracks, and, as the high road runs along the seashore, or parallel with it, a visitor might stay on the sands all day and hardly any one pass in front of the camera. Mr. H. P. Robinson has, I know, made some of his most successful seascapes from along this piece of shore; in fact, the whole place is an haven of rest, a *dolce far niente*. "Deal is so comparatively little visited as a pleasure resort," BRITISH JOURNAL OF PHOTOGRAPHY, No. 1407.—I am, yours, &c.,

ARCHER CLARKE.

8, Suffolk-place, Wandsworth, S.W.

COLONIAL AND HOME GRIEVANCES.

To the EDITORS.

GENTLEMEN,—The letter by Mr. Cooper is interesting and useful; one must agree he has been badly treated. But why did he not return the camera as a fraud, and if not paid his money back or supplied with a perfect article, see what effect a County Court judge would have in the matter?

I think it is a capital plan to use (if so allowed) your valuable JOURNAL to expose deceptions. I have noticed the useful *G. T. C. Gazette* has done good service to cyclists in a like manner.—I am, yours, &c.,
West-End Studio, Alton. GEORGE FROST.

Exchange Column.

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

- I will give a good arguette for a view lens.—Address, W. SAUNDERS, Dickleburgh, Scole, Norfolk.
Exchange, a Ross' 12×10 view lens for a rapid rectilinear, same size.—Address, DIXON, Photographer, Colnc.
Two good Lancaster view lenses of twelve-inch focus for one of nine-inch focus by a good maker.—Address, S., 555, Battersea Park-road, S.W.
Wanted, a large roll press or grass mat and good background, for useful half-plate lens. Difference in cash.—Address, G. FROST, Alton, Hants.
Large C.-D.-V. portrait lens, by Vogel, with Waterhouse diaphragms, will exchange for landscape or group lens.—Address, Mr. ASHLEY, Photographer, 29, East-street, Hobart-street, Plymouth.
Will exchange a cabinet rolling press and silver English lever watch, value £5, for tricycle, with ball bearings, which would carry photographic outfit.—Address, D. KENNEDY, Photographer, Invergordon, N.B.
Will exchange half-plate hot rolling press, centre pressure, also changing bag to fit on tripod, chemicals, porcelain dippers, and a half-plate sliding-body camera with double dark slide; wanting, 12×10 bellows camera with screw adjustment.—Address, GREAVES, Photographer, Lutterworth.
Camera, 12×10, bellows body, twenty-four-inch focus, two dark slides for wet plates 9×7, one quite new, to take two cabinets and two C.-D.-V.'s; also one dark slide (quite new) for 9×7 double cabinet and two C.-D.-V.'s; also one 12×10 slide with carriers down to quarter-plate, in good condition. Will exchange for a Dallmeyer's 5D lens.—Address, DOIDOE & Co., 170, Union-street, Plymouth.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED:—

- W. E. DALTON, South-street, Moor, Sheffield.—Photograph of a wreath of flowers, including the words, "The Queen's Jubilee."
John Owen, Newton, Montgomeryshire.—Two photographs of the house in which the first Sunday School was held.
Thomas Ball, 7, Comberton-hill, Kidderminster.—Photograph of group of ladies in fancy costume.
T. A. Moryson, Dumfries.—Two photographs of a girl with gloves.

MECHANIC.—You are mistaken; colotype printing by machine is being practised in this country.

A. B. R.—You will find an article on the subject in the last edition of Harwich's *Photographic Chemistry*.

C. J. DOBBS.—The negative sent is very good, being sharp and clean, and well adapted to the purpose required.

MEDIUM.—The only work on the subject is that by the late Mr. Joseph Wake, but it has long since been out of print. It is quite possible that you might obtain a copy by means of an advertisement.

C. C.—White-hard varnish diluted with methylated spirit makes a fairly good varnish for negatives, but brown-hard is much better, so far as durability is concerned, but it is somewhat darker in colour.

W. W.—Under the circumstances we should advise you to make your background by the "powder process" instead of in flatted oil colour. Unbleached sheeting can be obtained at most of the linen drapers.

T. COAN.—From the behaviour of the plate it is clear there was something wrong in the development, but what it is impossible for us to say. If the solutions had been the same as mentioned a widely different result should have been obtained.

C. F. HEWETT.—Get a plano-convex lens of about ten feet focus and twelve inches in diameter. The focus of the lens must determine the height of the dome. Let the mirror exceed in size the diameter of the lens, and be half as long again as its width.

G. Y. G.—The transparencies are interesting, but as you do not say how they are produced we cannot express any opinion as to their novelty. Silver pictures toned with platinum are common enough, but perhaps yours are not produced by this method.

R. C. CURTIS.—We cannot say by simply looking at the mounting boards whether they contain anything that is likely to act injuriously on the photographs. This can only be determined by chemical analysis. Any analytical chemist will make this for you.

SEPTIMUS.—The most prolific cause of the washing away of the delicate tints of a carbon print during development is that of the tissue being in a too soluble condition. This may be avoided by keeping the tissue several days before using, or to dry it more slowly after it is sensitised. Either of these plans tends to induce insolubility.

PROFESSIONAL.—A rapid symmetrical lens will do very well indeed for taking large heads, but it will be somewhat slow for taking portraits of children. For this purpose a lens of the portrait form is far preferable. We cannot undertake to express an opinion on the cheap kinds of lenses; their merits often vary with each individual instrument.

FAIR PLAY IS A JEWEL.—This correspondent complains that a certain Company shows favouritism in supplying their customers. He says that some persons can obtain a supply of material with promptitude, while others are kept waiting, or are "left out in the cold." We do not see that we can assist our correspondent further than by sending his communication to the firm concerned, and this we have done.

NEMO says: "Will you kindly tell me the best bath and developer for easy manipulation in taking positives upon glass?"—Silver bath:—Nitrate of silver, thirty grains to the ounce of water, rendered slightly acid with nitric acid. Developer:—Water, one and a half pints; protosulphate of iron, one ounce; glacial acetic acid, one and a quarter ounces; nitric acid, half a drachm; alcohol, sufficient to cause the solution to flow over the plate easily.

W. M. L. writes as follows: "I have just built a room for the double purpose of plate making for our own requirements, and also, in the busy part of the year, a waiting room. I have lined it with match-boarding, varnished, which of course is shiny and reflects light to a certain extent. We have glazed it with a perfectly non-actinic light for plates, but find they fog. Would the still slight reflection, although the light admitted is all right, affect the plates?"—In reply: If the light admitted by the windows be perfectly non-actinic, the reflections from the walls of the room will do no harm to the plates. But in all probability the glass is not so. It must be borne in mind that a light may be so non-actinic as not to fog a plate exposed to it for a short time only, as during the development, but the case would be widely different if the exposure was several hours, as when the plates are being dried. During this period all light whatever should be excluded.

W. B. CASSINGHAM says: "I have purchased a quantity of sensitised paper from a certain firm; on opening it I found it to have a most disagreeable smell. Not having had paper perfumed before, I would like to have your opinion of it in your 'Answers to Correspondents' column; is it likely to interfere with the permanence of the prints? I have also a quantity of toning solution that I mixed up about six months ago (acetate of soda bath); I always keep a cardboard cover over the bottle, but it has gone very dark—almost black when viewed in the bottle, which holds four pints; is this right or should it remain clear?"—Opinions appear to differ as to whether paper with an offensive smell yields more fugitive prints than that prepared with fresh albumen. The general idea seems to be that there is practically no difference. With regard to the toning bath, the discoloration is due to a reduction of some of the gold—a very likely thing to occur after so long keeping. A fresh addition of gold and filtration will no doubt set it all right.

DON GUILLERMO writes: "Would you kindly give me, in your 'Answers to Correspondents,' a formula for sensitising the blue ferro-prussiate paper used for making prints and moonlight effects, and also state what is the best paper to use?"—In reply: Any fine quality of wove paper will answer. The Saxo or Rives photographic papers are as good as any that can be employed. With regard to the formula for the sensitising solution, full details for the preparation and employment of the paper will be found on page 831 of our last volume. The sensitising bath is as follows:—One ounce of red prussiate of potash is dissolved in eight ounces of water, and one ounce of ammonia citrate of iron in two and a half ounces of water; when required for use the two solutions are mixed in the proportion of one part of the iron solution to two of the potash. We cannot undertake the business mentioned in the latter portion of your communication; some of the stock dealers will no doubt carry out your instructions in the matter. We advise you to put yourself in communication with one or other of them.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—There will be an excursion on Saturday, the 7th instant, to Chingford. The train leaves Liverpool-street Station (Great Eastern Railway) at three minutes past three p.m.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, May 11, 1887, will be *On Camera Stands*. Onling at Twickenham on Saturday afternoon. Meet at Twickenham Railway Station as near to half-past two as possible.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next ordinary meeting of this Society will be held on Tuesday next, May 10, at the Gallery, 5A, Pall Mall East, when a paper by Mr. J. B. Sturge will be read, being the second part of his paper read at the February meeting.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1410. VOL. XXXIV.—MAY 13, 1887.

STELLAR AND STELLAR SPECTRA PHOTOGRAPHS.

THE Jubilee year of Her Majesty will be epoch marking in more senses than one: the spring of eighteen hundred and eighty-seven will ever stand prominent in the annals of astronomy as the period when the initiative of a completed, wide-reaching scheme of mapping the whole heavenly vaults was first taken. The great congress of astronomers collected together at the French metropolis met with the determination to work at the large idea till a thoroughly practical plan was evolved, and they have succeeded, as will be seen in the particulars which we shall presently detail.

It is to be understood that a number of observatories undertake to join hands in taking negatives of various portions of the sky—each its allotted portion—till none remains unphotographed. The results will all be tabulated, arranged, and measured so as to form a complete map, including every star up to a certain magnitude. That magnitude as now arranged is the fourteenth. This is a vast undertaking; but the labour being spread among many observatories, according to a pre-concerted scheme, there will be no great stress felt by any of the workers. It is not yet decided whether ten observatories of the United States can accept the conditions of the Conference.

We must here draw attention to a series of observations, on parallel lines, on what can only be called a gigantic scale, which are being carried on by a single observatory in the States—we allude to the photographs of spectra of stars now being produced at Harvard College as a memorial of the late Dr. Henry Draper. As at present arranged, the scheme embraces no less a project than the obtaining and cataloguing of photographs of the spectra of every "star north of -24° of the sixth magnitude and brighter, a more extensive catalogue of stars brighter than the eighth magnitude, and a detailed study of the spectra of bright stars." It is hoped that ultimately a Southern station will also be selected, so as to embrace all visible stars up to the dimension named.

The points most interesting to the photographer will naturally be the lenses and the processes—the plates. The Paris Conference has already decided upon the former, as also upon the principles governing the selection of the latter. For this star mapping refractors only are to be employed, and, after a considerable amount of discussion, it was decided that the aperture of the object glass shall be $\cdot33$ metre, and the focal length about $3\cdot43$ metres: this, our readers will observe, is about $\frac{1}{3}$. As to plates, it is decided that they should be prepared according to an identical formula to be subsequently determined, and that a "permanent control of these plates

from a point of view of their relative sensibility to the different radiations shall be instituted." So far as this information carries us, it appears to us to be an unfortunate decision. Any one who knows anything about plate making will be able to form some idea of the probability of plates prepared respectively in St. Petersburg, Paris, or the Cape of Good Hope, being in the slightest degree uniform according to the standard. We should have imagined a far better plan would have been to make the plates at one centre and despatch them to the various stations as required. The ten thousand plates spoken of would be taken in hand by any dry plate manufacturer (they would be a mere bagatelle), and uniformity guaranteed. The extent of field is to be at least one degree from the centre. There is also to be a supplemental catalogue with shorter exposures, "to assure a greater precision in the micrometrical measurement of the fundamental stars." The great usefulness of this idea will be readily perceived by the experienced photographer when he notes that while stars of the first magnitude only require an exposure of the two-hundredth part of a second, those of the fourteenth need thirteen minutes; so that the former would be exposed one hundred and fifty-six thousand times too long when the plate was exposed so as to obtain stars of the above minimum magnitudes as decided upon by the Committee. We think that they were wise in not including still fainter stars, as the sixteenth magnitude, according to the same authority—Admiral Mouchez—would need one hour and twenty minutes' exposure.

It is evident that to carry out all these plans a large number of new instruments will be required, seeing that object glasses of one particular diameter and focus only are to be made use of. "The estimated cost for each observatory, including instruments, extra assistants, plates, measurements, &c., is about four thousand pounds."

Turning now, again, to the Draper Memorial photographs, which, it will be borne in mind, are, for the northern hemisphere at any rate, to be produced at a single observatory, we find from the Report just issued, that the same rigid formality as to the lenses used is neither necessary nor useful. The first instrument used by Dr. Draper, in 1882, was simply a Voigt l ander portrait lens of two inches diameter; this was followed by one of eight inches, and Albertype engravings from the negatives are given in the plate accompanying the Report. Five minutes' exposure in each case was given, no clockwork being used to follow the star as in telescopic work generally. Provided the exposure is not too protracted the value of this is

readily seen ; the spectrum of so near an approach to a point as a stellar image is would naturally be merely a succession of bright and dark dots, but by allowing the image to move at right angles to this line of dots it becomes widened out into a ribbon as it were. In the later photographs a subsidiary arrangement to this intent is brought into play. For these spectra Dr. Draper's own eleven-inch photographic lens has been used, as also a fifteen-inch telescopic objective belonging to Harvard, and, finally, Mrs. Draper has decided to send also the twenty-eight-inch reflector and its mounting, this being the instrument with which his celebrated picture of the moon was taken. The first two instruments have been hard at work every night for several months past, and it is now intended that at least three telescopes shall be used during the whole night till the work is interrupted by daylight.

Fraunhofer's original method of producing the spectrum has been reverted to ; it consists simply in placing a prism (or prisms) before the lens. Four prisms of fifteen degrees are employed at Harvard, each being bound with brass, and fitting like a drawer into a brass cubical box, so that one prism or the whole battery at will can be placed into action. Three prisms have a face of eleven inches, one being a little smaller, and the whole box weighs upwards of a hundred pounds.

The images of the spectrum are obtained at first upon a small scale, afterwards magnified, the utmost power of the light in obtaining an original image being thus utilised, every radiation, even the feeblest, impressing itself upon the plate.

The sensitiveness of the plates has been a difficulty with the Harvard authorities. They, wisely we think, tested a series of commercial plates, and decided upon a certain brand, and afterwards, finding a still quicker mode, they now use the latter. The Report states that "apparatus for testing plates, which is believed to be much more accurate than that ordinarily employed, is in course of preparation. It is expected that a very precise determination will be made of the rapidity of the plates employed." Should this expectation be realised, photographers may perhaps be gainers.

We have now said enough to show our readers that photography, as applied to astronomical science, has, by leaps and bounds, arrived at a position which, as we stated, will make the Jubilee year an epoch in the science, and our readers will join in our wish that the utmost success may attend these parallel undertakings in both hemispheres.

FIGURES IN LANDSCAPES.

"Why is it," inquired an artist at one of our photographic exhibitions, "that good, clever photographers will persist in spoiling their landscapes by the introduction of figures inartistically posed?"

There was some good reason for the protest conveyed in this question. Several landscapes having in other respects more artistic and technical merit than are to be often seen, certainly did possess the peculiarity complained of. We all know full well that a landscape is not unfrequently greatly improved by such figures ; they impart a degree of life and character to a scene which without them might be cold and inanimate. But how few there are who seem to be capable of posing them aright. Some photographs in the exhibition alluded to came as near to perfection as can well-nigh be desired, but had their beauty clouded by obtrusive meaningless figures, introduced in the wrong place and looking in the wrong direction — more frequently towards the camera than anywhere else.

Technical photography is more easily acquired than a correct idea of art canons, and there is apt to be an abnormal straining after perfection in the former to the disregard of the latter. On attaining such perfection it is, perhaps, not unnatural that the photographer should seek to display his proficiency by submitting his works to public criticism at one or other of the numerous exhibitions now so readily accessible to the aspirant. But the public, too, are becoming alive to the fact that technical photography is not now the difficult thing it once was, and they are beginning to look in a photograph for other merits than those which are allied to the mere mechanics of the art-science.

It is by no means difficult to educate oneself in the composition of a landscape study to such an extent as shall leave no cause of animadversion for the most hypercritical of observers, and well would it be if the photographer who has acquired this degree of skill would abstain from proceeding further, as regards his public displays, until he had advanced further in his art education and mastered some of those canons of art and taste which bear upon the introduction of figure subjects which shall be in such *rapport* with the surrounding scenery as to be part and parcel of it. If it be not so, then may — nay, *will* — the whole effect of the picture be marred, like as in an otherwise perfect and complete orchestra one ill-tuned instrument acts detrimentally. But where they are properly introduced, figures are not only interesting in themselves but impart interest to a landscape. We do not here allude to subjects in which the figures form the chief theme, the landscape being merely subordinate thereto, but to pictures in which the landscape itself forms the *motif* and the figures the subordinates introduced to give sparkle and point where requisite.

This is so well expressed by Robinson in his *Pictorial Effect in Photography* that we cannot do better than give a quotation from this master in composition :—

"Before placing figures in a landscape, the artist should first make up his mind whether the composition requires the introduction of any subject to add to its completeness. If he does, do not let anything induce him to take the view without the figure, because he will be doing something that he can see could be done better with the assistance of a little more trouble ; above all, he should avoid incongruity, and never, for the sake of pleasing a friend by putting him in the picture, introduce an element of discord. The figures should look so right where they are placed that we should have no suspicion that it would be possible to place them anywhere else. . . . The figures and the landscape should never be quite equal in interest or pictorial value. The one should be subordinate to the other. The pictures should consist of figures with a landscape background (if they are represented in the open air), or of a landscape in which figures are introduced merely for the sake of impressing a point or adding life to the more important scene."

It is almost tautological to add to the foregoing the following for the special benefit of those whose love for the technics of photography has permitted them to allow their art instincts to remain as yet in abeyance. Let figures, where introduced to enhance the value of a landscape, occupy the least important and weakest part of the subject as regards its interest ; let them be placed on different levels if possible and in various and contrasting positions, and let them be subordinate to and aid the general sentiment of the landscape.

It seems impossible to many photographers to take a view embracing a country stile without placing it in the centre of the picture, and the obtrusive figure of the "friend" posed as if he or she were about to get over it.

Equally impossible does it seem to some to take a view of a river without giving an offensive prominence to the inevitable

fisherman, rod in hand. We have, however, known a good and suggestive picture having been produced by the fisher being asked to retire beyond the grasp of the lens, leaving the rod and basket on the bank to represent him.

GALLIC ACID AS AN INTENSIFIER.

RESUMING our experiments with gallic acid as an intensifier of gelatine negatives, we forsook entirely the comparatively useless formula to which we alluded in our previous article a fortnight ago. We first of all made up solutions according to the formula published by Jastrzembki some years ago, which will be found in our ALMANAC, but which for the sake of convenience we repeat here. The solutions consist of—

No. 1.

Gallic acid 1 part.
Alcohol 10 parts.

No. 2.

Nitrate of silver 1 part.
Water 16 parts.
Acetic acid $\frac{1}{4}$ to $\frac{1}{2}$ part.

For use, the gallic acid solution is diluted with about four times its volume of water, and a few drops of No. 2 then added.

This, it will be found upon calculation, forms a pretty strong solution of gallic acid as actually employed—nearly ten grains to the ounce in fact, a quantity of the acid it would be entirely impossible to detain in solution but for the alcohol. On the other hand, the proportion of restraining acid in No. 2 is remarkably small, being from seven and a half to fifteen minims of acetic acid to thirty grains of silver nitrate in each ounce of solution. The larger quantity of acetic acid if employed in conjunction with pyro would scarcely effectively prevent abnormal reduction, especially in a prolonged intensification; but with gallic acid, even though the latter be employed in strong dose, there appears little tendency to fog.

The action of this intensifier proceeds slowly, but regularly, the colour of the deposit being browner than when pyro is employed and its printing value greater. The final result is, in fact, most satisfactory, but the time occupied in the process is painfully and unpleasantly long even in comparison with pyro and silver intensification of gelatine plates, which is notoriously more prolonged than in the case of collodion. With such a liberal proportion of gallic acid to the ounce of solution one would at least imagine there would be greater energy, and we were at first at a loss to account for the extreme slowness of action, until it struck us that possibly the presence of a large proportion of alcohol (a total of twenty per cent.) might have something to do with the result. As our readers are well aware, alcohol has a powerful hardening action upon gelatine, especially in the moist state, and not only refuses to allow itself to be absorbed into the gelatine, but prevents the absorption of water, and when strong actually extracts the latter.

A feasible explanation of the slowness was found in the possibility that the combined hardening effects of the gallic acid and alcohol, together with the counteraction of the alcohol against the absorption of the solution by the film, was the real cause of the retarded intensification. Another troublesome effect of the alcohol is to be found in its tendency to cause uneven action, owing to the "greasy" manner in which the solution flows over the film when the latter has been previously damped, or when the negative is washed after the

intensification is complete. For these reasons, therefore, we determined to try the effect of an aqueous intensifier.

In this case it is impossible to employ a solution of anything like the same strength as that of Jastrzembki, for, as is well known to old paper or albumen process workers, gallic acid is only soluble to the extent of about three grains to the ounce of cold water, though much more so as the temperature rises. We suspected, however, that this strength might prove quite as effective as the higher quantity when the check action of the alcohol and the stronger hardening effect of the ten-grain solution were removed, and in this, as will be seen subsequently, we were not far wrong. If, however, a stronger solution be required without the introduction of alcohol, the addition of a little glycerine will increase the solubility of the gallic acid though not to the same extent as alcohol. The glycerine has also another beneficial action, inasmuch as it increases instead of diminishing the penetrating power of the solution, and so goes far to help the intensifying process; and, lastly, as we shall show in our description of the method of manipulation, by increasing the fluent properties of the solution it enables the operation to be performed without the aid of a dish, an advantage the importance of which will be pointed out.

The solutions we employed were as follows:—

No. 1.

Gallic acid 20 grains.
Glycerine 1 ounce.
Water 5 ounces.

No. 2.

Silver nitrate 120 grains.
Citric acid 30 "
Nitric acid 30 minims.
Water 4 ounces.

Dissolve the gallic acid in the water, hot, add the glycerine, and when quite cold filter. The glycerine we employed is a cheap foreign sample, costing something like tenpence a pound retail, absolute purity being apparently a matter of no moment. For various reasons we prefer citric acid to acetic acid, one of the chief being that it is a more stable substance and of uniform strength. The nitric acid we invariably use with silver intensification on account of its special action in keeping the intensifying solution clear and preventing deposit. In case of a preference for acidifying the gallic acid solution—a practice which some prefer since it enables the operator, by applying it to the plate before adding the silver, to neutralise any traces of alkali left from the developer—the following modified formula may be employed, the solutions being—

No. 1.

Gallic acid 20 grains.
Citric acid 2 to 3 "
Glycerine 1 ounce.
Water 5 ounces.

No. 2.

Silver nitrate 120 grains.
Nitric acid 30 minims.
Water 4 ounces.

If it be desired to use acetic acid instead of the citric, the former may be substituted in the proportion of about fifteen minims of the "glacial" acid for each half grain of citric acid; or, say, two ounces in the first formula, and from one drachm to a drachm and a half in the second.

As we have already hinted, upon testing this modification, although only one-third the strength of Jastrzembki's, it

proved to be not only as powerful in action, but more rapid. Though, perhaps, not so quick in its effects as pyro under similar circumstances, the difference is not great, certainly not sufficiently so to forbid the substitution of gallic acid should it prove to possess other advantages, which we think it does. One of these is a greater freedom from tendency to stain the film after prolonged application, as pyro frequently does, though it must be borne in mind that the stain so produced, if not partially due to unremoved hypo, is more readily got rid of by alum and hydrochloric acid than that which results from alkaline pyro. Another apparent advantage consists in the better colour usually obtained with gallic acid, and the greater density obtained. When pyro is employed, for some reason or other the negative will occasionally refuse to gain density, however long the application may be continued, or in spite of the quantity of silver added. This we have never noticed in connection with gallic acid, for, though the action may in some cases be exceptionally slow, the effect, if gradual, is always certain. As in the case of pyro intensification, the density invariably increases on drying the negative, a fact which should always be held in view.

Allusion has been made to the desirability of dispensing with the use of a dish in intensifying, and this the presence of the glycerine, by causing the solution to flow readily over the usually somewhat repellent gelatine surface, enables us to do. The gain is in the direction of economy, as a couple of drachms of solution will answer for a half-plate, when with the dish as many ounces would be required, meaning the expenditure of eight times the quantity of material, besides which the back of the plate does not require freeing afterwards from the deposited silver.

In using it, from three to five minims of solution No. 2 are added to each drachm of No. 1, poured on to the film, and kept in motion until the necessary strength is obtained, after which the plate is well washed, then soaked for a few minutes in a strong solution of common salt or iodide of potassium to remove any traces of free silver, and finally again washed before drying.

At the last meeting of the Quekett Microscopical Club, a paper upon a new photo-micrographic camera was read by Mr. E. M. Nelson, which was of a rather notable character, seeing that he claimed for his invention that it was "not a makeshift which is only capable of doing fairly good work, but it is proved by practical experience to be equal to the highest class of work;" and this, too, notwithstanding the fact that "the whole of the apparatus, namely, camera, microscope, lamp, is produced at a cost less than is usually paid for a camera alone." As far as we can gather, the chief point of novelty about the new arrangement is the employment of the Zeiss projection eye-piece in lieu of the ordinary eye-piece. The camera itself is simple and neat, and adds one more excellent form to the list of existing useful patterns familiar to workers in this direction. It consists of two cardboard tubes, one sliding into the other, and the junction protected by a velvet flap; the wider tube is attached to an upright board with an aperture, behind which are placed grooves to receive ground-glass or dark slide, metal slides being recommended. This upright board is attached to a baseboard which holds the microscope (to be placed horizontally) and the lamp. The fine adjustment is worked by a string passing first over a long rod placed at the side of the baseboard, then over the head of the adjustment screw, and, finally, over a pulley on the other side of the board.

It is thus seen that a neat and simple arrangement, which any one can make for himself, is here indicated. The advantage of using an eye-piece is undoubted in the direction of convenience; and if this new eye-piece prove to possess decided advantages over the ordinary

form, it is highly probable that photo-micrographic work in future will not be produced by the objective alone. For those whose space is limited there is great convenience in its use, from the distance between ground-glass and object being restricted to such narrow limits.

We have had considerable experience in this kind of photography, and the conclusion we came to at an early date was that the chief secret of success lay in the illumination of the object to be photographed. In microscopic work generally the same remark may be made, and we unhesitatingly say that no one is likely to succeed in photo-micrography in various directions, unless he have some experience with the requirements, and the possible varieties, of microscopic illumination. We observed that at a recent meeting of the Royal Microscopical Society, one of the Fellows exhibited some photo-micrographs as the result of an alteration of the illumination, in the direction of cutting off superfluous light by means of a sliding diaphragm. With regard to this, we must say that in all projections, whether lantern or microscopic, the nearer the illuminant is reduced to a point (a form of expression exchangeable with "cutting off superfluous light") the more delicate and sharp does the definition become.

We referred lately to the indefiniteness of popular nomenclature in the case of the carbonates of soda, and also to the possibility of change taking place in the substance itself, and in a recent number of the *Comptes Rendus* of the Paris Academy of Science allusion is made to a singular property of one of the many forms of this substance. The author of the observation, M. Paul de Mondésir, has observed that sodium carbonate if combined with a single equivalent of water absorbs carbonic acid extremely slowly, if at all, at ordinary temperatures, while if it be mixed with a small quantity of bicarbonate the reaction sets in at once, and with an energy proportionate to the quantity of the bicarbonate present. It is evident that this monohydrated salt would be a most useful one for the photographer, as there would be little liability to fluctuations of strength, although if it were used it would be necessary to remember that an allowance would need to be made in the formulæ employed for the increased strength of the new in proportion to the more usual forms of the salt.

We believe that owing to the uncertainty we allude to, the number of photographers using the "bicarbonate"—*i.e.*, the hydrogen sodium carbonate—for developing is by no means few. It is, of course, impossible to tell what proportion, if any, of neutral carbonate, which would facilitate the development, is contained in their samples; but it is not difficult to ascertain whether any of the latter be present or not. If a little rosolic acid be added to a concentrated solution of the bicarbonate, no change will be perceived even after the lapse of a quarter of an hour; but if from one to four parts in a hundred of neutral carbonate be present a rose tint is quickly produced; when a still larger quantity is present the colour becomes more of a purple.

THE NEWCASTLE-ON-TYNE PHOTOGRAPHIC EXHIBITION.

In the Jubilee Exhibition which was opened in Newcastle-on-Tyne, on Wednesday, there is a very imposing and attractive Fine Art Section, and a really excellent Photographic Section. In this latter there are sixty-four exhibitors (of whom twenty-four are amateurs), the total number of frames being a little over three hundred. Although situated so far north, yet do our Scottish brethren seem to have held aloof, there being, so far as we can perceive, only three exhibitors from the Northern Kingdom. The pictures, whether landscape, portrait, or *genre*, are all of a high class. The gentlemen selected to act as judges of the awards included as one of their number a local professional artist of recognised ability, Mr. H. H. Emmerson, President of the Bewick Club.

To one who has visited other photographic exhibitions of a past period, many of the photographs will be familiar as old acquaintances, but there are also many which we have not met with before, and which appear here for the first time.

Among the exhibitors of portraits are Anernum & Son, Bruce, W. Winter, Werner & Son, Mendelssohn, Lafayette, Byrne, Brnton,

Parry, Spencer, Chaffin, P. H. Emerson, Hingloy, Hogg, Thompson & McLeish—names the most of which are associated with high art excellence.

In landscape work the collection is very rich. J. P. Gibson's series, *An Autumn Evening on the South Tyne* (140), and others by the same artist are above average. M. Auty, too, shows good work. J. Pike has a fine display, including well executed views of old buildings in Newcastle. The exhibits of Harry Tolley arrest attention; several of them have been taken in the attractive dells of Derbyshire. The subjects in the landscape department are of varied a type as can be desired, for we find Norwegian and Welsh mountain scenery (by Ellerbeck), Norfolk scenery (by Emerson), hanging in happy proximity to Jesmond Towers, Derwentwater, Cornish, Yorkshire, Surrey, and other county scenery. P. M. Laws & Son exhibit a frame of well executed ceramic enamels, the only specimen of photo-mechanical work in the Exhibition, a careful piece of photo-lithography being contributed by the same firm. One sees, with much pleasure, the technically perfect views of Spanish interiors by A. Pringle. W. H. Geddes & Son have effective snow scenes.

There are none among the local photographers who will not be gratified at being afforded an opportunity of examining the *Dawn and Sunset* of H. P. Robinson, the *Water Rats* of F. M. Sutcliffe, *West's Yachts*, and other photographs of celebrity of which they have read or heard.

The display by local photographers is most creditable, and is such as to show that they need not fear competition by outsiders. In regard to either artistic or technical qualities, Newcastle and the surrounding country produce photographers of which the whole fraternity may be justly proud.

The following are the medal awards:—

JUDGES' AWARDS.

Class I. Series of six portraits.—J. Lafayette, Dublin, gold medal; H. S. Mendelssohn, London, silver medal; Werner & Son, Dublin, special mention.

Class II. Series of six landscapes.—H. Tolley, Nottingham, gold medal; Paul Lange, Liverpool, silver medal; J. P. Gibson, Hexham, special bronze medal; F. M. Sutcliffe, Whitby, special mention.

Class III. Single landscape or marine.—H. R. Procter, Tynemouth, silver medal (landscape); J. Pike, Newcastle, special bronze medal (marine).

Class IV. Figure.—F. M. Sutcliffe, Whitby, silver medal.

Class V. *Genre*.—F. M. Sutcliffe, Whitby, silver medal; A. Diston, Leven, Fife, special mention; A. Donald, Dundee, special mention.

Class VI. Ceramics.—P. M. Laws & Son, Newcastle, silver medal.

Class VII. Enlargements.—M. Auty, Tynemouth, silver medal; J. H. T. Ellerbeck, Liverpool, bronze medal.

Class VIII. Instantaneous.—H. Symonds, silver medal; E. W. Habene, M.D., London, bronze medal.

Class IX. Architectural.—J. Pike, Newcastle, silver medal.

Class X. Interiors.—W. Parry, South Shields, silver medal.

Class XI. Photo-mechanical.—P. M. Laws & Son, silver medal.

Class XII. Amateur.—P. Lange, Liverpool.

On the suggestion of the Jurors a special bronze medal was awarded to Mr. Adam Diston by the Council for his picture, *The Smithy*.

THE ABC OF PHOTOGRAPHIC EMULSIONS.

[A Communication to the North London Photographic Society.]

HAVING chosen as the title upon which to base my remarks "The ABC of Photographic Emulsions," I do not need at the outset to explain that my object is not so much to demonstrate to you any process of practical emulsion making as to explain the general principles which are common to every process, and give a general outline of manipulations necessary for their production.

Let us first decide upon what we mean by a photographic emulsion. Every schoolboy knows that the word emulsion is derived from the participle of the Latin verb *emulgere*, "to milk out;" and the dictionary definition of it will be found to run thus: "Any milk-like mixture prepared by uniting oil and water by means of another substance, saccharine or mucilaginous." It is obvious, however, that this definition will not apply to an emulsion in a photographic sense. In this sense a more correct definition would be: "A viscous fluid holding in suspension a substance in a fine state of division."

As an example, let us suppose that a quantity of a substance in fine powder—common whiting for instance—be stirred into a glass of water. At first we should have a mixture having all the appearance of an emulsion, but in a short time the particles of chalk would

subside, leaving the water clear. If, however, instead of water, a solution of gum or gelatine were used, the chalk would be held in suspension for a considerable time. This would be, from a photographic point of view, an emulsion, though of course it would not be a sensitive emulsion.

Sensitive emulsions usually consist of bromide, iodide, or chloride of silver, or a mixture of them, suspended in a solution of gelatine or in collodion. These three haloid salts of silver have many characteristics in common, and are usually produced by the admixture of a solution of one of the soluble bromides, iodides, or chlorides, such as those of ammonium or potassium, and a solution of nitrate of silver.

As an example, I will take a solution of bromide of potassium and add to it a solution of nitrate of silver. That a chemical change has taken place is at once evident. The insoluble bromide of silver will quickly find its way to the bottom of the vessel, leaving the other resultants of the double decomposition in solution. [The lecturer here explained the equation,



For most purposes it is necessary that the soluble nitrate should be removed. In the present case this may be effected by simply washing the silver bromide in a few changes of water. If after this treatment we add the silver bromide to a solution of gelatine, we have a gelatino-bromide emulsion.

An emulsion made exactly in the way I have demonstrated would not be found to be a satisfactory one, for reasons which I shall explain hereafter; but there are several practical processes in which the silver bromide is obtained as a precipitate, washed, and emulsified. These are known as precipitation processes.

It is one of the laws of chemical combination that the same compound invariably contains the same constituents and in the same proportions. The same compound, however, may exist in forms physically very widely different; Derbyshire spar, marble, and chalk, for instance, are all carbonate of lime, but in different molecular conditions. In the same way the silver haloids may exist in different molecular forms, the particular form in which they appear being governed in the first place by the conditions under which they are produced, the original state, however, being amenable to alteration by after treatment in a variety of ways. It is to this fact we owe the power of producing emulsions which differ in sensitiveness and in other important particulars.

In the last experiment the silver bromide was formed very rapidly and in very coarse particles. It has, however, been generally agreed that, although certain desirable qualities in an emulsion are only present when the silver haloid is in apparently coarse particles, this condition must be the result of after treatment, and that the silver haloid must, in the first place, be produced in a finely divided state. One of the factors in producing this fine division is the rapidity with which the particles are formed, and a little consideration will make it evident that the viscosity of the fluid in which they are formed will exercise a powerful influence in this direction. There are, besides, other factors, all of which it is of the utmost importance to take into consideration in practical work, such as the presence, during the formation of the haloid, of an excess of the silver salt or of the bromide salt, the acidity or alkalinity of the solutions, the temperature at which the mixture is made, and the method of mixing the various constituents.

As an experiment I will now proceed to make a small quantity of emulsion by the following formula:—

Bromide of potassium	15 grains (14+1),
Nitrate of silver	20 "
Gelatine	20 "

to one ounce of emulsion.

It is not, however, to be understood that this formula, or that the method I am about to adopt in this experiment, is to be recommended for practical work. It is, in fact, one of the earliest published, dating from long before dry plates of the sensitiveness of those of to-day existed, except in the visions of enthusiasts.

We have here twenty grains of nitrate of silver. To convert the silver of this into bromide will require fourteen grains of bromide of potassium; there is, therefore, an excess of one grain of bromide of potassium. I may here mention that collodion emulsions may be made in which there is an excess of silver nitrate, but this is not practicable with gelatine, as a chemical combination is entered into between the silver and the gelatine producing fog.

Following the course usually pursued, having soaked the gelatine in cold water, I dissolve it and the potassium bromide in a portion of the water, using the remaining portion to dissolve the silver nitrate. The silver solution is now to be added to the gelatine and bromide solution in small quantities at a time, thoroughly shaking or stirring

after each addition. This and all subsequent operations should, of course, be performed in the dark room.

We have now silver bromide in a fine state of division suspended in a solution of gelatine. We have also the other product of the double decomposition, nitrate of potass, and the slight excess of bromide of potassium. If finished in its present state this emulsion would be found to be very slow, not more sensitive than an ordinary wet plate, but by further treatment its sensitiveness can be marvellously increased. We will, however, leave the question of sensitiveness for the time, and complete this emulsion. In the previous experiment we got rid of the superfluous nitrate salt by the very simple method of washing the bromide of silver in several changes of water. We have now entirely different conditions to deal with. The silver bromide, instead of falling to the bottom of the vessel, is held in suspension. However, by taking advantage of that curious property of the solid colloidal bodies of allowing crystalloids, when in solution, to pass through them, that is to say, by the process known as dialysis, we have an almost equally simple means of attaining the same end. All that is necessary is to allow the emulsion to set, and then to soak it for a sufficient time in water. As a matter of convenience and a saving of time, it is usual to separate the set emulsion into fine threads, or divide it into small particles. Another method, which is extremely useful under some circumstances, is based upon the affinity of alcohol for water. The fluid emulsion is poured into a quantity of methylated spirits, which abstracts from it the water, together with the soluble salts, the gelatine and bromide of silver being precipitated. In this case, of course, as the emulsion is left practically without water, a sufficient quantity must be added before remelting.

The emulsion being washed, is remelted and filtered. It is then ready for coating plates. After remelting, additions are sometimes made, such as a small quantity of alcohol, which causes the emulsion to flow more freely, antiseptics to enable it to be kept without decomposing, or chrome alum to prevent any tendency to frilling; but these are matters of detail which do not come within our present province.

We have now to take into consideration some of the conditions which govern the sensitiveness of emulsions, and here we are entering a region where conjectures are more plentiful than established facts. It is still a matter of controversy whether under any circumstances there is a chemical combination between the gelatine and the silver, or whether the gelatine acts simply mechanically in holding the silver haloid in suspension. We need not, however, enter into this matter here. We know that sensitiveness is dependent—to a very great extent, indeed, if not wholly dependent—upon the molecular condition of the silver. We know that this molecular condition may be altered or modified by various methods of treatment, and we also know that the extent to which the condition of the molecules can be modified is dependent upon their condition at formation. In the emulsion I have made the molecules of silver bromide are arranged in very fine particles. This we can determine by the colour of the light transmitted through a film of it being ruby or orange. We can, however, in several ways obtain a rearrangement of these molecules into particles of larger size, and it will be found within certain limitations that as the size of the particles is increased the sensitiveness of the emulsion is also increased. Every variation may be traced by observing the colour of the light transmitted through a film of the emulsion, it appearing ruby, orange, purple, blue, or grey, as the particles increase in size. The colour by reflected light being affected to some, but far less, extent. [The lecturer demonstrated this change in colour by passing round plates coated with emulsion at the various stages.]

The earliest method of treating a gelatine emulsion to increase its sensitiveness was that published in 1878 by Mr. C. Bennett. Having made an emulsion in a manner similar to that just shown Mr. Bennett kept it fluid and warm for several days by means of a water bath at a temperature of 90° Fahr. He found that the sensitiveness increased under this treatment for about seven days, when the maximum was reached. This process, by which Mr. Bennett produced plates far exceeding in rapidity any that had previously been produced, was, however, a very tedious one, and we are indebted to Mr. W. B. Bolton for having, shortly afterwards, published a method by which similar results are obtained in a much more direct manner. Mr. Bolton made his emulsion with a portion only of the gelatine, and boiled it, the bulk of the gelatine being subsequently added. He thus obtained, within an hour at the most, the same result that with Mr. Bennett's method required several days. There was also in this process the advantage that the greater portion of the gelatine had been subjected to the least possible destructive influence; for there is no doubt that either keeping gelatine in a liquid state or raising it to a high temperature will result in a portion of it becoming decomposed and the

setting power of the whole becoming impaired, thus inducing frilling in plates prepared from it.

The next important step was the discovery by Dr. Monckhoven that, by the addition of ammonia to the emulsion, the modification of the silver haloid was accomplished without the prolonged digestion requisite in Mr. Bennett's process, or the high temperature in that of Mr. Bolton. Dr. Eder subsequently published a process based upon this action of ammonia, in which the silver nitrate is converted into ammonio-nitrate of silver before adding it to the other constituents of the emulsion. This is accomplished by the addition of strong ammonia, drop by drop, to the solution of nitrate of silver, until the brown precipitate first formed is redissolved. Emulsion made by this process is fairly sensitive without further treatment, and a greatly increased sensitiveness is obtained by a short digestion at a comparatively low temperature.

Such is a brief outline of the principal processes in gelatine emulsion making, from which modern practice differs only in matters of detail. It must not, however, be supposed that in emulsion making matters of detail are unimportant. So many requirements are to be provided for, and so many difficulties to be overcome, that it is only by strict attention to every detail that success is likely to be attained; and it must be borne in mind that in gelatine we are dealing with a substance of such unstable nature, that changes occur in it from the moment it is made into solution until it is again dried, and that heat, acids, and alkalis are all active agents in altering both its chemical and mechanical properties.

In collodion emulsions we have conditions which are in some respects the same as in gelatine emulsions though differing materially in others.

Collodion is a solution of pyroxyline in a mixture of ether and alcohol. Pyroxyline is prepared from cellulose, cotton wool being generally used, heated with nitric and sulphuric acids, by which treatment the cellulose becomes chemically altered, though not much changed in appearance. It is insoluble in water, and the most suitable kinds for emulsions are insoluble in ether or alcohol but soluble in a mixture of the two, and it is important to note that the amount of water contained in the solvents has considerable influence on the properties of the resultant collodion, more especially as to its mechanical behaviour. It is probable that no chemical combination ever takes place between pyroxyline, ether, or alcohol, and any of the other substances employed in the formation of an emulsion, except that some samples of pyroxyline may contain other organic matter as an impurity, and which may form an organic silver compound. The function of collodion may therefore more distinctly be laid down to be a mechanical one than in the case of gelatine.

Like gelatine, pyroxyline is not a uniform substance, and collodion made from different samples may differ widely in physical properties, the strength of the acids employed in its production, and the temperature during its manufacture greatly influencing the result. As the process of making it is attended by considerable risk and is very uncertain, even in experienced hands, it is not recommended that any attempt be made at its home preparation, but that it be purchased; and as the great secret of succeeding in collodion emulsion work appears to be in using a suitable sample of pyroxyline—for with some samples no amount of care seems to ensure success, while with others it seems equally impossible to fail—it is well, when a suitable kind is met with, to lay in a stock for future use.

Collodion emulsions may be divided, broadly, into two classes, washed and unwashed. These differ substantially in the fact that in the one case the emulsion is applied to the plates before the soluble salts produced in the emulsification are removed, they being removed by washing the coated plate itself, and in the other case the emulsion being freed from them in a similar manner to that employed in gelatine emulsions, the setting of the emulsion for this purpose being brought about by the evaporation of the solvents of the collodion.

While treating of gelatine emulsion some stress was laid upon the importance of the formation of the silver haloid in a fine state of division. With collodion emulsion this is still more important. With gelatine, however, there is, as has been shown, a considerable power of modifying the condition of the silver; with collodion this power is confined within very narrow limits. Gelatine and collodion emulsions differ from one another essentially in the fact that in the one the fluid medium is water, in which the silver haloids are to some extent soluble, and in the other the fluid is ether and alcohol, in neither of which are the silver haloids soluble. It is true that in some cases water is also present, but this must necessarily be a small portion of the whole or the pyroxyline would not remain in complete solution.

Taking the existing conditions into consideration, it will not be difficult to conceive that a far more complete contact can exist between the particles or perhaps the molecules of gelatine and those of the silver

haloid than can exist between those of collodion and the silver haloid, and as it is probable that one cause at least of sensitiveness in a gelatine emulsion is due to this intimate connection between the silver and gelatine brought about by the solution and redeposition of some portion of the silver, the fact that collodion emulsion cannot be made as rapid as gelatine may possibly thus be accounted for. There is, however, in applying this theory to collodion, the fact to be taken into consideration that those who have succeeded in making the most rapid collodion emulsions have generally insisted on the importance of using bromides which are soluble in alcohol, and dissolving the silver nitrate also in alcohol, thus avoiding altogether the presence of water. The conditions are also different in respect that in rapid collodion emulsions an excess of silver nitrate is usually used.

As an example of a collodion emulsion I will take the formula of Mr. John Nesbit, by which an emulsion is produced in the simplest possible way, having no pretensions to rapidity, even as a collodion emulsion, but suitable for any purpose for which rapidity is not required, such as making lantern transparencies.

FORMULA.

Pyroxyline.....	60 grains.
Ether	2½ ounces.
Methylated alcohol	2½ „
Bromide of ammonium ..	63 grains (53 and 5 excess).
Water	about 100 minims.
Methylated alcohol	1 ounce.
Nitrate of silver	100 grains.
Water	60 minims.
Nitric acid	1 drop.

The bromising solution should be first added to the plain collodion and then the silver solution introduced a little at a time, shaking between each addition.

In this state the emulsion should be set aside for twelve to twenty-four hours to ripen, at the end of which time it is to be poured out into a dish and the solvents of the collodion allowed to evaporate until it is sufficiently set to handle. The pellicle is then washed in a similar way to that employed in the case of gelatine, until the soluble salts are removed. When this has been accomplished the pellicle should be squeezed in a piece of calico to get rid of as much water as possible, and then dried, either spontaneously or by gentle heat, an alternative method being to soak the pellicle for some hours in strong methylated alcohol changed a few times. For use, the quantity of pellicle obtained by using these quantities of material should be dissolved in about eight ounces of a mixture of equal parts of good methylated alcohol and ether 725.

In this emulsion there are five grains of bromide in excess of the combining equivalent, and there is also a comparatively large quantity of water introduced, which would not be permissible if the emulsion were to be used as an unwashed emulsion, but as it is afterwards removed it is of no consequence.

I will now bring my paper to a conclusion. I have, perhaps, not even touched upon many points which might claim to be included in the A B C, but it is not easy to define the exact boundaries of the subject. A large number of those before me will have found nothing to add to their previous knowledge, but I trust there are also some to whom much that I have said is new, and that they will have learnt something at least of the general principles involved in photographic emulsions.

ALEXANDER MACKIE.

CONTINENTAL PHOTOGRAPHY.

[Translations and Abridgments.]

VISIT OF MESSRS. EDER AND STEINHEIL TO PARIS.

PROFESSOR EDER and M. Steinheil took part in the Astronomical Congress in Paris, at which they were the delegates of their respective Governments. The visit was a short one, but the Parisian photographers did their best to organize means to make their visit a pleasant one, a highly representative committee of all branches of the art-science having been formed to bid them welcome. At a dinner they were informed that their labours were well appreciated in France, and during their visit leading photographers like Messrs. Quinsec, Lemercier, Boussod, Valadon & Co., Nadar, and Liébert, gave them full facilities for the examination of their establishments. The Salpêtrière was visited by Dr. Eder, in company with M. Weiss, director of the Observatory at Vienna. Dr. Charcot received them, and the photographic works of M. Londe particularly arrested their attention. They expressed their regret that Austria had not a photographic laboratory of the same kind annexed to an analogous hospital. They examined a multitude of photographs of interesting pathological

cases which amply demonstrated the useful nature of the proofs, taken often under such circumstances of movement that instantaneous exposures alone could be employed to accurately record the facts, and to afterwards afford facilities for studying interesting symptoms.—*Le Moniteur de la Photographie*.

PHOTOGRAPHY AT THE ASTRONOMICAL CONGRESS.

Among eminent photographers present at this Congress were Messrs. Janssen and Prosper Henry, of France; Common, of England; Lohse, of Germany; Hasselberg, of Russia; Gill, of Capetown; and Dunet, of Sweden. The Congress appointed a permanent committee to go into points of detail, but the dimensions and focal length of the objective to be used in each case have been settled: the diameter will be thirty-three centimetres and the focus three metres forty. Ordinary dry plates will be employed, not necessarily of any particular brand, and a suggestion made by Dr. Eder, and others, that other photographs should be taken also upon other plates, has been referred to the permanent committee. M. Hasselberg produced prints proving that views taken of the same portions of the heavens by an orthochromatic plate and by an ordinary plate presented essential differences. The purely photographic side of the questions considered was dealt with almost alone by Dr. Eder. M. Paul Nadar photographed a group of all the members of the Congress, and an hour after the exposures were made proofs were circulated in the hall of the Congress, to the astonishment of the astronomers. The prints were upon Eastman's positive paper. It is believed that the work decided by this Congress will not begin in less than two years from this time, and that it will take fifteen years to complete.—*Le Moniteur de la Photographie*.

PHOTOGRAPHY AT THE UNIVERSAL EXHIBITION AT PARIS.

At the Universal Exhibition in Paris in 1889, photography, Class XII., will be allotted twice the space it had at the Paris Exhibition of 1878; then it had 435 square metres; in 1889 it will have 962 square metres; the position will have a northern aspect, and portions of it can easily be utilised for the exhibition of transparencies. A special section relating to the history of photography will provide facilities for the display of historical documents, and without any expense to the exhibitor. All applications for space should be addressed to the General Director: such applications in the first instance involve no charge and no obligation; it suffices to express a desire to exhibit, and to state what space is wanted for the purpose.—*Le Moniteur de la Photographie*.

MISCELLANEOUS ITEMS.

It is often difficult to make paper adhere to metals. M. Elieff gives the following formula for a mixture which can be used for metal, glass, or wood:—gum tragacanth, 30 grammes; acacia gum, 120 grammes; water, 500 c.c. Dissolve, filter, and add 2½ grammes of thymol suspended in 120 c.c. of glycerine; then add enough water to make up the bulk to 1 litre. This bath will keep a long time.—*Revue Photographique*.

At its meeting on March 8 the Syndical Chamber drew up the proposed rules in relation to photography at the Paris Universal Exhibition of 1889. The proposals have to be submitted to the approval of the administration.—*Revue Photographique*.

M. Gawalowski publishes a simple means of preventing salts from crystallising on the sides of the upper parts of filters; he impregnates the desired parts of the sides of filters with paraffine, wax, or any suitable fatty body.—*Bulletin de la Société Française*.

To restore negatives which have been intensified with mercury and afterwards turned yellow, remove the varnish by means of alcohol, put the plate in water for a short time, then in the open air, because of the bad smell, apply sulphide of ammonium. The negative will assume its original appearance, then wash it in a great quantity of water.—*Deutsche Photographen-Zeitung*.

THE RIVAL PHOTOGRAPHERS.*

For about half an hour Mr. A. kept the old gentleman and his pretty daughter in the studio, and no doubt secured as good negatives as any photographer could from such subjects. The old gentleman was evidently well-to-do, and one not to be permitted to leave a photographic studio too suddenly. It is a very peculiar feature in photography—although not altogether confined to that profession—that the operator more especially if he be the proprietor or holds his place on salary and commission, seldom fails to find out the monetary condition of his sitters. I may also say that not a small amount of the consideration—I won't say flattery—that he receives at the hands of the photographer may be placed to the credit of his banking account.

* Continued from page 276.

It may seem almost incredible, but I can vouch for the fact, that you can find photographers who, should one of their customers unexpectedly pull out a cheque-book to pay their account, will insist on taking them all over the place, and explaining the various merits of every specimen in their show rooms. I need hardly say here that no such customer should be allowed to live another month without at least *one* family portrait in oils, to hand down to posterity the image of one so deserving of undying memory in the annals of their family. I have seen many a glorious, although bloodless, struggle carried on under these conditions. On the one side, the high-minded photographer, full of sympathy, depicting the inevitable sorrow of all that must be most dear to his customer at not having a lasting portrait of "Dear Uncle Benjamin!" And I must say I agree with him, notwithstanding that I benefit occasionally by his eloquence. On the other hand, I have seen the victim—I mean the worthy patron of art, photographic art—several times during the struggle put his hand to his pocket and take it away again. I have often thought, in the solitude of my chamber, whether it was to get his pocket-handkerchief to wipe away the evidence of his emotion, or to recompense the fervour of the photographer by pulling out his cheque-book, and acknowledging his defeat.

Evidently Mr. A. had formed the idea that the old gentleman and his daughter were worthy of no mean amount of attention, for having *waved* them (if I may be permitted the expression) back into the dressing room to resume their belongings, he bravely, but determinately, awaited their reappearance. He had not long to wait; a couple of moments, and they were (so they thought at least) ready to depart.

"I suppose we had better pay now?" said the old gentleman.

"It is the usual custom to pay at time of sitting; but in such a case as yours there is no absolute necessity."

"Oh, business is business! As it is your rule, I do not wish to be an exception."

"Since you insist," resignedly.

Of course Mr. A. was very grieved that such a decision should have been arrived at; but, like a sensible man, would not let his feelings get the better of him. However, he made his mind up that he would be revenged, and determined to follow this positive *cash* customer, if necessary, down every step of the stairs, and even finish the struggle on the doormat, rather than he should leave his studio without deciding to bestow an oil-painting upon his longing relatives.

"Now, my dear, I think we had better go. Mr. A.'s time must be very valuable, and we have already occupied too much of it."

"Not at all," breaks in Mr. A. "From the observations you made, I am convinced you are possessed of considerable knowledge in artistic matters. You expressed the desire to have a true likeness, none of these distorted and untruthful pictures produced by tampering with a pure and simple art."

"I have always argued, if I have a *likeness*, it must be *like* me. One my friends can recognise at a glance."

"Such an one as photography in its own truthfulness can produce?"

"Precisely."

The old gentleman really thought he began to know something about it, and, indeed, began to give his opinions very freely on pictures of his friends that had been so altered in some way or other, he knew not how, that he could not without very great trouble tell who they were. In showing him round the show room Mr. A. drew his attention to some truly excellent pictures, ones in which he might feel justly proud. Unfortunately, we forget at times that we only make specimens of successful subjects, and not the ordinary run of sitters. If Mr. A. would make his mind up to fill his cases with the portraits of the first twenty-five sitters that entered his studio, I fear he would have had a very different set of pictures to set before the eyes of his customers.

"These pictures, you may observe, possess all the softness and character of life. I have set my face entirely against the trickeries and humbug introduced by so many photographers of the present day, and flatly refuse to accept their pernicious help. If truth is what we want, the plain photograph must be truth. Defects, if they were not there in nature, could not be produced by the lens and thrown on to the plate. I positively grieve when I see a good, a really superior photograph, ruined by the uncultured and reckless 'pencil pushing' of that parasite of photography—the retoucher."

The old gentleman looked fairly bewildered at the vehemence with which he assailed something of which he knew nothing. As for myself, I was still more bewildered than he was, when I saw that Mr. A. really believed in all that he was saying. There is no one more ready than I am to acknowledge the ruin caused to a good negative by bad or injudicious retouching; but I will stoutly maintain that, by clever and capable retouching, even the *best* negative (por-

trait) can be improved. It is not the amount of work in such a case that would make the difference, but the judgment shown in placing what little might be requisite to secure perfection.

I am willing to prove what I state by taking the best *portrait* negative, even of a subject in every way favourable to photographic exigencies, and I will guarantee to improve it by retouching. As to whether I do *much* or *little*, that is *my* business; but I will *improve* it.

If the production of a really *good photograph* be the greatest point of excellence attainable in photography, I at once say—Eschew retouching most certainly. But if the production of a pleasing and successful *portrait* be the highest attainable object, I hold the matter is quite different. I will even go further. I will leave out the necessity of a portrait being *pleasing*, and, of course, thereby successful, and merely ask for a *true* portrait; and this, I say, photography will not produce with certainty unaided. It is in such cases, and they are many, that retouching is essential. Many are the cases, too, in which "pencil pushing" is absolutely indispensable. Of course, I speak of skilled retouching.

If the photographers who have such a contemptuous opinion of retouching would not employ unskilled labour (because it is cheap), they would not have so many grievances against a branch of photography that not one per cent. of their number dare ignore in their everyday business. I regret to have to say it, but the *general* tone of retouching is going down, and that only owing to the number of inefficient people who can obtain work from even good photographers at a very low price. It is the *low price* that does it, and the photographers shift the blame off their own shoulders to those of the poor retoucher. There are *really good men* leaving this branch of photography every season, as the price has descended to such a degree that they can no longer make a respectable living at it.

While I have been saying a word or two in favour of the poor retoucher, Mr. A. has been hammering away at him, and to some effect, but in a less complimentary manner.

"Well, I must say I see a great deal of reason in what you say, and hope you will turn out such pictures of myself and daughter as will give us every satisfaction, and be recognisable by our friends at a glance."

"Believe me, no pains will be spared. Excuse me half a moment."

Saying this he went to a speaking tube, and asked his assistant if he had developed the negatives, and if they were good. He received an answer in the affirmative. They were good in every way, so returning to our friend he said, "I have just asked my assistant how the negatives have turned out, and he says they are all right. I can therefore promise you that you will be satisfied. I will let you have the proofs in about a week from now."

"Do, please, I am anxious to have them soon."

"Can I not induce you to decide upon a life-size portrait in oils?"

"I certainly feel disposed that way, but will not decide to-day."

"Your daughter would make a most charming picture."

"You think so? Well, to tell the truth, I feel more disposed to have a picture done of her than of myself."

"Why not have both?" insinuated Mr. A., as if he had been a business man all his life.

"Well, if I do that I would have to have her mother done too. No, I think if I have any done it will be my child's."

"Shall I book it?"

They were not yet on the doormat, but the old gentleman was gradually failing in strength of mind. However, as he got towards the threshold he rallied, and with a supreme effort said, "You have been very kind to us and taken a lot of trouble. I really want a portrait of my daughter, and I tell you what I will do. You may book her portrait, but I won't give more than twenty-five guineas. I only make one condition."

"I accept your offer. And the condition?"

"That the photographs in the first instance give us satisfaction, as it will be from one of them the portrait will be painted."

"Then I will book your order without hesitation, as I cannot possibly fail. All that *photography* can do to make your pictures perfect will be done. In a week from to-day you will have the proofs. You will only have to let me know which you prefer, and the portrait will be begun at once. I will just take the necessary notes regarding colouring. The dress will be according to your own fancy."

Mr. A. here proceeded in the usual way to make notes regarding the colouring, and having completed same, thanked our friend (I say *our* friend advisedly, because *any one* patronising us is a *friend*), escorted him to the inevitable doormat, and, with a final word of thanks, wished him "Good day."

Getting back he booked order, saw after plates, which were satisfactory, told his assistant to have them printed earliest possible moment, and have proofs sent home.

"Don't you think, sir, as there is a painting order hanging to it, you had better have them retouched?"

"Retouched!!!"

"Yes, sir. They are very freckled, especially the lady's one."

"You always bother me about retouching, and I always tell you I will not have it. It is *not* photography. If you develop them properly, and secure a proper density, the freckles will not show unduly. Photography, in its infinite resources, has provided for all these little difficulties, and by its aid must I make the pictures successful. But never, never, my boy, by the aid of a retoucher."

There was nothing further to do, then, than develop, intensify, dry, varnish, print, tone, mount, roll, spot, and send home the proofs. Proofs of what could be done by photography *without* the aid of retouching.

REDMOND BARRETT.

(To be concluded in our next.)

PHOTO-THERMOGRAPHY.

WE have received the following communication, together with two pictures on glass, from Mr. George Mason, of Glasgow:—

"I send you on to-night a transparency of one of the most wonderful things in the way of impressions I have ever seen. This picture, as you see it, is photographed from a piece of glass that covered an etching on which it must have imprinted itself from the etching behind. However, the etching and the glass in frame were never in contact, as there was an overmount between.

"The etching has been in the frame for some years, and has been hanging in a strong light. Messrs. Lawrie & Son, the fine art dealers here, sold the etching, and on removing it from the frame found the front glass had a faint impression of the picture on it, which we have photographed to send to you; from the transparency enclosed you will see the result. Of course the exposures turn out positives, the glass being negative in impression. The frame was three feet seven inches by three feet. The picture was one foot eleven inches, and one foot three inches the subject *The Pied Piper of Hamelin*. A mount fitted between the picture and the glass.

"Now this glass would be about a sixteenth of an inch away from the etching and in front of it. Have you any idea how the impression could be taken up? It must have been thrown back from the picture to the surface of the glass again. It is such a curious thing and probably new to you, that you might be able to make some use of it."

Having carefully examined these truly interesting photographs, we shall endeavour to give a few words of explanation concerning the phenomena.

There is a principle in physics first investigated by M. Ludwig Moser, who in 1842 announced the following fact:—"If a surface has been touched in any particular parts by any body, it acquires the property of precipitating all vapours which adhere to it, or which combine chemically with it on these spots, differently to what it does on the other untouched parts." This was the form in which the law was first announced, but further investigation showed that contact was not necessary, mere juxtaposition sufficing. Emanations were found to be given off from one body to another, in virtue of which vapours were condensed on certain parts in preference to others. Moser designated the phenomena as having been produced by "invisible light," but Hunt adopted the more philosophical term thermography, and made numerous and valuable investigations in this department of physical science, which he published in the *Philosophical Magazine* of the period, and elsewhere. Having found that a blackened paper gave more forcible radiations than a white one, he tried the copying of printed matter, and eventually succeeded in doing so, developing the image by various agencies. The specimens received from Mr. Mason possess an exceptional degree of interest, and are by far the best examples we have seen. That their existence is attributable to thermography, however unhappily it may be named as applicable to this case, we have no doubt. It will afford us pleasure to exhibit them to any who are interested in this still little understood department of physics.

THE FASCINATIONS OF PHOTOGRAPHY.

[A Communication to the North Staffordshire Amateur Photographic Association.]

PHOTOGRAPHY as an intellectual pursuit is so full of *pleasurable* fascination, that few, if any, who have once commenced its practice care to relinquish it again. The delicate chemical manipulations and the wonderful effects evolved by their means, hold us enthralled, as it were, from the time of developing our first negative—and how beautiful we thought it!—to the time when we make our own emulsion for the

plates, or soar to the higher branches of this beautiful art-science. Apart from this, it is a pursuit which can be followed by the tired man of business, or the man of leisure, and even the fairer sex may partake of its pleasures, as the *rudiments* are soon learnt and the chemical operations few and easy.

Sets of apparatus can now be bought for fifty shillings, or even less, so that it is within the reach of nearly all. To all, however, who can afford to do so, I would advise the purchase of a really good set, of a size not less than half-plate, and fitted with rectilinear lens and six double dry slides.

Thus equipped, one has only to wait for King Sol, and throwing care to the winds, may sally forth in search of good "shots" or "bits" for his camera. Here we come across an exquisite bit of woodland scenery, such as is seldom seen except in England—it is quite an idyllic fairy glen, at one end of which a cascade of sunlight glistened water is rushing and tumbling down the rocks into the rippling stream below. Everything is opportune for our success in taking a view of this "gem" of nature, and with our extra rapid plates and drop shutter we secure that which would take a painter weeks of application to achieve, and even then it would not be rendered in such truthful detail, as to do so, the beautiful, yet transient, effects of light and shade on the glistening water must be limned instantaneously.

Or, again, it may be that we are one of a merry picnic party, taking place, we will say, in the vicinity of the old moss-covered ruins of some interesting castle. What is likely to give us more pleasure in years to come than a photograph of the place and people present on the occasion? How many pleasing memories a glimpse of it recalls! These are only a few of the outdoor fascinations of photography, but others meet us at every turn. When after "grinding" hard in the office, factory, or shop, we take our usual annual holiday, what additional zest it adds to it when we are able to bring home with us mementoes in the shape of views of the places or things of interest which may be in the neighbourhood in which we are staying. Instead of sitting in our "apartments" smoking or reading, or "doing" the promenade in a listless fashion, we have an incentive to get out in the fresh air in search of pastures new for our camera; and while gaining health and dispelling *ennui* thereby, the higher faculties of our mind are agreeably brought into play in choosing the most artistic point of view, judging the actinic power of the prevailing light, and requisite time of exposure.

To the cyclist photography lends an additional charm, as in his ramblings many and oft will some enchanting picture present itself to his view, which can be readily transferred to his dry plate, and developed at his leisure.

To the manufacturer the camera offers a ready and accurate means of taking photographs of his patterns or wares, while to the naturalist or antiquarian its aid is invaluable. The naturalist is able to secure instantaneous representations of any part of the body while in motion, and the antiquarian to obtain correct pictures of ancient monuments or buildings, which, in the ordinary course of mundane affairs, must either fall a victim to the ravages of time or the spirit of Vandalism.

W. E. LECK.

(To be continued.)

WHERE I WENT WITH THE CAMERA.

NO. VI.—BERLIN.

From Arnheim I booked right through to Berlin, a weary journey of some twelve hours or more. The refreshment arrangements on the various lines, however, are conducted in such an able manner that they tend to alleviate considerably the tediousness of such a long railway journey. Our railway companies at home might take a lesson from the way a dinner is served up on these lines. You are asked at Oberhausen if you wish to dine; if your answer is in the affirmative the guard sticks a little ticket on the side window of your compartment, a ticket for each person if more than one. When you come to the next stoppage a neat little tray is handed in to you; from the little tickets the waiters know at once where to deliver these. The tray is so constructed that it rests upon your knees without inconveniencing any other passenger. The neat arrangement of this tray was a perfect picture. A small metal basin with soup, two electro-plate covered dishes with different kinds of meat, another compartment with stewed fruits, a triangle of silvered wire in the centre into which is fixed the bread, pepper, salt, table napkin, &c., all combining to make the handiest of dining tables and pleasantest of dinners. At the next stoppage the trays are removed, and the money collected—in this case, two and sixpence. Coffee, milk, beer, and fruit, are offered for sale up and down the platform at almost every station on the line, so that one has every chance of being comfortable from a gastronomic point of view.

One has not the opportunity of getting more than a very hazy idea of

the surrounding country, looking at it from the window of a railway train as it speeds along. On this journey I was impressed with a general tone of flatness all over, relieved now and then by a picturesque little bit, but on the whole uninteresting; very likely it would improve on a closer acquaintance. What was more perceptible to me was the gradual alteration of feature, form, and little touches of manner, observable in the changing nationalities, represented by the platform loungers, as we stayed at the various stations on the way.

Berlin is a noble city—a city of princes and palaces; a city of beautiful buildings and magnificent streets, of gorgeous monuments and graceful statues, of expansive parks, blooming gardens, and charming pleasure grounds; a city of splendour everywhere. Most of the pictures I got when in this city, however, were taken from windows, as there is a very general feeling abroad against photographing in the streets. I asked some friends why this was so; the only reason I could get from them was, that you were likely to create a crowd in the street, and the authorities would not have that. This might have been a feeling more than a fact, but all the time I was there I did not see any attempt to photograph openly anywhere. As there was no chance of being interfered with when making exposures from private standpoints, the pictures I got were made from these.

When in Berlin I visited an exhibition of modern paintings, colossal in dimensions, and the quality of work exhibited fine beyond description. This Exhibition Palace was built as a centenary celebration in commemoration of Frederick the Great. Pictures by the greatest modern masters, collected from all parts of the world, were here exhibited. There were thirty rooms filled with them. It would have taken a couple of days to walk round and take even a cursory glance at the various classes of work exhibited, and to have made a careful examination of all the pictures it would have taken weeks. There was some talk about having the building retained as a permanent Fine Art Gallery, and if it still stands it is well worth seeing, the dome above the entrance-way alone being a perfect masterpiece of artistic decoration.

As a rule, all the people here dine out; what we call the comforts of a house are not indulged in. They leave their dwelling-houses and fill up their leisure time in the restaurant, the café, the concert-room, or the theatre. After they have made their round of pleasure, home they go to sleep. About two o'clock in the afternoon the restaurants are at their busiest and gayest; the many tables crowded with ladies and gentlemen, forming little social gatherings, enjoying themselves to the full of their bent. The "Four Seasons" and the "Dressel" were the best appointed restaurants I visited when in Berlin. The Germans have many dishes peculiarly their own, which are first-rate, and they will go on with course after course for a couple of hours, if you will let them supply and are open to pay. Between ten and twelve o'clock at night the cafés are crowded with visitors of all classes eager to take the last little pleasure out of the day.

To judge from the number and quality of the portraits of the Royal Family to be seen hanging in all places of entertainment, from the first-class restaurant to the commonest café, the Berliners must be the most loyal people on the face of the earth. The King, the Crown Prince, and also Prince Bismarck—life-sized pictures of them on every wall, beautifully finished oil paintings, and fitted into gilt frames that alone must have cost many pounds apiece. How fond they must be of their rulers!

I went to the theatre. It was not tedious, for the whole performance did not take more than two hours and a half. We went in about seven and came out about half-past nine o'clock. I saw a ballet that had been running for some time—a great success—"Amour" I think they called it. The plot was very extraordinary—it began with Adam and Eve in the Garden of Eden, and wound up with some of the latest Prussian victories. The performance was short compared with what we get at home, but the house was crammed, and the audience seemed perfectly satisfied.

When in Berlin I visited the mount manufactory of Carl Ernst & Co., which is one of the largest factories of photographic mounts, as a special business, in Europe. The manufactory consists of a building five storeys high, the square of it being in proportion to its height. On entering the office of the works the first thing that meets the eye of the visitor is the following notice, framed and hung up on the wall opposite the doorway:—

"Say what you want,
Short and decided;
Leave off all superfluous phrases;
Who needlessly uses them wastes our time.
He steals from us—and
'Thou shalt not steal.'"

This means business.

The partners of the firm treated me with the most extreme courtesy and kindness, and placed their time pretty much at my disposal. They showed me over all the works, and explained with considerable detail the various points of interest in the making of mounts—beginning at the plain boards and going right on to the finished article in all its forms. Every flat teemed with hands all busy at some portion of the work. On the first floor they were making ferrotype envelopes; after the printing of these they are cut out, one by one, by a large machine that takes two hands to work. The amount of labour necessary to produce a thousand of these positive picture holders which are sold in the open market at

twelve shillings for that quantity seems incredible. They are first printed, then each one is cut out singly by the machine, after that mounted with the pink paper backing that forms the picture slip, then packed, boxed, and sent into the market to be sold at that small sum.

As we ascend we come to the department where they are making cut-out mounts, with gilt bevel edges round the opening overmounts for photographs. The next is the printing department, where all the lithographic work is done by steam power. The *carte* and cabinet mounts are printed in sheet, and afterwards cut to the size. The ordinary mounts used by photographers—and generally printed on both sides—are all cut by hand, girls sitting all round punching these mounts out of the printed sheets one at a time, and producing hundreds of thousands per day. They have not been able to get a machine to do this kind of work yet, but a girl will cut out seven or eight thousand *cartes*, or five thousand cabinets, a-day; so that it can be easily understood that with a lot of young hands employed a considerable quantity of work could be got through.

The bevelled edged mounts are cut by machinery. The boards are cut into strips first, then the size of card is got by passing the strips through the machine crossways, the knives being arranged to cut them exactly to the proper size.

The bevelling and gilding of these mounts are hand done. Some fifty of them are taken and clamped between two boards placed on a stand, and the workman then scrapes or planes the edge to the bevel required, when they are handed to the gilder to finish. These mounts are usually stamped with the photographer's name and address afterwards, in gold leaf, and singly. In the lithographic department where the designs were made up, it was very interesting to see how they pieced together little bits of transfers taken from different existing designs, the combination forming quite a new pattern with only the photographer's name and address original in the whole composition, by this method saving all the time of drawing and rewriting the whole design anew.

On going over works like this devoted to the production of one class of goods only used in the photographic trade, one cannot but marvel at the growth of the art-science as a business, and ask, if so many hands are employed here, how many hundreds of thousands, scattered over the world, must be employed in the various branches necessary to photographic picture making as an industry?
MARK QUOTE.

BALLOON EXPERIENCES OF A TIMID PHOTOGRAPHER.*

MY SECOND ASCENSION.

As we were compelled to wait until five p.m. before beginning our ascension on September 2, I had very little confidence of success in my attempt at photographing; and the results obtained proved that there was reason for my apprehensions. At that time of year the light is very weak, so that the taking of instantaneous views is difficult, even under the most favourable conditions. When we remember that in addition to this the light also grows rapidly weaker as the sun approaches the west, it is easy to understand that the conditions were very unfavourable to balloon photography.

When the result was known, Mr. Moore offered to make another ascension solely for the purpose of photographing. As my first ascension had quite overcome my fears, and had left me with an earnest desire to again experience the pleasures of an aerial voyage, I gladly agreed. My first ascension enabled me fully to understand what I had suspected before, that it was a much more difficult matter to get instantaneous views from a balloon than from some more secure support. After much time spent in altering apparatus, constructing some new parts, and in further experiments, it was decided to make an ascension on October 16, if the weather should be favourable.

The day was all that we could wish, with the exception of considerable haze in the atmosphere; the wind was very gentle, blowing from the south-west, and high in air we could see by the motion of the clouds that there was an upper current, also moving slowly, toward the south-east. As the inflation progressed, and it was evident that we might soon be off, I found it impossible to ignore a rapid increase of nervousness at the prospect. Those who have made many ascensions assure me that this dread felt at the moment of starting is rarely outgrown by any amount of experience. We went up much more slowly than before, and were for some time within hearing distance of our friends. This was because our ascensional force was more nearly balanced by the greater weight of sand carried.

We were soon over the hills east of Winsted, and before turning from it exposed one plate on a part of the town on which the illumination seemed particularly favourable, and which fortunately proves to be one of our best views. This photograph, taken just as we attained an altitude of 3050 feet, although not so perfectly sharp as some of the others, is nevertheless one of our best, owing to its fine gradation of light and shade, and to the superior delicacy of chemical effect in the negative. The portion of Winsted included in the view is at the northern end of the borough, and at the lowest point within its limits reached by the stream which supplies power to the factories closely set along its banks. Part of our main street passes through the centre of the view,

* Concluded from page 293.

and some other streets are included, mostly occupied by dwellings. Within the limits of the picture are three of the many factories whose business forms the chief support of the place. Many of the garden plots near dwelling houses are plainly shown; also the woods on a steep hill-side at the farther side of the view. The shadow from a passing cloud darkens one corner of the picture, blotting out all definition in that part, and showing how useless it would be to try such work without a good light.

As some may be interested in the details of our photographic equipment, I will give a description of it. We used 5×8 plates, which size seems best suited to our purpose, as it allows a considerable extent of country to be included in the view, while the apparatus need not be unduly bulky or heavy. The camera was quite light, as all the apparatus used in a balloon must be, but not so fragile as to sacrifice rigidity in keeping the distance at which the plate is set from the lens, as this is of even more importance than lightness. The plates used, which must be of the utmost sensitiveness, were contained in the necessary number of dry plate holders, which in turn were carried in two boxes made to pack them securely. In any future ascensions these boxes will be provided with locks, as we have learned to our cost that nothing will so excite the curiosity of the average hotel porter as a photographic apparatus left in his care. The object of packing our plate holders in boxes was twofold: first, the plates were better protected from light and more convenient to carry, as in ordinary work; second, as we knew that the landing is not always as orderly as could be wished, we hoped, by keeping hold of our holders at such a time, to save our exposed plates, at least, from injury.

A "finder" was attached to one side of the camera, to enable the operator to see just what would be included in the view at the moment of exposure. This instrument is like a smaller camera, except that no provision is made for focussing, and the ground-glass is permanently fixed at the proper distance from the lens. The ground-glass of the finder was of the same proportion as the larger plates on which the views were secured, and had lines drawn from either side, crossing at right angles in the centre. The finder is attached to the camera in such a position that any object appearing on its screen will be sure to occupy the same position on the dry plate.

The lens used was of the rectilinear kind, especially made for groups and instantaneous work. The instantaneous shutter, used to cut off the light and give the plates their very brief exposure, was fastened in front of the lens, and was of the kind called an eclipse, but was considerably changed by me before our second attempt. The springs which caused the sudden motion, and admitted light to the camera for an instant, exerted a force of eleven pounds when the shutter was set for action, and were, of course, adjusted to give a quick rather than a forcible motion.

My manner of operating while in the balloon, when we had determined on "taking" any place we might be approaching, was, after deciding on the correct focus, first to "set" the shutter, then insert the plate holder and draw the slide; the camera was then taken in the left hand, with the rubber bulb of the "pneumatic release" of the shutter in the right. Then we must wait until the revolution of the balloon had brought the desired place opposite the camera, when it was pointed so that the view was in correct position on the screen of the finder, the rubber bulb was pressed, and the exposure was made; the slide was then inserted in the plate holder, the holder removed and boxed, and we were ready for another subject. At the same time Mr. Moore recorded the exposure for me, taking down the number of the plate holder, the subject, and the altitude as shown by the barometer. The record was a very necessary guide in developing the plates, and it was kept by Mr. Moore, because in our flight objects of interest were presented in rapid succession, and much time was saved by this division of labour; as it was, the camera was hardly out of my hands during the whole time of our ascension.

The revolution of the balloon referred to is a very curious phenomenon which was a source of much inconvenience; a free balloon revolves almost constantly, and with varying rapidity. The direction of its motion was in both instances of my observation "with the sun;" that is, the side of the balloon and car towards the south turned towards the west and its northern side towards the east.* Many times, just as I was about to expose a plate, one of the cords from car to hoop would come in the way and force me to wait for another open space.

The balloon continued to rise after we had secured the view of Winsted, and the wind carried us towards the north-east, when, at an altitude of 3750 feet, we were nearly south of Riverton, of which we caught a good view.

We continued rising, and soon Moore told me to look up; on doing so, I found the balloon was on the point of disappearing in a bank of cloud, which shut out the blue sky for some distance on each side of us. Under this bank of cloud, which appeared level and dark grey in colour, the light was much reduced, and the chill felt at its near approach produced a feeling of depression.

The balloon entered the cloud, being gradually cut off from our sight as the mist thickened: at length the cords passing up from car seemed to melt away into the mist, leaving us "without a visible means of support." Soon we were in the midst of the cloud, and could feel the dampness; it seemed like moving through a thick fog.

* A high scientific authority says that the revolution of a balloon one way or the other is purely accidental, and depends on the unbalancing of the resistance of the balloon in the air on its different sides; the term *sides* being used in reference to the vertical drawn through the centre of gravity.—*Errors of The Century*.

As we emerged from the upper surface of the cloud, a most wonderful picture was presented to us. In the south a line of the same stratum of cloud we had just left stretched across the sky. This line was at such a distance that we could see both the upper and under sides at once, the dark lower side forming a fine contrast with the upper, glowing in the sunlight.

The sun's rays, streaming across the edge of the clouds, projected a series of long beams of light and shadow to the earth, as is sometimes seen at sunset. In the distance the eye caught a reflection of light from Bantam Lake at Litchfield and from Lake Waramaug farther west, while the many lakes of Winchester and New Hartford seemed directly beneath us. Our barometer told us that the clouds which formed so beautiful an object, and of which we secured a fine picture, were floating at a height of 5500 feet from the earth.

While sailing above a large extent of cloud, one's sense of isolation from the world is oppressive. My view from above the clouds was no disappointment. The appearance of the clouds, seen from above, has been compared by some to the ocean, and by others to an expanse of snow. It is all and more than this, for the continual change, clouds breaking up to form other masses, surging and rolling, with their wonderfully silent, steady, slow motion, impressed me with a deep sense of grandeur and awe.

While passing over a large detached cloud, it was our good fortune to observe a phenomenon rarely seen by man. We had been watching the shadow of the balloon as it slid along the ground, or as it was occasionally projected on an intervening cloud, being then surrounded by a brilliant circular rainbow. We were much surprised on passing over such a cloud to see the shadow as before, but with the addition of another balloon!

The second balloon-shadow was directly opposite the first or upright one, and inverted, so that one shadow of our car served both, while there were two perfect shadows of passengers, netting, and gas bag; the rainbow which inclosed the whole was at this time of exceptional brilliancy. We are entirely at a loss in attempting any explanation of the double balloon shadow; it is certain that we saw it, an object of wonderful brilliancy and distinctness, for about thirty seconds, while we passed over one large cloud; then it was gone, and we hardly hope to see it again.

In connection with this picture we met with a most vexatious piece of misfortune. I made an exposure on that shadow as we were passing quickly over it, and naturally wished most earnestly that I might develop the image successfully, but fate was against us; for in Hartford some one out of curiosity to see the picture, opened the plate holder, exposing the plate to gaslight, and the invisible spirit of my most valuable negative was gone beyond recall. As the subject was of so much interest scientifically as well as for its rarity, we had a drawing prepared from which our illustration is taken, and which is a correct representation of the phenomenon as we saw it.

After gaining a considerable altitude the gas, which does not at first entirely fill the balloon, expands by the diminished outside pressure of the rarefied air and quite fills the envelope; then the neck of the balloon hangs wide open, giving a fine view of the interior, which seems as though filled with air; for the gas is usually quite transparent. This view, the cords of the netting plainly outlined through the cloth, gave us a keen sense of the frailty of our support; there really seemed to be nothing to keep the whole affair from falling down upon us.

While passing over a brook in a rough piece of country, we decided to try the effect of a view directly down through the hole in the bottom of the car, which was left for that purpose; we had found it of little use, for the reason that the balloon so seldom passes directly over the most interesting objects. The hole had been left open, and was at first a source of considerable annoyance, as it took us a long while to overcome the impression that, as one or two towns might be seen through it, we were in danger of falling through ourselves.*

The picture obtained by looking directly down through this hole is one of the best for conveying an idea of the height from which it was taken—over six thousand feet. It should be examined from a considerable distance, and the effect of height will be better produced if the observer will look *directly down* upon it. Three waggon roads are included in the extent of the view, with several dwelling-houses and barns, some cultivated fields, and considerable pasture land and forest. The shadows cast by the trees, and by the irregularities in the land, give the picture some resemblance to the telescopic views of the moon. The bed of Cherry Brook may be seen in the view, lying diagonally across the picture, and between two roads. Later two views were taken near Simsbury.

At one time, when near the upper surface of the cloud, and at a height of 5700 feet, my attention was called to an immense cloud which we were rapidly approaching. I would state here that while the clouds were moving east, the current of air above the clouds was going in the same direction, but much faster, so that the large cloud mentioned *seemed* to be coming rapidly towards us. The camera was quickly made ready, and when the cloud was about one hundred feet from us, I fired; the next moment the car swung through the top of the cloud, and a wave of cold air, like a blast from an ice-house, passed over us. During the few moments from our first notice of the cloud to our plunge into it, we gave

* I asked Mr. Moore why he lifted his foot so high in crossing from one side of the car to the other. He said, "But look down there, and you'll see I'm stepping over two towns."

it our undivided attention; in its swift and silent approach, with the huge mass slowly unfolding, and fleecy particles tearing off in the wind, with the outer surface white in the sunlight, and with clefts in the mass dark as night, it seemed as though about to swallow us up for ever.

We passed over the mountains north of Talcott Mountain, and enjoyed the same prospect which is spread before those who climb the tower, but our view must have been much more extensive in its grandeur. The tower, always a prominent object to travellers upon the roads in the Farmington Valley, we had difficulty in finding, as it is of a neutral colour, and from our position above was not at all conspicuous.

When directly over the mountain we looked down at the forest and roads beneath us, endeavouring to discover some sign of human occupation or activity. To all appearance the country might never have been visited by man; the forest was thick, except when broken by some bare ledge or precipice, and, almost upon the highest part, a lake nestled among the trees, which grew quite to the water's edge. This little lake, almost circular in form, closely surrounded by the unbroken forest, the surface without a ripple, and its waters lying dark and apparently unfathomable, presented a picture of silence and solitude which held our attention while it remained in sight.

The mountains crossed in this delightfully easy manner, we were over the town of Bloomfield; and an exposure was made on what seemed to us a fine type of the better class of New England homestead, which, with its large fields, trim fences, and ample buildings, was directly below us. This view, taken at the height of one mile, is wonderfully distinct, when we consider the distance of the objects from the camera, the conditions necessary to the taking of an instantaneous picture, and our very unsteady support. The stone and rail fences, bounding the fields of all sizes and shapes, are shown with great sharpness. The pasture, meadow, and cultivated land are plainly indicated; also the curiously regular arrangement of the crops. The trim and regular appearance of the orchards is well contrasted with the variety and freedom of growth in the woodland; and the photographic effect of the autumnal colours is indicated by the foliage of a group of white birches near the centre of the view, as contrasted with the dark, unchanged green of the orchards.

Our view towards Hartford at this time was very interesting, though the smoky atmosphere in that direction was a great obstacle to photographing. The Capitol reflected the sunlight from its dome, and many of the prominent buildings of the city could be distinguished. A line of clouds hung over the country south of Hartford, cutting off the light, and producing the singular effect of a view under a shelf or table. The Connecticut River was in sight for many miles above Hartford, until the thickening haze cut off the light far to the south. We were astonished at the number of abrupt turns in the river between the city and Wethersfield.

As we were so nearly there, and sailing in exactly the right direction, we were anxious to remain in the upper air current, and land in Hartford; in order to do so, we threw out all our remaining ballast; the balloon still descended, and soon we saw that our hope must be abandoned, as the lower current began to take us away from the city and in the direction of Windsor.

When we had secured a view of Windsor and the junction of the Farmington and Connecticut rivers, Mr. Moore decided to land before going farther from the railroads; and, opening the valve to let the gas escape, we descended rapidly.

The point selected for our landing was an open field near a large tract of woods; but such calculations are very liable to failure, owing to the difficulty of estimating distance and rate of motion of the balloon, and it was soon evident that the wind would take us over the woods before we could reach the ground. As we had already thrown out all the ballast, and did not wish to sacrifice the photographic apparatus, we could only let things take their course; but we wished for a few pounds of sand, by the loss of which we might have cleared the woods and found a better landing-place.

The balloon sunk rapidly, and soon, as before, we heard the sound of the wind in the trees; we looked anxiously to see where we should strike, but were not long left in doubt as we passed quickly down beside a large chestnut-tree, and the netting of the balloon, which curves far out on each side caught in the upper branches, when our fall was suddenly checked. At first the weight of the balloon and load, descending with such force, bent the top of the tree far over; then, as our momentum was gradually checked, there was a recoil which lifted us again about fifteen feet, where we hung, planning how we should get the balloon down. We could not climb out, for then the balloon, relieved of our weight, would rise and leave us; but, after much hauling and jerking, the netting was detached from the tree, and we were on the ground again. Even then we were but little better off, as no one appeared to help us, and if one left the car the other would surely go up again.

Considerable gas was allowed to escape, and then, while I held fast to a bush, Mr. Moore climbed out and secured our anchor-rope to a tree; then I made my escape, and, leaving the balloon pulling at its moorings, we started to find help. After walking nearly a mile we met two men and a little boy, who asked if we "had seen anything of a balloon around there."

The balloon had fallen near a road cut through the woods, and we determined to get it to the road if possible. To do this, we persuaded the boy to get into the basket, in order to overcome part of the buoyancy,

and let the balloon up the length of the anchor-rope. We were then able to work the rope through the trees, and so led the balloon out to the road. But when we tried to tow it along to the clearing we quickly found it impossible, and the balloon was hauled down and ripped to let the gas escape, as the trees were too near together to admit of the usual practice.

A man was found to carry the balloon to the railroad and us to Hartford; and during the ride there I busied myself trying to recall the experiences of the ascension. As on the former occasion, I observed a singular loss of memory. Immediately after the excitement of landing it was hardly possible to recall a single incident of the ascension. I seemed to have just awakened from a wonderful dream, and the startling experiences so recently passed through appeared to have left only the faintest traces upon the mind. It was not until I had retired for the night, and would have slept, that memory revived, and I was treated (unwillingly) to a complete review of every incident connected with our trip. I am told that this has often been the experience of the soldier after passing through the dangers and excitements of the battlefield.

JOHN G. DOUGHTY.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 6249.—"An Improved Metallic Stand or Frame for Holding Views, Photos, Advertising Tablets, and any such like Articles." J. A. RICHARDS.—*Dated April 29, 1887.*

No. 6331.—"Improvements in Apparatus for Holding and Exposing Sensitised Films, or Paper, or other Flexible Substance in Photographic Cameras."—C. D. DURFORD.—*Dated April 30, 1887.*

No. 6353.—"An Improved Appliance for Use in Treating and Washing Photographic Prints and Plates." The Hon. W. GRIMSTON.—*Dated April 30, 1887.*

No. 6613.—"An Improved Detective Camera for Artists." S. W. ROUCH.—*Dated May 5, 1887.*

No. 6673.—"Improvements in Photographic Instruments." Communicated by J. R. CONNOR. Complete specification. A. J. BOULT.—*Dated May 6, 1887.*

No. 6791.—"Improvements in the Method of Mounting and Manipulating Backgrounds for Photographic Operations, and in Apparatus therefor." C. BRUNNER.—*Dated May 9, 1887.*

PATENTS COMPLETED.

IMPROVEMENTS IN PLATES AND THE LIKE FOR PHOTOGRAPHIC PURPOSES.

No. 5793. JEAN BAPTISTE JOSEPH JOURNOUD, Lyon, France.—*April 28, 1886.* This invention relates to the application of celluloid, xylonite, and the like to photography by using celluloid, xylonite, or the like plates for negatives and positives, as also by replacing the ground-glass in the camera by translucent plates of celluloid, xylonite, or the like.

Glass, paper, cardboard, metal, and other materials used in photography up to the present for negatives and positives present serious inconveniences. Glass is breakable, heavy, and cumbersome, faults particularly serious for travelling and for the country. Paper, cardboard, and metal plates possess an opacity which renders the watching of the development exceedingly difficult, and prevents the operator from precisely assuring himself of the reduction of the silver film by the cyanides and hyposulphites.

To obtain at once the necessary rigidity, lightness, and resistance to breakage and warping by the action of the water bath and reagents, as well as the necessary transparency or translucency, I employ thin plates of celluloid, xylonite, or the like.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. The employment of plates of celluloid, xylonite, or equivalent cellulose-product as the support or foundation for negative or positive photographic images or productions. 2. The employment of plates of celluloid, xylonite, or equivalent cellulose-product for the focussing plates of photographic cameras.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
May 17	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
" 17	North London	Myddelton Hall, Upper-st., Islington.
" 17	Bolton Club	The Studio, Chancery-lane, Bolton.
" 18	Bristol and W. of Eng. Amateu	Queen's Hotel, Clifton.
" 18	Bury	
" 18	Hyde	Meenbanics' Hall, Hyde.
" 18	Manchester Club	
" 18	Edinburgh Photo. Club	5, St. Andrew-square.
" 18	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 19	London and Provincial	Mason's Hall, Basinghall-street.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. James Glaisher, F.R.S., President, occupied the chair.

The HON. SECRETARY read a letter from Mr. G. M. Whipple, of Kew Observatory, saying that at a forthcoming meeting of the Royal Meteorological

Society the exhibition of some photographic prints of flashes of lightning would have a special interest, and he should be glad of the loan of any such prints from the members of the Society who had taken them.

The PRESIDENT said that neither Mr. Spurge nor his paper for that evening had arrived, and that a sub-committee had suggested for discussion the question, What was the most practical method of obtaining photographs not less than 12x9 inches in dimensions?

Mr. J. TRAIL TAYLOR said that the best plan was to take a negative and to print from it upon albumenised paper. What idea was underlying a question so obscurely phrased?

Mr. T. SEBASTIAN DAVIS responded that the cameras of amateurs rarely took plates larger than 7x5 or 8x5, and a picture of such small dimensions quite lost its effect when put on view in a public exhibition; a larger camera in the field would have to be carried by a Hercules. What was the best way of enlarging to not less than 12x9? Direct enlargements on gelatino-bromide paper usually had a heavy effect, so what was the best practical method of obtaining the desired size? He had found it best to take the largest practicable negative in the first instance, because with it any minor blemishes were less apparent in the finished work.

Mr. TAYLOR stated that some of the best photographers, like Mr. W. Bedford, for instance, produced large pictures of admitted excellence. Although a good plan obviously was to take a small negative and enlarge it afterwards, yet would it be desirable to inquire whether Mr. Bedford would not prefer taking his large negatives direct, than to enlarge from those of smaller dimensions.

Mr. W. BEDFORD had never made any secret of the process he used; he preferred negatives of the required size taken direct in the camera, for there was a great loss of effect in enlarging, because when enlarging is done by producing an intermediate transparency, although the defects of the method can be modified to a certain extent, he thought that they were always apparent. He had had but small experience in enlarging direct upon paper, but he did not see why very good pictures could not be taken direct upon platinum and other slow papers by means of the solar camera. Once he made an enlarged transparency, printed a negative from it upon paper, then waxed the latter, which process was devised by Mr. Blanchard. He thought it well never to enlarge beyond the standard size of a sheet of albumenised paper, because then colour was much missed.

Mr. VALENTINE BLANCHARD had devised the process just mentioned about twelve years ago, and even Mr. H. P. Robinson did not know that some of the results were enlargements until his closer attention was called to the prints. Mr. Dixon's prints of animals had been taken by the same process. The printing must be very deep before waxing, and as it is easy to turn out a hundred or more paper negatives in this way, it facilitates the production of prints in long numbers. Mr. Dixon used for the purpose a specially prepared autotype paper, and he intensified with permanganate of potash. The transparency should be as solid as possible, developed deeply like a negative till all the details were well rendered. This mode of procedure was absolutely necessary.

Dr. W. F. DONKIN remarked that smaller pictures than those named in the question had gained medals at the exhibitions.

Mr. DAVIS thought that they would have been better if enlarged.

Mr. DEBENHAM remembered many good small pictures at exhibitions.

Mr. SAMUELS said that small pictures sent to the exhibitions received due attention from the judges. Take, for instance, *Improving the Understanding*, also *Neddy's New Shoes*. The little direct picture of the latter attracted more public attention than the enlargement thereof.

Mr. EDGAR CLIFTON remarked that gelatino-bromide paper offered a ready mode of obtaining the transparency for Blanchard's process.

Mr. W. ENGLAND had seen good results direct on bromide paper.

Mr. DAVIS stated that desirability of size depended much upon the subject; mountainous scenery did not look so well in small prints.

Mr. FRIESE GREEN asked whether the Society could not establish weekly classes for the errand-boys and assistants of photographers, the members taking their turn to instruct the learners.

Mr. AYRES suggested that they should be taught the extraction of the square root.

Mr. W. M. ASHMAN thought that there was something in Mr. Green's suggestion, although it had been a little crudely put. One of their Vice-Presidents, Mr. John Spiller, had recently given lectures to a class of students in the City, and such able teaching as his was very valuable indeed, for he brought up processes long forgotten. Mr. Spiller should be consulted on the subject.

The PRESIDENT thought that while the Society was but in lodgings, its new efforts in any direction must be very limited. Several persons had offered to give £20 for taking permanent premises. He had put his own name down for £50, and if a sufficient number of persons would put their names down for £100 he would increase his subscription to £100.

Mr. CARTLAND said that he would contribute £10.

The PRESIDENT asked what was the best method of intensifying?

Mr. DEBENHAM thought it strange that the method which he had found better than any other was still so little used. He applied iodide of mercury to the film, well washed it, and then applied a solution of Schlippe's salt. His oldest negatives intensified by that method had been taken seven years ago, and were still unchanged. The negative must be perfectly fixed by sufficiently long immersion in the hypo, and the washings between the various stages must be thorough. If bichloride be used instead of iodide of mercury, it must be acidified with a little hydrochloric acid.

Mr. W. COBB thought it a complicated method, since there had been of late no difficulty in getting plates to give negatives of sufficient density. When, however, the negative wanted a little "picking up," he applied a very weak solution of bichloride of mercury, say, ten or twenty drops of concentrated solution diluted with twenty ounces of water.

Mr. ENGLAND could corroborate what Mr. Cobb had said, but he applied ammonia after the mercury.

Mr. ASHMAN said that Mr. England bleached the image first with mercury, then applied the ammonia.

Mr. COBB took care not to reach the bleached stage. The weak mercurial

solution had no visible effect at the time of application, but the added intensity became evident in the drying. If the action of the mercury were too prolonged, the intensity of the image would be reduced.

Mr. BAUM knew nothing better than mercury followed by ammonia, and had never known a negative so intensified to fade.

Mr. DEBENHAM had found Mr. Cobb's plan to answer only when the negative wanted but "a little picking up." The popular verdict as to Mr. Baum's method was that such negatives were not permanent; moreover, the method seemed to be limited to but one degree of intensification, which might or might not be the one required.

Mr. C. W. HASTINGS was elected a member of the Society.

The PRESIDENT said that at the next ordinary meeting of the Society Mr. E. Crookshank would read a paper upon *The Use of Photography in Microscopic Research*. The latest date for receiving pictures for the next exhibition of the Society would be September 21; the *soirée* would be held on October 1.

The meeting then broke up.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, May 5, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. A. L. Henderson presided. There was a large attendance.

Mr. F. W. COX asked whether a wooden sink lined with lead would be a good one for ordinary photographic purposes.

Mr. W. E. DEBENHAM responded that such sinks were almost universally employed.

Mr. A. COWAN stated that there was nothing better than a plain wooden sink with a wooden gridiron on the bottom, all coated when very dry with melted paraffine wax.

Mr. J. B. B. WELLINGTON exhibited some orthochromatic prints of yellow flowers.

Mr. W. M. ASHMAN, in the absence of Mr. Spurge, produced prints the outcome of experiments done by Mr. Spurge with his sensitometer.

Mr. DEBENHAM thought that any one but the producer would have difficulty in explaining the meaning of the aforesaid prints.

Mr. W. BEDFORD remarked that they illustrated the effects produced by variations of the proportions of the components of the ordinary pyro-bromide-ammonia developer, and that Mr. Spurge preferred platinum paper to albumenised paper for obtaining true gradation in printing.

Mr. DEBENHAM thought that the temperature of development might have affected the results.

The CHAIRMAN regretted that Mr. Spurge was not present.

Mr. F. A. BRIDGE exhibited photographs of the pantomime of *Bluebeard*, taken in about twenty seconds by him at the Standard Theatre in 1879; some lovely fairies rose up when they should not have done, so were blurred.

Mr. COWAN thought that they were over exposed.

The CHAIRMAN exhibited an actinometer made by Messrs. Taylor, of Leicester, which seemed to him to be a well-made and well-thought-out instrument, although he had not yet tried it practically. To describe it would necessitate the use of diagrams.

Mr. DEBENHAM said that it would only test the visual power of the light, but with that information the experienced photographer could form some idea of its actinic power.

Mr. E. CLIFTON remarked that by it the strength of any desired portion of the image could be ascertained, and that was an advantage.

The CHAIRMAN exhibited an actinometer, made by himself, having somewhat the appearance of a chromotrope; it consisted of a ring of holes glazed with various thicknesses of yellow-stained gelatine and of a movable ring of holes similarly glazed; the one ring moved over the other when a handle was turned. In use he adjusted a pair of superimposed holes to that thickness of gelatine layers which just prevented him from seeing the sitter when he looked through them.

Mr. CLIFTON thought that blue layers would have been better, and would have given some idea of the actinic power of the light.

Mr. WELLINGTON wished to know the best way to intensify collodio-bromide negatives without the use of silver; he had found that any over treatment with mercury gave them a nasty colour.

Mr. A. MACKIE asked if he had tried the intensifier of the Platinotype Company, which gave splendid coffee-coloured negatives; he believed that it contained platinum and mercury.

Mr. W. M. ASHMAN suggested intensification with silver and fixing in cyanide of potassium instead of hypo.

Mr. A. HADDON said that a correspondent who had asked THE BRITISH JOURNAL OF PHOTOGRAPHY the best way to restore a negative stained from the mercury not having been thoroughly washed out, had been informed in reply that such stains could seldom be removed, but that the application of cyanide of potassium could be tried. He thought that to be a wrong method, and that weak hydrochloric acid would have the desired effect, with a subsequent washing, and, finally, an application of ammonia.

Mr. WELLINGTON thought the chief cause of stained gelatine negatives to be imperfect fixation.

Mr. MACKIE was of the same opinion.

Mr. H. M. HASTINGS had had some platinotype paper given to him which had been kept for six months and was believed by its owner to be perfectly useless, but he had nevertheless succeeded in getting an unfogged print upon it by the use of a hypochlorite, in the manner he had described at the previous meeting of the Association.

The meeting then broke up.

CAMERA CLUB.

ON Thursday, * April 28, members and friends gathered to hear Mr. Lyonel Clark read an account of his recent trip to the Spanish Main. Mr. J. Traill Taylor occupied the chair.

* Supplementary in part to previous notice

A most interesting lecture was delivered, and the address was illustrated by lantern slides made from negatives taken by Mr. Clark on the journey.

Previous to the lecture, and in response to the invitation of the Chairman, Mr. Clark showed a new washing and drying rack for negatives, the invention of Mr. Blackmore, in which the negatives are slipped into grooves and immersed in a pail or pan of water; when sufficiently washed the rack can be hung up and the negatives dried. On removing the plates the rack folds up and can be hung up out of the way. It is especially convenient for travelling.

Mr. G. Davison showed an excellent negative on the new Froedman film, taken the previous day at Burnham Beeches. This film is manufactured by the Woodbury Tissue Company. It is treated like an ordinary negative, no stripping or special manipulation being required.

Mr. Ferrero showed some interesting experiments on the rapidity of shutters, made by photographing a white spot on a bicycle wheel revolving at a fixed rate. Farnell's shutter gave, at 0, one-fourty-sixth of a second; at shortest possible exposure, one-sixty-ninth; set at one-quarter of a second, it gave one-seventeenth. Lancaster's Instantograph gave one-thirty-fourth of a second. The "Mary Ann" varied from one-tenth to one-twenty-seventh of a second, according to elastics used. Drop shutter gave one-twelfth of a second without elastic band, and one-twenty-seventh with. Prints were handled round.

Mr. Clark showed some travelling bottles manufactured by Messrs. Hinton & Co. The glass bottle is protected by a metal case opening with a bayonet joint; a spring in the top keeps the bottle in place.

Some slides of the group taken at the recent excursion to Hayes by Messrs. Dresser and Barclay were shown, and also a very interesting slide of a negative taken by Messrs. Lyonel Clark and W. H. Hyslop at the St. James's Theatre. The negative was on a plate isochromatised by Mr. Hyslop. The exposure was ten seconds, with the ordinary gaslight of the theatre, no limelight even being used, and the details were well shown on the slide.

The SECRETARY drew attention to the Club excursion to Gomshall, arranged for Saturday, May 14.

At the meeting held on May 5 the first set of lantern slides sent by the American societies in exchange with the Camera Club was again exhibited previous to distribution. A good company assembled, and the exhibition gave very great pleasure. Mr. W. A. Greene occupied the chair, and, at his invitation, the HON. SECRETARY drew the attention of those present to some very fine photographs of theatrical scenes at the Criterion, taken by Mr. J. F. Roberts. These photographs were taken by the ordinary light of the theatre in April last, and show some of the best and most finished work of the kind ever done.

Some slides made by Mr. Roberts from his negatives, and also others showing groups by Mr. Barclay, taken at the Burnham Beeches Club excursion, were put through the lantern. The American slides were then shown. The collection includes a very great variety of interesting subjects, amongst the best of which were tow boats on the Ohio and other river scenes. Some very picturesque bits by Mr. Stettinius attracted much attention, as did also several humorous subjects with children and pictures of winter scenes and yachts racing.

The 1887 International Exchange is in course of arrangement, and it is hoped that equal success will attend it.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held on Tuesday, May 3, 1887, at Myddelton Hall, Islington, N., Mr. J. Humphries, F.S.A., Vice-President, in the chair, Messrs. B. B. Fuller and G. Mengel were elected members of the Society, and Messrs. — Cusworth, J. G. Hilton, and E. Purton, were proposed for membership.

Mr. A. MACKIE, Vice-President of the Society, then delivered a lecture on *The A B C of Photogenic Emulsions* [see page 293].

Mr. F. W. COX inquired whether collodion emulsion plates were quick enough for negative work.

The lecturer replied that plates from emulsion made by the method he had demonstrated would make good negatives, but were very slow indeed. A much quicker emulsion might be made with an excess of silver, but then greater care was necessary in the manipulation.

The CHAIRMAN inquired how collodion emulsion could be made to give an image of a warm tone.

The lecturer replied that the colour of the image was to a great extent dependent upon the exposure given, a long exposure and restrained developer giving a warm tone.

Mr. J. TRAILL TAYLOR, President, said that in the early days of gelatine Mr. Burgess made emulsions of great sensitiveness; he did not disclose his process, but his method was probably similar to that of Mr. Bennett. Mr. Kennett also made very sensitive plates, but had extreme difficulty in inducing his patrons, who were accustomed to collodion, to give sufficiently short exposures. Mr. Kennett sold his emulsion in the form of dry pellicle. Mr. Taylor believed that if it could be obtained in this form new it would be of great convenience to photographers in the colonies and elsewhere.

Mr. W. M. ASHMAN said that this was his first visit to the Society. He congratulated the members on having heard an able lecture, in which all the ground connected with emulsion making had been covered. He thought the meeting would like to hear something about the methods employed in coating gelatine plates.

The lecturer said that his lecture professed to treat of emulsions only, and not of the method of using them. However, it was necessary when plates were to be coated to prepare a level surface, say of glass or slate, upon which to lay the plate until the emulsion set. The emulsion was flowed over the plate in a somewhat similar way to coating plates with collodion.

Mr. E. CLIFTON said, with reference to the keeping qualities of collodion emulsion, he had purchased a bottle of Messrs. Wratten & Wainwright about seven years ago; two years ago, that is, five years after it was made, he had prepared plates from it which he exposed and developed, producing perfect results. He had still some left, which he shortly intended to test again.

In reply to Mr. Taylor, the lecturer said that he had, in the early days of gelatine emulsion, used camphor to prevent the emulsion from decomposition when it was required to be kept. Thymol, however, was now more frequently used, and acted perfectly efficiently.

The lecturer, having been asked by the Chairman for a general reply to the remarks of the members, said that he had endeavoured to reply to questions as they had been asked. His intention in giving the lecture had been to say sufficient on the subject to enable any one to take any published method of making an emulsion and to understand not only the instructions but the theory upon which they were based.

The proceedings terminated with a hearty vote of thanks to the lecturer.

Saturday afternoon outing, on May 14, to Hendon. Train, forty-one minutes past two from Moorgate-street. Next meeting on Tuesday, May 17. Demonstration by Mr. Walker, of the Eastman Company. Visitors are invited.

NORTH STAFFORDSHIRE AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting was held at the Mechanics' Institute, Hanley, on May 4, under the presidency of Mr. C. Alfieri, President of the Association.

A list of eight excursions for the season 1887 was drawn up, and their approximate dates arranged, the places selected being Buxton and Miller's Dale for May. Afterwards Dovedale, Haddon and Asford, Trentham, Keele, Moreton, Tutbury, and Lichfield, due notice of which will be given to members by the Hon. Secretary.

Messrs. Drummond and G. Wright were elected members of the Association.

The opinion of members having previously been obtained by circular, it was decided that the annual subscription be in future reduced to 5s.

THE PRESIDENT exhibited a beautiful 12 x 10 silver print of a ruined abbey in Denbighshire, the negative of which he had himself seen Mr. Francis Bedford take thirty years ago. The print was one of the first taken from the negative, and was almost as good as when first produced.

Mr. LECK was then called upon by the President to read his paper upon the *Fascinations of Photography* [see page 297].

This was listened to with great attention, and a vote of thanks passed to Mr. Leck for his interesting and instructive lecture.

HALIFAX PHOTOGRAPHIC CLUB.

THE monthly meeting of the above Club was held on Thursday evening, in the Mechanics' Hall,—Mr. E. A. Caw in the chair.

A paper on *The Bromide Paper Process* was read by Mr. B. ROWLEY. He thought it possessed special advantages for producing pictures from negatives, which from their thinness or over density could not be utilised similarly by any other process. Time would be required to test the permanency or otherwise of results. If it was possible to eliminate the last trace of hypo, there did not seem to be any reason why a bromide paper picture should not be as permanent as any other kind. Speaking of the different kinds of paper in the market, he had well tried the Eastman, Morgan & Kidd's, and Fry's makes, and had no hesitation in saying he could do good work with any of them, and that he considered them equal in quality.

The Secretary was instructed to write to some of the Photographic Societies in the neighbourhood with a view to arrange joint excursions during the summer months.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

THE annual meeting for election of office-bearers for the next session was held in Lamb's Hotel last Thursday, when the following were unanimously elected:—*Hon. President*: Dr. Carmelley, University College.—*President*: Mr. G. D. Macdonald, F.I.C.—*Vice-Presidents*: Dr. Tulloch and Mr. John Robertson.—*Council*: Messrs. Geddes, Fraser, Kerr, Mathewson, J. R. Wilson, G. A. Maclaren, Martin, Hill, and Owen.—*Treasurer*: Mr. V. C. Baird.—*Secretary*: Mr. James Rattray. Mr. James C. Cox was unanimously chosen as the delegate of the Society to the Photographic Convention to be held in Glasgow in July.

Correspondence.

Correspondents should never write on both sides of the paper.

M. CHARDON ON EASTMAN'S PAPER.—ENLARGEMENTS BY NADAR.—A NEW ANTI-PHOTOGENIC FILM FOR WINDOWS AND LANTERNS.—HOW TO OBTAIN GOOD ENLARGEMENTS WITH EVEN AN ORDINARY NEGATIVE.—A ROLL HOLDER ON DARK SLIDE FOR FILMS.—A POCKET CAMERA.—A NEW DODGE IN ENAMELLING PHOTOGRAPHIC PROOFS.—PRESENTATION OF CAMERAS AND FILM HOLDERS.—A POCKET CAMERA WITH A VERY NOVEL APPARATUS FOR CHANGING PLATES.

The Photographic Society of France held their monthly meeting on Friday evening last, the 6th instant, M. Bardy in the chair.

Mr. Chardon made a communication on the value of Eastman's paper for amateurs and others.

M. Nadar exhibited some very fine enlargements on Eastman's paper, one of which was about two yards high. These enlargements were greatly admired by all present.

M. Scola exhibited some glass plates having an orange-red tint, which, he stated, were very suitable in replacing the very expensive ruby glass in dark-room windows, lanterns, &c. He informed us that he obtained that tint by coating the ordinary white glass with a solution of gelatine

in which a little silver nitrate had been dissolved. This is the formula he gave,—

Water	100 parts.
Gelatine	5 "
Silver nitrate	1 to 5 "

It can be seen that more or less silver is used according to the density of the colour required. In my judgment the best results were obtained by M. Scola when he used four parts of silver nitrate. When the plates or sheets of glass are coated with the solution they are left to dry in the dark; when thoroughly desiccated, they are placed in full light for ten or fifteen minutes. They then become of the yellow-ruby tint required. The plates are then plunged into a solution of hyposulphite of soda. When washed and dried they are ready for use.

M. Scola informed us that the plates when coated (as soon as the emulsion be set) can be exposed to light, and the same results as to colour be obtained; but the plates, when exposed wet, gain a very disagreeable reflecting property, which is not a gain, but rather a loss, to the purity of the colour obtained, and for which the short exposure required to obtain a corresponding tint does not offer a compensation. It has been found more advantageous to allow the plates to dry in the dark than to expose them when wet.

These experiments of M. Scola are very interesting, and deserve to be repeated. They may, I think, give us a clue which may lead to the discovery of the cause of the formation of the red fog, which we heard so much about in the advent of gelatino-bromide of silver preparations. I would most willingly have conducted a series of experiments having this object in view, but, alas! my establishment in Paris has been destroyed by fire, and I have not a room in which I can develop a negative at the present moment.

M. Nadar exhibited a very fine enlargement on Eastman's paper of the members of the Astronomical Conference. The enlargement is three feet by two, and was obtained from a half-plate negative. The enlargement, in fact, was far superior to the original negative. This gave rise to a discussion, and a communication by a member, *How to Obtain Good Enlargements with more than Ordinary Negatives*. The author said: "I reproduce the faulty negative in the camera on one of the old-fashioned collodion dry plates. Major Russell's tannin process is the best. Gelatino-bromide of silver plates must be discarded," he said.

In developing the *cliché* one is surprised to discover details come out of which the original negative seems wholly devoid. Naturally, a skilled operator alone can produce a first-class positive in every way satisfactory for the object in view—the enlargement. A negative was shown round accompanied by a positive obtained under these conditions. A proof from the same negative was then shown, and a proof from a negative obtained from the positive was handed round. The difference in the two was extraordinary. In the first, confusion; in the second, detail—in fact, a high-class negative. The enlargement was then shown, and was worthy of an exhibition.

M. Mario Carquero presented his perfected roll holder or dark slide for negative paper, which for simplicity and lightness leaves all others behind. The spool bearing the sensitised paper is movable, and can carry twelve yards of film, and when this is used up the spool can be taken out and replaced by another spool in full light, which is a great advantage to the amateur on a tour. After each exposure the paper is pricked across its whole width like postage stamps. For travelling the spool can be taken out; then the mahogany frame folds up and lies perfectly flat. This roll holder was greatly admired, and the maker was complimented in that he had combined simplicity with strength, and at a very low sum (20s.), which would incite other amateurs to dabble in photography. A great number of landscapes were exhibited to prove the value of the apparatus.

M. Mendoza exhibited a pocket camera. This apparatus differs but little from the numerous pocket apparatuses now in the market. A seeker is adapted to the apparatus, consisting of a kind of reversed telescope with a ground-glass, on which is portrayed the object to be photographed.

M. Vidal informed the Society that he had thought of a dodge by which in enamelling photographic proofs an artistic border or frame with the name of the photographer or any other inscription could be had at the same time and without any difficulty. Every one knows the engraved glass panes in the centre of which carbon proofs are placed, intended to be hung at the window so that the proof can be seen by transparent light. The engraved and ornamented border of the glass makes a whole agreeable to the eye. M. Vidal takes one of these engraved glass plates, the centre of which is of the size of the print to be enamelled—naturally the centre is of plain glass, the ornamentation the same, all the rest of the plate is of ground-glass. This engraved plate is talced, and the photographic proof, obtained by the gelatino-chloride of silver process, is laid and squeeged upon its surface; when dry the print will leave its support, and the paper will be beautifully glazed upon the print as well as upon the design—the latter will stand out upon a matt ground. Naturally proofs will be more expensive, as the proofs are printed with a large margin, which margin must be hid from light during the operation of printing. The ordinary albumenised proofs can be enamelled as well, by operating in the same fashion as those who enamel in the so-called "Parisian style"—collodionising the plate in the first instance and then making the proof adhere to the collodion by gelatine. Many changes can be rung

upon this idea; the engraving alone may be matt—this would give the whole of the paper brilliant with the exception of the design, which could be matt. In fact, it is not necessary to go to the expense, now I think of it, to print the proof with a large margin—a sheet of coloured paper can be enamelled and the print placed in its centre, which would have a very pretty effect.

M. Mackenstein presented a camera of his make, together with a film carrier; this consists of thin zinc of a quarter of an inch larger than the size of film required. This quarter of an inch is turned over and makes a frame. The film is inserted, and then a piece of ebonite is pushed down behind it, which stretches the film. It can now be inserted into any dark slide with the same ease as an ordinary dry plate.

M. Hanan exhibited a very small camera, which he has named "L'Omnigraphe." This pocket camera differs from many others in the market in that a new system of changing plates is adopted. The system is very ingenious. The camera contains twelve plates; as soon as No. 1 is exposed a drawer is pulled out holding the eleven remaining plates; No. 1 now falls down (I forgot to say that the camera must, during the changing of plates, be laid horizontally, the lens pointing upwards); the drawer is now pushed in and the second plate is ready to be exposed, and so on until the whole twelve are exposed. This invention will do away with the old-fashioned changing box, as the author says it cannot get out of repair nor clogged up in any way. Amateurs will be glad to know that films can be used with this apparatus as well as dry plates.

59, Rue des Batignolles, Paris.

Prof. E. STEUBING.

THE RIGHT TO THE NEGATIVE.

To the Editors.

GENTLEMEN,—Mr. G. A. Rattray in his last letter asks, "Is it not a fact . . . that photographers charge in their first price for prints, the cost of the glass, and all the chemicals and subsequent operations for the production of the negative?" (I presume Mr. G. A. R. by "subsequent operations" means lighting, and posing, and retouching.)

Let us take a case in point. B. is photographed and pays twenty-five shillings for a dozen cabinets. Twelve months after he again orders another dozen from same negative, but only pays this time twenty-one shillings. Does Mr. G. A. R. assert that the four shillings pays for plate and "subsequent operations?" It may be the money value of the plate, but certainly is not an equivalent for the skill and time of the operator and retoucher.—I am, yours, &c.,

Nottingham, May 9, 1887.

OPERATOR.

To the Editors.

GENTLEMEN,—Does it not seem highly curious that after about forty years of "use and wont," a discussion should arise about the ownership of photographic negatives?

My photo-professional career began at the middle of the century, and although my entries for sittings numbered for many long years far above a thousand yearly, and my sitters included the titled nobility as well as the better class of working people, not one of them ever claimed the negative as their own.

It did occasionally happen that a sitter on leaving for foreign parts took a fancy to the negative I had taken of him or her, and asked its price; and on every occasion, when an agreement was come to, I received my own price for the negative in question.

This even happened with more than one well-known person, and I may name Miss Hosmer, the celebrated American sculptor, who, after getting as many photographs printed as supplied her friends in this country, bought from me the negative I had taken of her that she might get what number of prints she wanted taken from it in Rome.

This practise I thought general, and one of

USE AND WONT.

Exchange Column.

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

Wanted, landscape lens (whole-plate) in exchange for good studio furniture.—Address, A. B., 656, Holloway-road.

Will exchange musical box for good 9x7 view lens.—Address, J. E. OATET, Photographer, Wadebridge, Cornwall.

Will exchange an interior and exterior background in good condition for other backgrounds.—Address, ALLAN, 23, Fore-street, Hexham, Northumberland.

Will exchange a case (45x30) of stuffed birds for a studio stand, bellows-bodied camera, or backgrounds.—Address, H. H. HILL, East-street, Bridport, Dorset.

I will exchange quarter-plate mahogany studio camera complete, with light metal tripod, for quarter-plate lens.—Address, H. WHEATLEY, 17, Manchester-road, Hopwood, Heywood.

Will exchange 15x12 camera and two slides for whole-plate and double slides with latest improvements.—Address, GEO. SHERMAN, Pier Studio, Regent and Nelson-roads, Great Yarmouth.

I will exchange two volumes of the *Magazine of Art* (unbound) for 1885 and 1886 for quarter-plate bellows-body camera and double dark slide.—Address, JOHN CHALMERS, 43, Campbell-street, Hamilton.

Wanted, Guerry's flap shutter, to fit Ross' 5x4 rapid symmetrical; exchange, a book of twenty-four drawings of the human figure, by Julien, of Paris, size 12x10.—Address, G. MAYBANK, 7, Ridge-street, Southwark Park-road, S.E.

Will exchange studio camera, half-plate carrier, also quarter-plate camera and lens, and mahogany tripod stand, and pair of stereoscopic lenses. Wanted, head-rest, backgrounds, and accessories.—Address, W. HYETT, Suffolk Studio, Cheltenham.

Wanted, half-plate camera lens, &c. ("International" preferred), in exchange for three-draw telescope, about thirty-six inches long, one-and-a-quarter-inch object glass, and tripod. Difference in cash.—Address, WM. HAINSWORTH, Upper Wortley, Leeds.

I will exchange Cadett's shutter for any size lens, quarter-plate Ronch bellows camera with four dark slides and lens for same, also pair of stereoscopic lenses. Wanted, head-rest, studio camera stand, whole-plate outdoor camera with three or more double dark slides, and 12x10 wide-angle rectilinear lens.—Address, S. P. L. PHILLIPS, Photographer, Oxford House, East Croydon.

I will exchange two fine marine oil paintings, size of canvas 32x18 inches, in massive gilt frames (*Sunrise at Sea*, by Nott; *Off Cape Race, Newfoundland*, by Haynes), for Ross' No. 3 portrait, or similar lens by any good maker. Also 9x7 single slide and focussing screen to match, by Mengher, for cabinet rolling press.—Address, W. P., Holmwood, Richmond Park-road, Kingston-on-Thames.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

J. GRAY.—The examples sent are very good indeed.

ALLAN.—We prefer acidulating with sulphuric acid.

J. W. PHILLIPS.—Varnish with Canada balsam and benzole.

ENLARGER.—Employ a sheet of ground-glass without any condensers.

J. S. NETTLEFOLD.—The address of the Willenden Paper Company is Willenden, Middlesex.

W. W. C.—Clearly your letter miscarried, as we have received no previous communication from you.

F. H. BURR.—The particulars could not have reached us up to the middle of November, else would they have been published.

F. G. S.—Although the orthographic will serve as an "all-round" lens, yet we would give the preference to one of the "rapid" series.

CAMSELL.—1. A nearly plain one, such as described in an article in a recent number. 2. A plain one, slightly shaded on the lower portion.

H. P. PETERS.—As it is a simple rule of three problem, a lens of twice the focus of any other will give an image twice the linear dimensions.

G. Y. G.—Under the conditions by which they were produced the transparencies are very promising. We should certainly advise you to continue your experiments to a successful issue. So far as you have gone the experiments are very interesting.

C. RICHARDS.—Are you sure that the spots proceed from dust? It is not usual to take all the precautions you appear to have done in filtering the air before it enters the drying box. Your room must indeed be a dusty one if six or eight thicknesses of fine gauze do not remedy the evil. We strongly suspect the spots proceed from causes other than dust.

P. D. R.—There ought to be no difficulty in changing such small plates as quarter size on board a steamship. Failing to obtain a suitable corner at night, a changing bag might be employed. As we are not familiar with that particular coast, we cannot express an opinion as to the quality of light there. The development of two or three trial plates will settle the question.

SPOTTING COLOUR.—Thymol or salicylic acid added to the albumen will prevent it from decomposition for a considerable time, so will a lump of camphor kept in the bottle. The colours mentioned will be very suitable if mixed judiciously. Perhaps, however, instead of the Indian red a madder lake would be preferable, as it would enable the colour of the photograph to be better matched.

A. F. M. says: "On page 269 of the ALMANAC I see a recipe for making a gelatine emulsion for opals, &c., without development. I should like to try it, but I do not see how the printing is to be managed, as of course one cannot turn back a sheet of glass as one does the paper to see how the printing progresses. Will you be so kind as to let me know, in the 'Answers to Correspondents,' how it is to be managed?"—Registering pressure frames are sold which enables the picture to be examined during the printing and replaced in exactly its original position. As an extemporary arrangement an ordinary printing frame may be used. In this case the negative is firmly fixed, say with gum paper, in one corner of the frame, then the opal plate is placed accurately on the negative and pressed firmly in the angle of the frame; it can then be examined and afterwards returned to its original place if the precaution be taken to place it accurately in the angle again.

CARNON says: "I made a solution of gelatine and chrome alum for fixing carbon prints on opal or ivory; after using I placed it in a bottle until further required, and now find it has set so hard that I cannot melt it again, even by placing the bottle in boiling water. Will you kindly say, in next issue of the JOURNAL, if it is necessary to make fresh solution for every batch of prints, or is there any way of making this usable? The following is the formula used:—A five-per-cent. solution of Nelson's No. 1 gelatine; add to every ten ounces of above one ounce of a twelve-grain solution of chrome alum."—With this proportion of chrome alum the solution should be made only at the time it is required, because after it has once set it becomes insoluble. The best plan is to keep the solutions of gelatine and chrome alum separate and mix them as required. If a small quantity of thymol, carbolic acid, or other antiseptic, be added to the gelatine solution, it may be kept free from decomposition for a long period.

WILLY EDELSTEIN writes as follows:—"About three months ago I worked a negative of Miss Gilchrist for Messrs. — on approval. I was to call and hear their decision, and did so twice. They still could not decide, and promised to come to me. I did not hear from them, so I wrote and asked them kindly to favour me with a reply as promised, but had none. I left London, and returned only last week for a few days, and saw the very photograph I retouched published in several different places. So I wrote to the gentlemen, and said that I was glad to see my work exhibited, and should still like to know the reason for their not answering and not paying me for the work as promised. Then they sent 4s., and said the reason they did not write was because they did not consider my work satisfactory enough. Now, do you think Messrs. — would exhibit a photograph that was not retouched good enough? Of course, I returned the 4s., and told the gentlemen that I could not possibly accept the pay for unsatisfactory work, as they considered it; but they have not acknowledged the receipt of it as yet."—If our correspondent's statement be correct, it is surprising that a West-End firm with the reputation of the one named should act in this manner.

NEMO writes: "I am much obliged for your answer to me in your last issue concerning a positive bath and developer. I have made both carefully according to your directions, but fail to get anything like a clear picture. The bath I have tested with blue litmus paper, which it turns pink (the amount of nitric acid being two drops to eight-ounce bath), and was carefully filtered. In developing, the picture appears in a few seconds, and before any detail appears in the shadows I wash well and fix (cyanide of potassium, quarter of an ounce; water, ten ounces). As the picture is being cleared by the cyanide solution numerous streaks and comets make their appearance, otherwise the pictures would be all right. I cannot put these streaks, &c., down to the collodion, as I was working with a fresh bottle at the time. I may add that these streaks do not appear to be refuse solution flowing down the plate from the wire corners of the carrier, as more often than not the corners are clear while the centre is nothing but a mass of streaks and comets. To the developer I added one ounce and a half of alcohol (methylated). Is this about right, or should I have used absolute alcohol? If so, about what quantity would you think sufficient? I should be much obliged for any information that would help me to get over this little difficulty."—The comets, like the streaks, may proceed from different causes. The former may be due to floating particles in the collodion. After iodising this should be allowed to settle for a day or two and then carefully decanted before use. The comets may also arise from particles in the developing solution. In this case filtration is the remedy. The streaks are most probably due to the plates being removed from the silver bath too soon. Methylated spirit will do quite well for the developer, provided it be free from gums. If any gum be present it will very likely cause trouble.

RECEIVED.—Transactions of Leeds Photographic Society; J. W. Blase; F. Barber, and others.—In our next.

We have also received a sample bottle of Holmes's photographic ozone, a well known and highly appreciated agent for reducing the density of gelatine negatives.

MR. WILLIAM TYLER has favoured us with an opportunity of examining his metal dark slides. Although rather heavier than wooden slides, they are quite light-tight and ought to be very durable.

PHOTOGRAPHIC CLUB.—The subject for discussion at this Club, May 18, 1887, will be *The Production of Lantern Slides from Large Negatives*. Saturday afternoon outing at Highgate. Meet at Archway Tavern near two o'clock.

TRADE CATALOGUES.—Within the past few days we have received several trade catalogues, including those of Mawson & Swan, W. Wray, the London Stereoscopic Company, Lancaster & Sons, and others. These we shall notice next week.

MESSRS. HORNE, THORNTON, & WOOD have shown us a model of a shutter they are about to bring out. It acts on a principle similar to the Grimestone, of which we gave a full description a short time ago, only the motion is given both up and down by rubber bands instead of by an adjustable metal spring.

MR. C. A. FERNELEY, Reigate, sends us examples of his photographic practice in and around Reigate during winter, the ground being covered with snow. Mr. Ferneley designates them *melanographs*, from their colour. Although small they are good, and are printed on bromide paper, which lends itself well to winter scenery.

We have received a copy of the *Handbook and Guide* issued in connection with the Cyclists' Touring Club, which is compiled and published annually by Ernest R. Supton, Secretary and Editor of the *Monthly Gazette* (140, Fleet-street, E.C.). We are glad to perceive that about three hundred and fifty of the hotels under contract with the Club have been induced to set aside a dark room for the use of such members as are photographers.

CORRECTION.—In our notice of Mr. Roberts's nocturnal photographs of *David Garrick* we spoke of his having followed the example set by Mr. Hyslop. "But," writes Mr. Roberts, "the 'example' is the other way round. My pictures were first taken on March 9, and were exhibited at the Camera Club on Thursday, April 14. (Why no mention is made of them in the 'Club Proceedings' under the report of that evening's meeting I do not know.) May I therefore ask that you will do me the favour to insert this correction?"

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1411. VOL. XXXIV.—MAY 20, 1887.

PHOTOGRAPHING FLOWERS.

PHOTOGRAPHING flowers and other small, inanimate objects, is becoming more and more a favourite pastime amongst amateurs, who, taking the cue, no doubt, from the numerous professionals who utilise such subjects for Christmas and birthday cards, find in them an endless variety of studies and a good deal of pleasant amusement, which, moreover, do not encroach very greatly upon either time or purse as an extensive landscape practice is apt to do. For those who elect to set up a speciality of this description nowadays, every facility is afforded by the modern gelatine process, which is far more than can be said of the wet collodion plates of a former era; and when such a line of practice is well and properly worked, and really first class results produced, it is quite as likely to attract the notice of the judges at the various exhibitions as are the conventional landscape, portrait, and architectural subjects which the great majority of photographers affect. Witness the numerous medals which have gone to flower and similar subjects at Pall Mall and elsewhere during the past few years.

From the numerous inquiries we are constantly receiving, we are made aware that great and serious difficulties exist, at least, in some quarters, in connection with the carrying out of this kind of work. Some few of these may be, no doubt, real, but we cannot help thinking that by far the greater portion are purely imaginary, and arise from deliberate neglect of the most elementary rules of common-sense on the part of those who make them. At any rate, work which was really difficult in years gone by is simple in the extreme with gelatine plates.

Some years ago we were consulted by an amateur friend, who was more deeply versed in entomology and conchology than in the mysteries of the camera, on the subject of photographing a large number of butterflies, moths, and shells. Our friend was himself the possessor of extensive collections of these various objects, and had, in addition, secured permission to photograph the objects in such classes in a large museum on the ordinary "students" days; and his idea was to publish a sort of catalogue of English and foreign butterflies, moths, and shells, illustrated by means of photography. Upon the probable value of such illustrations we need not at present dwell, suffice it to say, that after a very brief experience of the best that photography could do in rendering into monochrome the brilliant hues of tropical *lepidoptera* and the delicate pinks and yellows and browns of the *concha*, our friend determined to relinquish the task as hopeless, if not Quixotic.

Much of the colour difficulty then experienced has been overcome by gelatine plates even before the advent of orthochromatic films; but, quite independent of the incorrect rendering of yellows and blues, the extremely long exposures required, even

under the most favourable circumstances of light with some of the subjects, when wet plates were used—the most rapid by far then available—promised to render the task an almost interminable one.

But, in addition to what we may term the chemical and chromatic difficulties, there were others experienced in lighting the objects, and also in securing proper perspective; or, what it really amounted to, in obtaining *undistorted* reproductions of the originals. Besides these, there arose the difficulty of securing sharpness of the whole object unless an extremely minute stop were used. These last troubles were purely optical, and were owing to the fact that our friend's only lens was a portrait combination of short focus—in fact, a quarter-plate lens of four and a half or five inches focus. With such a lens, to attempt to reproduce in many cases almost, or fully, natural size an object in high relief, such as a heavy-bodied moth, was to apply it to an altogether wrong purpose, and it is scarcely to be wondered at that distortion and want of sharpness were the inevitable results. Then, again, with regard to the lighting, the shadows cast by the wings and bodies of the insects, and by the convolutions of the shells, were so heavy as to altogether destroy the form of the objects in their reproductions; and it was only when a box was "rigged up" to represent a small studio, giving as nearly as possible all front light except what was reflected equally from the four sides, that the obnoxious shadows were got rid of. But this, once more, added greatly to the time of exposure.

This, we must repeat, occurred with wet collodion, the sensitiveness of which to extremely feeble radiations is greatly inferior to that of gelatine. With modern plates under similar conditions we do not think the same difficulty would be experienced, for though the shadows would be cast, they would be rendered in a manner so subservient to the main object that their presence in the picture would cease to be objectionable.

From butterflies and shells to flowers appears at first sight a wide step, but it is not really so in this case, the facts and circumstances being in a measure identical. Colours as vivid and as varied, shades and *nuances* every whit as delicate, are to be found amongst our British flowers as amongst the most gorgeous of tropical insects; and we are met with this additional difficulty, that no matter how pale or delicate the blossom, it is invariably surrounded or accompanied by foliage of a more or less sombre green. There lies, in fact, the chief colour difficulty of the present day. Thanks to the introduction of orthochromatic plates, the due rendering of the blues, greens, and yellows is made comparatively easy; but the simultaneous reproduction in all their delicate gradations of the leaves and

blossoms of such flowers as camellias, gloxinias, and many of the orchids, forms the rock upon which most beginners in flower photography split. The common hawthorn, as well as such blossoms as those of apple, peach, and pear, are less difficult on account of the comparative lightness of the young foliage that accompanies them; yet to many they form almost insurmountable obstacles, though really perfectly easy if properly handled.

The optical difficulties of flower photography are also similar to, though perhaps greater than, those already alluded to. As in the previous case, the object is subject to but little reduction in the process of reproduction, and presents an even wider range of planes in proportion to the focal distance of the lens. Consequently, the difficulties of perspective and of securing an even focus are, if possible, greater in the case of flowers. We are not of that class who, on the ground that the eye only sees one object at a time sharply, hold that if the principal object in a picture be in focus, the artistic effect is enhanced by surrounding objects being more or less blurred. Such an argument may form a good excuse for a defective lens, or for want of care in arranging or focussing the subject, but it is illogical. True, the eye can only define sharply over an extremely limited area at one time, but it can direct itself, or be directed, to any part of a scene or picture which it is desired to examine closely; but in the case of a lens defining over so limited an area that only one object in the picture is sharp, the eye and the sense are confined to that one object, and imagination must, in a great measure, fill in the rest. Better, one would think, to emphasise the central object in some more legitimate manner, and leave the eye to do its duty in its own way.

Whatever may be the opinion on this question in connection with general subjects—portraits for instance—we think there can be little doubt that the result of such treatment of a flower subject would be offensive in the extreme, and the endeavour of the operator should therefore be to secure the best general definition possible. We do not mean to imply that every leaf and spray, every curve and marking, must be equally sharp, but that there should be no sufficient falling off in definition to give a blurred and indefinite appearance to the picture. This result can only be satisfactorily attained by employing a lens of long focus, as in so doing the difference between the planes of the object is rendered comparatively less, and the lens therefore requires less "stopping down," while at the same time a more natural replica of the object is secured owing to the absence of distortion or exaggerated perspective. The difference, as compared with the use of a lens of short focus with a small stop, is much the same as examining the object at a natural and comfortable distance and straining the eye to view it at extremely close quarters. Mr. Henry Stevens, whose large flower studies have been admired at various exhibitions during the past four or five years, owes much of his success to the employment of a lens of long focus.

We do not profess to lay down any rule on this point, but for our own practice we employ for a half-plate—a cabinet-sized picture—a lens of fifteen inches focus. If we resort to figures some idea may perhaps be formed of the difference likely to be produced by this lens and, say, one of six inches focal length. Suppose we wish to photograph a vase of flowers measuring twelve inches in height, and desire that it shall occupy four inches in the picture, or a reduction to one-third. With the fifteen-inch lens the camera, or rather the lens, will have to be five feet distant from the object, and the total distance between the object and the plate will be nearly seven

feet. With the six-inch lens, however, the distance from the object will be two feet only, and the total separation of the object and plate thirty-two inches. If a vase of flowers be examined with one eye closed at these two distances, the difference in the pictorial results will be at once recognised, and this takes no account of the improved optical conditions that prevail in the use of the longer focussed lens.

The next question is that of lighting, a much easier task nowadays, as we have hinted, than formerly. We have made comparative tests in the open air, under glass, and in an ordinary room, using the same object as well as the same lens and degree of reduction, and must emphatically give the preference to the last, when proper precautions are taken. The open air is for certain reasons out of the question for successful results, even if a vast flood of top light were desirable, for the weather is rarely such in our country that a spray of delicate flowers would remain undisturbed by air currents for a sufficiently long time to impress the plate satisfactorily. It is quite true that under the circumstances extremely short, even "instantaneous" exposures, may be given, but, as we shall show in treating of exposure and development, such conditions are not desirable.

Neither out of doors nor under a glass roof are altogether pleasing results produced owing to the amount of top light, which gives to the object an aspect under which it is unfamiliar to us, unless, indeed, we are accustomed to seeing vases or grouped sprays of blossoms in the conservatory. For single plants in pots or grouped under conditions in which they are likely to be seen under glass, the glazed roof may be used; but even under those circumstances we think better results are secured from a side and front light, with no more top than is gained from the height of the side light.

To gain this result the camera and object should be arranged in a line parallel with the window, the object being set back so that the light falls upon it from the window in an oblique direction. The further it is set back from the window in the direction of the axis of the lens the more will the illumination partake of the character of front light and the less necessity will there be for the employment of reflectors. The further the distance is increased in a direction at right angles from the window the less will be the contrast between the light and shadow side, the position being otherwise unaltered.

It may be observed that when the flowers are arranged in vases or vessels possessing highly reflecting surfaces it is desirable to remove the object as far as possible from the window, in order to reduce the patch of reflected light which will inevitably appear. This, if not too large, adds a finish to the picture, but if glaringly prominent it becomes offensive. If the containing vessel be of such a shape or nature that the window sashes or bars are reflected, these must be hidden by hanging tissue-paper over the window.

A large sheet of white cardboard should be at hand to act as a reflector to light the shadow side of the picture and to pick out the details in the interstices of the foliage. If a simple stand to hold the reflector at any angle be provided, so much the better; but it can be very well manipulated by hand, and in some cases where it is necessary to keep it in motion this is preferable. For some purposes, for instance, lighting up the shadows of heavy foliage, a small hand mirror is useful if direct sunlight can be caught by it; or if carefully used and manipulated so as to cast as little shadow on the background as possible, a short length of magnesium wire may be burnt as an auxiliary light.

The subject of exposure and development, together with a consideration of the employment of orthochromatic plates, must be left until next week.

AN AMERICAN DETECTIVE CAMERA.

HAVING recently received from the United States one of the most perfectly designed and executed detective cameras we have yet seen, we believe that a brief account of its construction will prove of interest.

Premising that it emanates from the Scovill Manufacturing Company, of New York, which is a voucher for excellence throughout, we observe that its general appearance when carried in the hand is that of an elegant case or cabinet richly covered with black morocco leather. Its dimensions are $10 \times 8 \times 6$ inches. Such is its appearance as a whole that it may be carried about in the hand in the streets, or in the railway carriage, without exciting the slightest suspicion or even attention.

On opening the lid it is seen that this unsuspecting-looking cabinet contains a 5×4 camera, with a set of three double dark slides, and that the lens is covered by a rotating ebonite shutter propelled by a steel spring, the tension of which is regulated by a lever operated from the bottom of the case. Indeed, the whole operative system as regards the placing of the shutter on whole or half cock, the discharging of the same by touching a button, the regulation of the rapidity of action, and the alteration of the focus (the normal adjustment of which is set for distant objects), is worked from below the outer case, and under such facile circumstances as not to necessitate the operator looking down when a shot is about to be made. A touch of the finger on the end of a lever cocks the lens shutter, by a similar touch it is discharged, no action of the hands which would excite notice being observed.

There are two finders: one on the top of the box for use when the plate is placed vertically, the other on the side for employment in the horizontal position. Each of these finders is composed of a lens, a diagonally placed mirror, and a tiny ground-glass, the ground-glass being brought nearly flush with the case and neatly covered with a sunk flap of leather, which, when raised, reveals on the ground-glass an image of the subject to which the camera is directed, which corresponds with that which would be flashed upon the sensitive plate by its own special lens were the trigger touched at that moment.

The lens, proper, is one of nearly six inches focus, and its normal position as regards the plate is such as to have every object, from extreme distance to those at a certain distance from the standpoint, sharply defined. But the back of the camera is provided with an adjustment, actuated by a lever—one of a focussing class of levers introduced by the Scovill Company several years ago—and by which a considerable movement of its end effects only a small movement of the camera back, being, in short, a species of “fine adjustment.” Its use may be briefly described in this way: When the lever is pushed as far as it will go in one direction, every object from extreme distance to beyond say, thirty feet, will be sharp. But if the object to be taken be within this latter distance, such as when a scene on the middle of a street is to be taken from the side pavement, one of two things will be necessary, either that a smaller stop shall be inserted into the lens so as to increase its depth of defining, or penetration, or then that the end of the adjusting lever shall be moved slightly towards the back of the camera, the precise distance being accurately determined by

certain marks or scratches made upon a plate on the bottom, graduated to suit any required distance. In this way objects situated within a few feet of the lens may be brought into perfectly sharp focus, even without the necessity being experienced of introducing a stop or diaphragm to give depth of definition.

When an instantaneous “shot” is to be taken at any object, the cabinet, which is being carried in the hand, is raised, and almost simultaneous with this movement, or prior to it by preference, the sliding safety cap of the lens is removed after “cocking” the exposur, the finder flap is lifted (all these operations being effected in two or three seconds), the finger placed on the exposing button, and the eye directed towards the finder. The object being seen in the centre of the finder, the button is pressed (which is accompanied by a faint click), and all is over. The dark slide is reversed for the next picture, the shutter is withdrawn, the lid closed, and the possessor of this tale-telling instrument moves unsuspectingly among his fellows ready for whatever next presents itself.

A ground-glass, with a peep hole behind, permits of the instrument being employed in the usual way when taking views, groups, or portraits other than those which fall in its way as a detective. To this end facilities are afforded for erecting it upon a stand.

The range in degrees of rapidity of action is very considerable. We have, when working the camera as a “detective” at its slowest, secured in the most perfect manner highly interesting scenes associated with the great fruit market in the vicinity of the office of this JOURNAL, all sharp and good; while we have also secured cabs rushing past in full speed to catch a departing train, or to deposit its living freight in time for the *matinée* at the Drury Lane Theatre nearly opposite, sombre although the atmosphere usually is in this portion of our great Metropolis.

Detective cameras although having their uses pretty fully developed in the United States—in New York in particular—have as yet had but a limited existence in this country, and all that we have seen have been of American inception, but we feel certain that before long they will be much more extensively employed. Their various applications, while too numerous to mention, will commend themselves to the reader.

THE STORAGE OF NEGATIVES.

THE best and most convenient method of storing negatives has always been one of opinion amongst photographers. To the amateur, who has only a hundred or two of negatives which he wishes to preserve, the case presents but little difficulty. A few grooved pine-wood boxes, each capable of holding fifty negatives, kept in a dry room, will fulfil all requirements. In these the negatives will be protected from the atmosphere, and if they and the boxes be numbered, any particular negative can easily be found when required. But with the professional photographer, who, perhaps, numbers his negatives by tens—or possibly by hundreds—of thousands, the problem is not so readily solved, and he who undertakes, as some do, to retain the negatives indefinitely, often finds his stock little less than a “white elephant.”

The principal conditions to be fulfilled when a large number of negatives have to be stored are these. The negatives should be so arranged that any individual one can be referred to without difficulty. They must occupy as little space as possible, and, above all, they must be well protected from

dust—which might result in scratches, moisture, and from atmospheric influences. For, notwithstanding that the negatives may be protected with varnish, moisture, as experience has proved, has more or less influence upon their stability if they be long exposed to its action. It is frequently said that gelatine are not so permanent as collodion negatives, hence they require greater care for their preservation. This, however, requires a certain degree of qualification. In collodion negatives the film is thin, and the image is very generally fixed with cyanide of potassium, which is much easier of removal than is the hyposulphite of soda. But even when hypo is employed with collodion a far less amount of washing is necessary for its removal than is the case with gelatine. But given the negatives, collodion and gelatine, with the hyposulphite thoroughly eliminated from each, there is no reason why the one should not be as permanent as the other, particularly if the gelatine one be treated with alum to render the film insoluble, provided, of course, no sulphuretted action has taken place in the fixing. However, it is not with the question of permanency that we are going to deal, but the most convenient and efficient method of storing the negatives.

For efficiency, nothing is much better than the grooved plate boxes. But when large numbers have to be dealt with, this system becomes expensive; and if, as is usually the case, the boxes are stacked one upon the other, it often entails considerable trouble to obtain any desired negative. Furthermore, when the plates have been badly cut, there is a difficulty in getting them in and out of the grooves. Grooved shelves, which at one time were largely used for storing the plates, are now seldom employed. Indeed, this is about the worst system that can possibly be adopted, inasmuch as the negatives are always exposed to the atmosphere, and any moisture it may contain, as well as to dust. Moreover, if the glass be badly cut, the same difficulty is met with as with the grooved boxes. Even if the plates are truly cut the weight of the glass in the upper shelves, pressing on the lower ones, often renders the negatives in them immovable.

Some photographers preserve their negatives by putting them up in parcels of twenty or so, with a piece of paper between each, and tying them round with string. This plan takes up but little space, and the negatives are well protected, but it is inconvenient when any particular one is wanted to obtain it, because a parcel has to be untied, the whole of the contents exposed, and then retied, the same operation having to be gone through when the negative is returned to its place. This trouble often leads to the package being left open, frequently for days, until the negative is done with, and this sometimes results in damage to the rest.

Many artists put each negative in a separate envelope, or into a paper bag, and store them in pigeon-hole shelves. This plan possesses many advantages; in fact, it is one of the best and most convenient that can be adopted. Each of the negatives is then well protected from dust, and when arranged in stacks, or piles, it is only the outside, or the topmost, one that has its envelope exposed to the atmosphere at all, except at the edges. Any individual negative can readily be obtained when required, and as easily returned to its place when finished with.

Here is a system we have seen in use for many years in some establishments. Each negative is neatly wrapped in a piece of glazed brown paper and numbered. The paper employed is the old-fashioned glazed brown of English manufacture, and not the material that is now often sold under the same name, of foreign make, which is of a far more porous character. The negatives,

in their paper covering, are stacked on shelves resting against the wall. The shelves have thin strips of wood fastened on the edges to prevent the plates from slipping off, and at intervals of half an inch, beyond the width of the negatives, are fixed narrow pieces of lath, to keep the different stacks apart from each other. A shelf of nine inches wide will hold about five dozen negatives in each stack.

There is a waterproof paper, resembling thin tracing paper, now in the market, apparently prepared with paraffine. It is employed by some manufacturers to pack dry plates in, and, extensively, by cheesemongers for parcelling butter and cheese. This paper, from its being waterproof, affords a safe protection to negatives from damp, and being thin occupies far less space than any other kind—particularly the glazed brown referred to. It is easily written upon, either with ink or a coloured pencil. Not the least advantage possessed by this paper is that, by reason of its translucency, the image can be distinctly seen without the trouble of having to open it. If the negatives be parcelled in this paper instead of the brown, a hundred can be stacked on a shelf of the width above given.

It is needless to say that the apartment in which the negatives—however well they may otherwise be protected—are stored, should be quite free from damp, and, by preference, it should be an inner room. If, however, this is not obtainable, an air space should always be left between the shelves and the outside wall. In no case should the negatives be allowed to rest against the outer wall of a house.

CONSIDERABLE interest attaches to certain recent exact experiments in regard to the atomic weight of gold, a question to which for years past some uncertainty has clung, owing to the exceeding instability of the various compounds of this metal. But by means of a compound of gold potassium and bromine Professor Thorpe and Mr. A. P. Laurie have been able to arrive at great certainty and exactitude in their calculations. The old atomic weight for gold was 197. Some later authorities (followed by us in our ALMANAC) have given 196, and now the above-named experimenters give us 197.28, if we take oxygen as 16; or if the now commonly accepted Stass value 15.96 be taken, that of gold becomes, according to Messrs. Thorpe and Laurie, 196.85.

IN our contemporary, the *Chemical News*, a complete series of the various specifications of the various patents in connection with the Auer von Welsbach incandescent gas light is given, and from them we learn that, contrary to the common idea, pure zirconium is not, even in the first patent, claimed as the sole material for placing in the flame to be rendered luminous. Herr Walsbach employs the oxides of both lanthanum and yttrium along with the zirconium oxide, and gives the best proportions to use, and also a proportion for the mixture of zirconia and lanthanum, without any yttrium. In his next patent he claims the use of thorium, and states that when used alone the hood is rigid, although the admixture of one part with two of magnesia is flexible when incandescent. He further gives details of the mode of giving various colours to the lights by means of varying the proportions in which these rare earths are mixed together. These being mostly in the range of non-actinic colours are of little interest to photography, and we therefore do not quote them, but in regard to a light of great brilliancy and whiteness, such as the inventor states to be produced by the use of a gauze composed of a mixture of the first three-named metals, there can be no doubt that it should be of the greatest value in portraiture if capable of production on a large scale. Electric lighting is of course unsurpassable, but it is entirely beyond the range of most photographers; an installation, however, of incandescent gas-burners giving a good actinic light might give photographic effect of value quite incommensurable with the modesty of its claims.

Those landscape artists who desire to obtain early spring effects should lose no time in securing them. The continued cold weather has caused a late spring and kept the leaves back, but the few warm days we have had of late has brought them forward, almost with a rush, and on some trees already they are showing signs of beginning to darken towards their summer tints. Judging from present aspects, what is known as spring foliage is likely to be of short duration this year. Just now some charming effects in landscape photography may be obtained which cannot be taken at any other period of the year. It often happens that it is impossible to obtain a good picture of many old country churches or buildings, owing to their being obscured by trees when the foliage is on, and if they be taken when the branches are bare the photograph always possesses a barren and wintry aspect. Such subjects can, however, be successfully taken before the foliage has acquired such proportions as to hide the structure, consequently the pictures so taken will, of course, possess a far more pleasing appearance than if the trees were devoid of foliage.

In the Patent Museum, South Kensington, is to be seen some interesting examples of early photography; they consist of some five or six dozen whole-plate portraits of scientific celebrities taken thirty or more years ago by the, then, firm of Maull & Polyblank—the first house, we believe, to publish celebrities. Although a very large proportion of the prototypes have long since been gathered to their fathers, the portraits still endure, and are in various states of preservation. Some appear to have undergone but little or no change, while others have become painfully yellow in the lights and half tints. But, notwithstanding this, the detail, even in the worst of them, is still there. A curious thing in connection with these pictures is that the ink, with which the names of the illustrious sitters are inscribed on the mounts, has, in many cases, proved less permanent than the photographs, it having changed to a pale, sickly yellow. It is to be regretted that these valuable portraits are not copied, and printed in a permanent process before they undergo further change. Every practical photographer is fully aware that photographs which have simply become yellow, as these have, copy much better than their appearance would lead many to imagine, and if orthochromatic plates were used, excellent reproductions, we are sure, could be obtained. It would, indeed, be a pity that these valuable portraits should be lost to the nation.

MANY would probably like to know how these photographs, which have endured so long, were produced, inasmuch as they were made at a time anterior to the introduction of the present method of alkaline toning. This we have ascertained from a reliable source. In the first place, the negatives were made with simply iodised, not bromo-iodised, collodion, and sensitised in a nearly neutral bath. They were developed with a solution of pyrogallic acid, restrained with acetic acid, and not with the iron developer now employed with wet collodion. The negatives, it may be mentioned, were made much more vigorous than is customary now. The prints are on albumenised paper, strongly salted—that is, according to present ideas—and sensitised on a correspondingly strong silver bath. The albumen used at that period was always diluted with water, consequently the surface of the prints is much less glossy than those on modern albumenised paper. For toning, the old compound toning and fixing bath—in which sulphur, no doubt, played an important part in the colouration—was used, while the washing was far less perfect than is usual at the present time. Notwithstanding this, these pictures, taken as a series, are in a far better state of preservation than are many which have been produced only during the past five or six years.

A NOTEWORTHY feature in connection with the above portraits is that they are all mounted on mounts embellished with bronze powder, and they appear to have suffered no injury therefrom. There are two gilt lines surrounding the portraits, and the name and address of the firm are also printed in the same material. In some instances it is difficult to see whether the imprint is in black ink or bronze, so much has it become discoloured. Clearly there is, or was, bronze powder and bronze powder, some of which has a fatally injurious action on photographs while others appear to be inert.

It would be interesting to know the number of cameras brought into use, by amateurs and professionals, on Saturday last, on the occasion of the Queen's visit to the East-End of London. At some points as many as half a dozen were to be seen at one time. It is rarely that such a favourable opportunity occurs for photographing a royal procession as that. The route was an unusually long one, and the light exceptionally good at the time. Some of the results obtained are really marvellous examples of instantaneous photography.

ONE of our daily contemporaries estimates the cost of the dresses worn by the ladies at Her Majesty's Drawing Room last week at something between sixty and seventy thousand pounds. It is not only the dressmakers and the milliners who profit by Drawing Rooms, as photographers come in for a large share of extra business on these occasions. As a rule, a very large proportion of the fair *débutantes* have their portraits taken in their Court dresses. Although a Drawing Room is always noted as a red letter day in the annals of West-End photographers, those held this year, we are informed, have brought them more business than formerly, this being attributed to the fact that it is "Jubilee year" and so many desiring to secure a memento of their introduction into society on that auspicious occasion.

COLOURED PHOTOGRAPHS.

RESPONDING to a request made by Mr. J. E. Mayall that we should witness a "private exhibition of my new process for producing highly finished coloured photographs without the aid of an artist," we went.

We are quite aware that some members of the general non-technical press have, in their ignorance of photography, designated this as something akin to the solution of the problem of taking photographs in their natural colours. But the colours, by whatever means they are prepared, or by whatever means they are applied (for the *modus operandi*, although patented, has not yet been divulged), have regard to the print itself rather than to the negative. This may be deduced from the title of the patent, "Printing and Colouring on specially prepared Porcelain or Paper; Silicon, &c., applied to secure Permanence;" and also from the following extract of a circular which was placed in our hands when visiting Mr. Mayall's studio, and which our readers are quite as able to interpret as we are:—

"The progress which has of late years been made in the methods of photography, and in the excellence of the work turned out, has undoubtedly been very great, and the photographer's calling has been transformed into a veritable fine art. Yet there is one thing missing to make the photograph really life-like and perfect, namely, a successful and thoroughly artistic process of colouring the same. The systems at present adopted are all purely mechanical and unscientific; and although many ingenious minds have of late devoted a great deal of study and time to the discovery of some improved process, these endeavours have until recently proved unsuccessful, and the defective method of mechanical colouring by means of the brush is still generally practised. It was reserved to a past master in the art of photography, who, at the same time, is an adept in chemistry, to solve the problem. Organic chemistry in its newest form is so little understood that it required a competent analyst, well up in the new methods of application both by the microscope and spectroscope, like Mr. J. E. Mayall, the eminent and world-renowned photographer of 164, New Bond-street, to achieve success where so many had failed. Mr. Mayall, in fact, treated the matter on an entirely new basis. Starting with definite and well-matured scientific principles, Mr. Mayall has been able to lay a foundation of pure chemistry in every portion of the process, building up a complete process by the laws of affinity that renders the subsequent production permanent and indestructible. The new method of producing coloured photographs invented by Mr. Mayall is perfect and brilliant in every particular. The coloured photographs thus produced, in fact, resemble high works of art, surpassing them even in the higher quality of vitality, each work representing a living presence of the original. To these excellent features must be added the great advantage that climatic influences have no effect upon the work. The importance of Mr. Mayall's discovery can hardly be exaggerated. When once the splendid results of the new process will have become known, there will, no doubt, be a general demand for coloured photographs on Mayall's system. It is, therefore, no exaggeration to say that the invention will cause a veritable revolution in photography."

Our readers may inquire, "What appearance do these prints

possess?" We reply, that they very much resemble prints coloured by the well known "crystoleum," "Grecian," or "Egyptian" methods, only that there is no glass to which they are attached. Perhaps a better idea may be given of their appearance by saying they look as if a proof on albumenised paper had been washed over with a liquid pigment, such as a transparent coal-tar dye, that the "washing" had been performed by a broad brush or very small sponge while the surface was wet, that the finer touches had been put in by a brush (although one of the gentlemen interested in this invention says that a brush is not employed), and that when thus treated the whole is protected by a coating of either collodion or something else, which forms a thin film over the surface.

Now, as we have said, we are in entire ignorance of what this revolutionary process really is (and it is quite possible that our surmises are altogether wrong), but at any rate, from what we have said, our readers will be enabled to form some idea of what the coloured photographs look like.

We are told by those who assume to know, that the pigments employed are permanent, and that a process of liquefying silic, long ago discovered by Mr. Mayall, has something to do with it, and further, that immersion in sulphuric acid will not destroy these colours. This, we think, will remove the "new departure" from any suspicion of the aniline, or more correctly, coal-tar pigments having a place in the invention, which we are glad of, these having a very shady reputation for remaining immaculate for any length of time under a bright light. From atmospheric influences they can be readily protected.

We are sorry that Mr. Mayall, when inviting the press to see his specimens and learn all about the process, did not consider himself at liberty to afford any information as to the nature of his invention. It was surmised by one gentleman who saw the specimens, that it was a modified crystoleum process, the pigments being applied behind a peculiar positive made by one of the more permanent processes, and then backed up by paper. This may or may not be the case; we have no real idea as to how it is done, but shall learn all about it when the specification is published.

THE LATE "MAJOR" RUSSELL.

WITH sincere sorrow do we learn of the death of Colonel Russell, so well known to photographers of a former period as Major Russell. The sad event took place on Monday last, the 16th instant.



Photographers are more deeply indebted to Colonel Russell than many of them are aware. Quite apart from the able and skilful

investigations he made in connection with the tannin process and in preservative processes in general, and of the action of bromide of silver, he has made photographers his debtors for ever by giving them the alkaline developer and making them acquainted with the influence of bromide in the developer. He was a prolific contributor to photographic literature in former times, but during the last fourteen or fifteen years had resumed the more congenial life of a country gentleman of independent means on his estate of Stubbers, Essex.

He was born in 1820, and was a scion of a family settled in Essex for over two hundred years. His family name of Branfill—a name we are pleased to say not unknown in the photographic literature of the present time—was changed to that of Russell in obedience to the provisions of a will of the last of a neighbouring and nearly related branch of the Russell family.

He made many discoveries in photography, into which field he entered in 1856. It was in 1862 that he first published, in these pages, what has been termed "a matured and practical method of alkaline development," based on phenomena observed by Mr. Borda, of America, connected with the exposure of tannin plates to the vapour of ammonia.

His latest contribution to photographic literature is to be found in our ALMANAC for the current year, in which, at the special request of the Editor, he wrote a brief and succinct account of his discovery of the restraining action of bromide in the alkaline developer.

The portrait we give of Colonel Russell was engraved from a photograph taken of him by the late O. G. Rejlander.

ON THINGS IN GENERAL.

The Right to the Negative question has, as I anticipated, produced a plentiful crop of letters, exhibiting every shade of opinion and dogmatism; it has really been quite interesting reading. But, as I said before, it can be examined from two standpoints—the legal and the moral—and if these two had been kept separate, or, which would have been far better, the legal aspect left untouched, the opinions expressed would have had more value. What possible use is there in a layman giving his views as to the probable legal ruling in a case as to which even in its moral aspect such opposing views are held? The latter position can, it appears to me, be best shown by putting a query, "If the question as to the ownership of the negative were to be raised frequently between photographer and client, and had to be solved, what would be the probable charge for the negative the photographer would make? Would he not in some cases name a price that should be prohibitive, and in others make none at all?" No photographer of high standing and reputation, I venture to say, would part with his negatives. The copyright of a photograph is vested by Act of Parliament in the producer if he go through certain formalities. That seems to me the most conclusive point as to the morality of the matter.

Unfortunately the Copyright Act at present in force contains no stipulations as to publication of portraits against the sitter's will, and only the common law can be invoked in the endeavour to prevent such an abuse of the possession of a negative as is described by Dr. Thomson in the correspondence columns (April 22). Photographers who are gentlemen will scarcely be able to read the account he gives without blushing for shame of their *confrères*. There are, however, too unfortunately, a large number of *mauvais sujets* in the ranks of the profession, though it is daily taking a higher position.

The battle of the diaphragms is again being fought with a vigour almost approaching to rancour—all, it seems to me, very uselessly. It may be that the recently proposed unit may have theoretical, even practical, advantages, but what is the use of a standard being adopted at all, if, although the selection occupied considerable time and the careful thought of men of experience, it is to be upset in a few years in favour of one assumedly slightly better, to be in its turn, I presume, again set aside for a still more nearly perfect ideal? The truth lies in a nutshell; we have a standard which is adopted here and on the Continent; it works well, and is easily understood. Why should it be upset to make room for a more cumbersome one, whose only recommendation would be that it was easier to cut out fresh diaphragms by it, or to reckon the value of the few old unsystematic ones still in existence? The lenses sent out in recent years are mostly fitted with systematic diaphragms on the uniform standard, and it is

quite certain that any possessed by photographers before the establishment of a standard that are still untabulated would remain so even though the shade of Euclid should revisit the earth to describe a perfect standard. Speaking for myself, I prefer the exposure ratio to be expressed by the smallest possible number; and when I am out photographing I find myself comparing time of exposure by numbers which are simply multiples of a unit, which I give to the full aperture of one of my battery of (slow) lenses. Thus I have a case containing a number of lenses, the full aperture of each of which is $\frac{1}{4}$. I don't call that No. 16, and a stop of $\frac{1}{4}$ No. 256; I simply call the full aperture "1," and then I know that the $\frac{1}{4}$ being one-fourth the diameter is sixteen times as slow, and I mentally term it No. 16. With three or four cameras at work at once on different subjects, as I had on a recent occasion, the value of simplicity is very severely felt; and this I say, though I am considered rather an expert at quick mental calculations.

Leaving now all these disputed points, it is a pleasure to turn to calmer subjects, and such I find in Mr. W. H. Harrison's cogent remarks upon the preservation of astronomical photographs. It would indeed be a catastrophe if, after the vast collection of star plates that it is now decided upon making had been brought together, they should deteriorate before being utilised. It will be interesting to note whether, in the published proceedings of the Congress, any account will be found of precautions taken in this direction. (By-the-by as, according to the published accounts of the Congress, "the estimated cost for each observatory, including instruments, *extra assistants*, plates, measurements, &c., is about four thousand pounds," I am curious to know what is done with used-up assistants: are they added to the residues?) At the same time I am bound to say I think Mr. Harrison's views are far too sanguine in another direction, when, coupled with the exceedingly good advice that the photographer out of work should train himself in drawing and painting, he assumes that six months' practice with pencil and brush, combined with theoretical study of art, would give him a facility of touch that would enable him to "sketch with a bit of charcoal in a few minutes a background to suit the appearance and occupation of any particular sitter." The power of draughtsmanship is, fortunately for the artists, not so readily acquired as to make a man of much value after only six months' practice. All the same, the principle of the advice is, unquestionably, both sound and valuable.

In the same number of the JOURNAL I see some very false advice given. A writer, Mr. John Bartlett (quoted from an American source) states inferentially that the eyes take no part in the expression of a face, and he refers to Bell's *Anatomy of Expression* as an authority. I should also like him to name the page in that work where the face he describes is to be seen. Any one with experience in portraiture knows that much of the failure to please that is experienced lies in the imperfect rendering of the expression of the eyes—by "eyes," of course, being meant the whole of the orbit. Most members of the fair sex when being photographed open their eyes unusually wide—I suppose to make them look large—and the result is the expression is ruined; for the muscular changes thus produced are the exact opposite of those needed for a smiling expression or a near approach to it. A smiling mouth and amazed or terrified eyes are in nature incongruous, and to artistic perceptions horrible.

Mr. Pringle, as usual with what he takes in hand, gives us some capital advice, this time upon developers; but what does he mean when he says sodic sulphite requires careful neutralisation with acid? Unless a crude commercial quality be employed, the photographer may add four ounces to an ounce of pyro, yet utterly disregard its presence so far as its developing action on the plate is concerned. Sulphite alone added to "pyro" solution, I know, will develop a negative, but it will take an hour or two, and will not affect the plate so much as a variation of five per cent., more or less, in the quantity of ammonia ordinarily employed.

FREE LANCE.

ACCESSORIES OF THE LANTERN.

CHAPTER VII.—THE FITTINGS OF THE READING DESK.

WE may now pass under review some of the plans that are adopted for the illumination of the lecturer's desk. The amount of light required for such a limited surface is very small, the light of one candle

being sufficient. As white paper is an excellent reflector, and throws back a large proportion of the incident light, it is evident that if too strong a light were cast on the lecturer's manuscript during a lantern exhibition there would be an appreciable fogging of the image on the screen, which would be highly injurious in the case of changing "effects," views of statuary, and similar subjects. Hence the maximum light permissible in a desk lamp may be stated as being that of four candles; the weaker the light is, so long as there is enough to read by, the better does it answer our purpose.

The railway carriage reading lamp is used by many persons—it may be obtained of ironmongers at a cost of about six or eight shillings; the light is that of a short paraffine candle, which is inserted in a tube fitted with a spiral spring to force up the candle as fast as it burns. The flame is surrounded on three sides by a bright metal casing, the fourth side of which has a hinged reflecting flap. The casing does not confine the light completely, as a large portion escapes from the openings on each side of the flap; this can be prevented by soldering pieces of metal on the reflector so as to cover these openings. The tube being very short, only a four-inch candle can be inserted; there is thus great danger of the light going out before an exhibition is over, and unless the candle is of a hard composition and of a certain diameter it is very liable to be forced through the collar in a softened state by the pressure of the spiral spring, and the heat of the lantern acting on the exposed portion speedily melts it. The result is that the bright casing is filled with soot on the upper part and grease on the lower, the light goes out a few minutes after being lit, and the lamp cannot be put in action again without a thorough cleaning. On the whole, the railway carriage lamp, though no doubt excellent for its own particular vocation, is not well adapted for our reading desk.

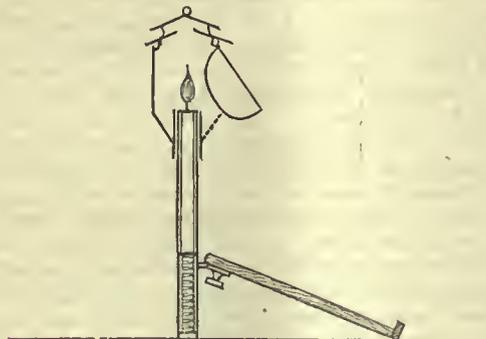
Another article, obtainable from the ironmongers, is the bull's-eye, or dark lantern, the price of which is about half-a-crown. The light is that of a small lamp burning colza oil. The arrangements for shutting in the light are of an excellent character, the chief alterations the lantern requires being the removal of the condensing lens and the fixing of a tin flap in its place, so contrived as to shut in all light except that proceeding in a downward direction. The lamp should also have a small brass cap to screw over the wick tube, to prevent the oil escaping when travelling. The lantern will then give an excellent light for the desk. The revolving inner shutter, which makes the lantern a "dark" one, is useful, as by its means every ray of light can be cut off when effects are being exhibited.

Many persons find oil lamps dirty and troublesome to deal with—if the oil is thick, as it often is in cold weather, it is difficult to get the wick properly lighted, and unless the top of the lamp is kept quite clean there may be an unpleasant smell from the heated oil—hence a paraffine candle is often preferred to a lamp as being cleaner and giving less trouble in use. There is in the market a cone-shaped reflector made to rest by its own weight on the top of a composition candle; as the candle burns the cover descends, so that the flame is always central. The cover is silver-plated within, and green japanned without, and is sold at about six shillings. They are not well adapted for a reading desk, though frequently used for the purpose, as the light is insufficiently confined; they are also liable to get out of order by the air passages being choked up with grease.

Turning now to lamps specially designed for the lecturer's desk, we find that both candles and oil lamps are used. Of the two systems, the former is to be preferred if the lantern is made so that paraffine candles, of eight to the pound, may be inserted without the necessity of cutting them into halves. A plan that can be recommended is an arrangement similar to the railway carriage lamp; the candle is enclosed in a brass tube, on the upper end of which is screwed a brass collar, or ring, against which the candle is forced by the pressure of a spiral spring. The case surrounding the candle flame may be made on the model of the bull's-eye lantern, with the lens replaced by a reflector hinged at its upper edge. A bit of silvered glass may be fixed inside the reflector, at such an angle that the light will shine on the upper part of the desk. An important point is the attachment of the lantern to the candle tube; this must be arranged so that a current of cold air may surround the tube at the upper end, in order to prevent the candle being softened by the heat of the lantern. The upper end of the candle tube should be encircled by a tube two inches

ong and three-eighths of an inch larger than the inner tube, so as to leave an annular space through which air can freely pass. The lantern is attached to this outer tube.

Our lantern being now completed, we have next to fix it to the desk. This may be done by means of a small brass plate, which is soldered to the candle tube about four inches from the lower end, and is fastened by a thumbscrew to the middle of the raised part of the board. This will bring the candle flame to a height of about six inches above the desk, which will then be evenly lighted.



Section of reading desk and lantern.

We have now to add to our desk some appliance for signalling to the operator at the lantern. The method that seems to find most favour is the flash of red light, which is obtained very simply—by making a small hole in the lamp cover, so that the operator can see the candle flame. This hole may be half an inch in diameter, and is glazed with a bit of red glass. Outside the lamp there is a strip of sheet metal joined at one end; when the lecturer requires a change of view, he lifts up this strip with his finger, and allows the red light to shine forth for a moment, then, releasing the lever, it drops by its own weight and covers up the hole again. As this signal is a noiseless one, it does not interrupt the speaker in his discourse. The operator has, however, to keep on the watch for the light; if his attention is diverted by a lime falling to pieces, or a gas bag slipping out of place, the red light is unnoticed by him, and some other signal is then necessary. There may be fixed underneath the desk board a small bell gong, with a very light clapper attached to a weak spring; this is adjusted to give a faint “ting” just loud enough to be heard by the operator. The bell and flash of light together form a very efficient signalling apparatus.

There are, however, other and better means of communication between the lecturer and operator. In places where the optical lantern is a permanent fixture, an electric bell may be used. In the old London Polytechnic the lecturer had only to press a button and the change of view instantly followed; the bell was in the lantern room and had its gong replaced by a wooden disc, which was struck by the vibrating clapper—the noise thus made was inaudible to the audience.

Electric bells, however, are not desirable additions to a travelling outfit; the ordinary limelight apparatus is quite complicated enough, without having to lay down wires and put batteries in order. The system of signalling by means of “cues” does not require any appliances whatever, and is well adapted to impromptu speaking; it is, however, a system that requires a little practice to enable the full benefit to be realised. The plan is simply to indicate, or hint, by a few words in the discourse that a fresh view is required. I do not mean a call of “Now then, Mr. Jones, let us have the next picture, please,” but simple sentences or phrases, previously agreed upon, such as “Proceeding on our tour, we arrive at,” &c.; or, “Our next view will give you an idea of—;” or, “We now leave this district, and—.” If a portrait comes next the cue may be, “I shall now have the pleasure of introducing—;” or, “I am sure you will recognise—.”

By having half a dozen or more set phrases such as the above, and ringing the changes on them, the audience will not notice the signals, and that bane of many lantern exhibitions—the periodical break in the lecture, and the waiting for the operator to answer the monotonous clang of the bell—will be eliminated.

When an instantaneous effect or change of view is required, as in the representation on the screen of the firing of a Woolwich Infant, the cue should be a syllable. If the lecturer intends to imitate the report by means of a pistol, the words preceding the cue should be said slowly and evenly, thus, “The gun was—then—dis-charged.” While the last syllable is being spoken, the operator throws on the effect, and the speaker pulls the trigger—the two actions being simultaneous.

ALBERT WM. SCOTT.

SUNLIGHT.

A YEAR or two ago, when Professor Langley brought that delicate instrument for measuring solar and other radiations, his celebrated bolometer, to the Royal Institution, and gave a description there of the work he had done with it, some surprise was felt that he did not exhibit the instrument at work, or do much more in the way of describing it than to call attention to a sectional drawing of the bolometer upon the wall. He made the mistake of under estimating the intellectual capacity of the auditory before him, and delivered a lecture more of an entertaining than a scientific nature. A few weeks ago, however, Professor A. W. Rücker, the successor of Dr. Guthrie at the Science and Art Department, South Kensington, gave a series of lectures at the Royal Institution upon *Molecular Forces*. Those lectures attracted an unusual amount of attention, because of the little known, except to specialists, scientific paths into which he led the listeners, and because of the way in which, with thorough knowledge of his subject, he laid bare the discoveries made in relation thereto down to the latest date. In one of those lectures Professor Rücker produced the bolometer, and stated that Professor Langley had tried to dissuade him from exhibiting it at work in public, because of the delicacy of the conditions required; indeed, Professor Langley had never tried himself to publicly exhibit it at work. The bolometer consists of a richly diaphragmed tube to check air currents, at the bottom of which tube are two groups of excessively thin iron or platinum wires. One of these sets of wires is screened from the action of the radiation under measurement. Professor Rücker, by the aid of a Wheatstone's bridge and a current of about one-tenth of an Ampere, measured the heat of a portion of the spectrum, obtaining, by means of a reflecting galvanometer, a sharp deflection several yards long of the spot of light upon the screen. Professor Langley, to check prolonged vibrations of the light needles of his galvanometers, has hit upon the ingenious device of obtaining air resistance by means of the wings of dragonflies instead of wings made of aluminium.

More recently, Captain Abney delivered a lecture at the Royal Institution, in the course of which he stated that Professor Langley a year previously had informed them that the sun would look blue if they could gaze upon it outside the atmosphere of the earth. Captain Abney added, with reason, that the sun under such conditions probably would not look so blue as Professor Langley expected, as excessively large additions of blue must be made to alter the appearance of strong white light. Accepting Professor Langley's own calculations, there would not be enough blueness to produce the anticipated effect. At the top of the Riffel, where the denser portions of the earth's atmosphere are below the observer, the sun does not look much bluer than when viewed from the lowlands.

In the course of this lecture Captain Abney gave the following figures as to the relative thicknesses of the earth's atmosphere through which the rays of the sun have to pass before they reach the earth, as the sun increases its distances from the zenith. The thickness at the zenith being called “one,” at fifty degrees from the zenith there is not much difference, and the thickness of atmosphere there may be represented by 1.5; at sixty degrees it is 1.9; at seventy, 2.9; at eighty, 5.5; at eighty-five, 10.2; and when the sun is in the horizon the relative thickness of atmosphere through which the rays pass is 35.5. I think the knowledge of these figures to be of photographic interest, because the more atmosphere the sun's light has to traverse, the more are the actinic rays suppressed in proportion to the others by the floating dirt in the air; this is why street gaslights look redder in a fog the more distant they are from the observer, as I have often pointed out in these pages. The figures also help to explain why as the afternoon wanes the light becomes weak for photographic purposes, while not much diminished in brilliancy to the eye; the difference in chemical intensity was still more marked in the old wet-plate days, for as plates increase in rapidity they usually increase somewhat in their orthochromatic efficiency.

In the present communication I am merely recording the work of others, and will conclude with extracts from my latest Royal Institution notes made but a few days ago, when Professor Dewar gave the

following information in the course of his present series of lectures of *The Chemistry of Organic Life*.

SOLAR RADIATION.

	Degrees Centigrade.
Top of Mont Blanc (Sorot).....	18.62
Limit of atmosphere.....	20.50
Limelight.....	0.40

The solar radiation is equal to fifty times that of lime at 2500°C. The absolute radiation of solar surface (Viollo) is 115,000 units of heat.

Light radiation, solar.....	72,000 candles.
" " electric arc.....	3140 "
" " limelight.....	120 "

RELATIVE LIGHT AND HEAT RADIATION.

	Light.		Heat.
Sun.....	30 per cent.	70 per cent.
Electric arc....	10 "	90 "

In relation to the storing up of the energy of solar heat and light, by the leaves of plants liberating oxygen from the carbonic acid in the air, and storing up the carbon as one of the components of the starch cells, Professor Dewar said that man and his works does not give off sufficient carbonic acid to sustain all the vegetable life on the globe, and that most of the carbonic acid used by plants comes not from animals but from sea water, for that water is rich in bicarbonates which give off carbonic acid gas in proportion to the amount of pressure of that gas in the atmosphere. In illustration of the ease with which some bicarbonates are decomposed, he put some crystals of bicarbonate of potash at the bottom of some water in a test-tube; then he by means of the air-pump began to exhaust the air in the upper part of the tube; the more he took off the air pressure the faster did the crystals give off carbonic acid gas, which at last came off so freely that the water in the tube appeared to be boiling. He gave the following particulars as to the first work done by sunlight in the leaves of plants:—

FORMATION AND DECOMPOSITION OF CELLULOSE.

Carbonic acid.	Water.	Starch cellulose.	Oxygen.
$6CO_2$	$+ 5H_2O$	$= C_6H_{10}O_5$	$+ O_{12}$.

One square metre of leaf surface produces 1.65 grammes of starch per hour, and absorbs in the process 4.68 units of heat. The total energy in the same time from solar radiation on the same area amounts to 622 units. The ratio of potential to available energy is 1 to 132. If the luminous portion of the spectrum be alone considered, the ratio is 1 to 33:—

Cellulose.	Water.	Marsh gas.	Carbonic acid.
$C_6H_{10}O_5$	$+ H_2O$	$= 3CH_4$	$+ 3CO_2$.

Professor Dewar considered it to be remarkable that enough carbon is obtained from the trace of carbonic acid gas present in the atmosphere to build up the vegetation of the earth, but in some instances low pressure favours chemical action, and that may have something to do with the matter. In illustration of the principle, he took a glass flask coated inside with a film of phosphorus; this was non-luminous in the dark until he lowered the pressure of the air in the flask by means of the air-pump; the phosphorus then began to emit light.

W. H. HARRISON.

THE FASCINATIONS OF PHOTOGRAPHY.*

WE will now turn to the fascination offered by what may be termed "home portraiture." Here it is again very great, as nothing is more natural than that we should wish to preserve mementoes of those near and dear to us—"to secure the shadow ere the substance fade," as the poet says. How often do parents wish they had a portrait of the little one who has been taken away from them, or a child yearn for that of a dearly loved parent. The practice of home portraiture need not involve any expensive outlay in the way of a studio, &c., unless desired, as by the judicious use of a white screen (a sheet thrown over a clothes-horse will answer) and reflectors (such as a swing mirror) excellent portraits may be obtained in an ordinary room. Moreover, home portraiture enables us to gain a better knowledge of the laws of light and shade and the actinic power of the light, by which the relative exposures for the various rapidities of plates may be learned.

To those who can adopt or adapt a studio, a wide field of pleasurable results is open, as by its use character sketches or studies may be arranged and photographed in every conceivable style. We are also better able to regulate the light to our requirements, as it is evident

* Concluded from page 297.

that to obtain a portrait in the Rembrandt style the shadows will have to fall differently than for that of a full face. Again, suppose we are photographing a character group, entitled, we will say, "The Smugglers," the light will have to fall so as to throw long, deep shadows into the impromptu cave we have made from virgin cork, old stones, &c. To any one handy with hammer and saw a small studio need offer no very great obstacles in the way of its erection, and is a constant source of pleasure when done.

To those who have passed the rudimentary stage of photography, I would advise the study and practice of enlarging, either by day or artificial light, as by this means some of our choice "bits" may be made into beautiful works of art, the argentic bromide paper if properly developed giving that dull, matt appearance which is so much admired. After this comes platinotype and carbon printing, and for those engaged in the staple trade of this district, namely, pottery manufactory, I can conceive of nothing more likely to be of advantage and yield good results than the making of photographic enamels.

Photography has a great future before it. Already artists are using the camera as an aid to the brush, while its services to the military and scientific engineer are manifold. As a means of recording passing events we have only to look at the recent visit of the Queen to Birmingham, or of the unveiling of the statue of Mr. Campbell at Stoke. In this latter instance not only was an instantaneous picture of the ceremony taken, but had it not been for a few old photographs of the deceased gentleman, the sculptor would have had to depend entirely on a verbal description for his conception of the statue.

In furtherance of the ends of justice, photography plays a most important part, many a criminal having been identified by his portrait, and now that detective cameras are made the size and shape of a watch, or in such a form that they may be worn beneath the vest, this is all the more readily obtainable, as the person is not aware of being taken.

In the literary world, photo-lithography has established itself as a most valuable adjunct to book illustrating. And, in short, the value of a knowledge of photography is so great that I think we have only to wait a few more years before seeing its principles and practice taught in our schools, not only as an art-science by itself, but as tending to inculcate an artistic conception, and to give a correct idea of the laws of light and shade.

In concluding with a few practical hints to beginners, I must ask the indulgence of the older hands for the benefit of those who are not already acquainted with them. In practising portraiture it is as well to remember that a light blue or white dress by coming out white in the finished print detracts from the beauty of the face and makes it appear darker. Also that the roseate hue of the healthy cheek always comes out darker than it appears to the naked eye.

By the same rule, too, blue eyes are difficult to take unless well screened from the direct light, so that they may get less exposure. On the contrary, dark eyes, or those well sunk into the orbits, require plenty of light. Very few people's noses are quite straight (don't look at each other, gentlemen), therefore, find which way the nose is bent—if to the right the sitter should look to the left, and *vice versa*. If the sitter has a long nose, a portrait nearly full face will be better than a profile; if it is *retroussé*, or, in plain English, "turned up," get the camera higher than the sitter's head and tilt it downwards slightly, or the same effect may be obtained, as regards the nose only, by the sitter leaning the head slightly downwards. It is not every one's fortune to have a "rose-bud" of a mouth, but as it is a most expressive part of the face, endeavour to so form the lips that they will have the expression desired. Above all things avoid a meaningless smile.

In taking views, endeavour to have the principal object in the middle distance, and remember that a prettier picture is oftener formed by placing the camera at an angle of view instead of square to the front. Practice thoroughly with one stop and lens first, and when you have mastered the working details of this do so with the other stops in succession. In developing extra rapid or sensitive plates, have an extra loose piece of ruby glass to place in front of that in the lamp, and remove as development proceeds. With the cheap plates in the market, do not be afraid of using too much pyro—in most of the formulæ given double the quantity may be used with safety, and this without the resulting prints being harsh or chalky. When choosing mounts select those which will harmonise with the colour of your prints—many otherwise good prints lose much of their beauty by the inharmonious contrast in the colour of the mounts.

Finally, endeavour to give your pictures the impress of character—even as the works of the great painters bear upon the face of them the evidences of the master hand that has wrought them. Be not

satisfied with mediocre work, but let your motto be "Excelsior," and I am sure then you will never regret having been fascinated with photography.

W. E. LEFK.

LEEDS PHOTOGRAPHIC SOCIETY'S CONVERSAZIONE.

THE first *conversazione* in connection with the Leeds Photographic Society was held in the Fine Art Gallery at the Municipal Buildings. Coffee was served at half-past seven o'clock, and the members of the Leeds Private Orchestral Society played a number of selections. A large number of visitors attended, for whose further entertainment, after an address by the President (Colonel T. W. Harding), there was an exhibition of lantern slides prepared from the works of members of the Society, and a display of photographs, chiefly from the same source. The Leeds Photographic Society, concerning whose history something was said during the evening, now numbers about seventy-five members. The number of works exhibited in two rooms placed at the disposal of the Society for the purpose by the Corporation is 575, these being mainly contributed by the amateur members of the institution. With regard to the exhibition as a whole it may without hesitation be pronounced exceedingly creditable, particularly for a first attempt. A hurried glance around the rooms reveals the fact that the amateurs have by no means confined their attention to one branch of the art they delight in, but have laid themselves out to acquire skill in it in every direction. The bulk of the works have their originals in beauty spots of natural scenery, and the operators whose tastes lie in this direction have found their own county marvellously rich in "subjects." Other amateurs, and these a goodly company, have brought the camera to bear for the purpose chiefly of producing architectural illustrations. To such as these the remains of Kirkstall have charms which are simply inexhaustible, and other historic ruins like Fountains, have with less frequency but equally good effect, come in for attention. The marine views form a highly interesting collection of photographs, and display some strikingly good work. One small room is occupied by photographs taken by one of the professional members, Mr. J. W. Ramsden. These are chiefly enlarged permanent portraits of well-known local persons, but in addition there are exhibited two photo-medallions, both curious and interesting. In producing these a photograph is first taken, and then by means of a bichromated gelatine a mould is made, from which a cast can be taken in wax or other suitable material. The President deserves well of the Society and of outsiders for the loan of a series of instantaneous photographs, which are remarkable in several ways. These works are of German origin, being taken by Herr Auschütz, of Lissa, and are analyses of the movements of men, horses, &c. Each series comprises something like a dozen photographs, taken at almost imperceptible intervals. Thus, such actions as those of a man throwing a heavy stone, a stork settling upon a nest, and a horse taking a fence, are illustrated at almost every second of their duration, and with an amount of distinctness and detail really surprising. Colonel Harding's collection also includes a number of interesting photographs of Eastern scenes. If for nothing else a frame of some half-dozen Daguerreotypes would be useful in order to compare with photography in the present day, but Mr. S. A. Warburton (Hon. Secretary of the Society) exhibits such a frame here which has another element of interest, inasmuch as it contains photographs of several former Mayors of Leeds who flourished nearly half a century ago. Another set of pictures of importance for purposes of comparison consists of some silver prints from negatives taken by the old process some thirty years ago, and acquired by the Society by gift from the late Mr. W. Sykes Ward. There is also a fine combination silver print by Mr. A. Fordsmith, entitled *Fortune Telling*, printed from no fewer than six negatives.

In the course of the evening the President gave all the friends assembled a hearty welcome, and trusted that they might consider that the exhibition repaid them for the toil of ascending to the lofty regions which did duty, more or less unsuccessfully, as the Art Gallery of the borough. He hoped that within twelve months they would possess a Fine Art Gallery in every respect worthy of the town, and very much more accessible than that in which they were assembled. Meanwhile they were grateful to the Town Council for placing at their service those rooms, such as they were, and they would show their gratitude by allowing the exhibition to remain open to the public for about a fortnight free of charge. The Society was not a new one. It was founded in the early days of photography. There was a tradition, and he believed it was a reliable one, that it existed in 1850, a very few years after the brilliant discoveries of Daguerre and Talbot made photography practicable. Mr. Teesdale, one of the Vice-Presidents; Mr. J. W. Ramsden, a large contributor to the exhibition; and Sir Percival Radcliffe, were original members, and still retained their connection with the Society. He did not mean, however, that the Society had been in continual operation; for years it was in a condition of suspended animation, but now it was a successful and useful institution. This exhibition would probably be accepted as a sign of vigorous life. The members were principally amateurs, and it was chiefly amateurs' work that hung on the walls. That work had been well done, and in some cases not only did the photographs show considerable technical skill, but very great artistic treatment. Having referred to the instantaneous photographs, forming, as it were, analyses of rapid motions, and to the lantern slides, he thanked the company for the interest they had

shown in a Society which was doing a modest but useful work in the cause of art, and which might well claim support if only because round one common centre of interest it brought together men filling very different positions in life.

SAVED BY A NEGATIVE.

THERE is not much romance in the life of a photographer, yet I can vouch for one romantic episode during my connection with that profession.

In the year 1863, I had a lucrative practice in the populous city of Liverpool, and in addition to an extensive studio connection I practised outdoor photography very largely. This outdoor work formed my relaxation from the monotony of the studio and dark room, although I must allow that the change from one description of this work to another was often startling in the extreme and sometimes even terrible.

For instance, one day I would be enjoying the fresh country air and the beauties of nature, while photographing some lordly mansion and park; the next, under orders from the Dale-street Detective Office, I would be obtaining a ghastly negative of some unknown victim of foul play, such as the corpse of the unfortunate man, found one morning behind a pile of timber at the Canada Dock, his throat cut from ear to ear. Any one who has had such work to undertake, will allow that the word "terrible" is the only one to use in describing the operation. One day I would be engaged at work on some lovely landscape, all the surroundings charming to the eye and soothing to the mind; the next, at the Princess Dock Dead House, securing the features of the suicide or the last victim by drowning in the Mersey. One day enjoying the sea breeze while photographing some noble vessel; the next, at the bedside of "somebody's darling," securing a last memento of the loved one ere the grave claimed its own. The latter was to me a most trying ordeal, as not only had I to face the dead, but also the distracted and grief-stricken relatives, whose anguish in some cases was pitiful in the extreme.

One memorable day in 1864, I was called upon at the studio by a gentleman whose mournful look and sombre attire at once told me his errand, and, as I anticipated, he required my services at a deathbed. In a few words he told me that a photograph was required of his only child, a little girl four years of age, who had just been called away to that "bourne from which no traveller returns." The gentleman, a Mr. Aubrey, was a Liverpool merchant, living in Abercromby-square. I sympathised with him in his trouble, for he appeared heart-broken at the loss he had sustained, and his strong, powerful frame seemed convulsed with agony as he told me how his wife and himself had made their only child their idol. He told me of its beauty, of its little winning ways, of the dark cloud arising when the little one was taken suddenly ill, of its unexpected flight from this world, and with bursting heart, he related how the dear one fell into her last slumber, calmly and gently, with the closing day. With the few words of comfort I was able to impart, he left me, on the understanding that I would be at his residence next morning.

On the following day, having packed the camera, stand, dark tent, and other requirements in a cab, I drove to Mr. Aubrey's house. Abercromby-square lies just outside the busy city, and contains the houses occupied by the *élite* of this great port. Fine, noble mansions form the four sides of the square, while the centre is laid out as a miniature park, forming a pleasant recreation ground for the inhabitants. I soon found Mr. Aubrey's house, which was really superb in its decorations. An air of luxury and refinement filled the rooms, and they contained all that wealth could lavish on them. Mr. Aubrey introduced me to his wife, whose fair features, now clouded by her great sorrow, brought strongly to my mind the fact that Death, the great leveller, brings anguish to rich and poor alike—none are exempt. Both Mr. and Mrs. Aubrey accompanied me to the death chamber, and there, in her last sleep, lay their only darling. He had called her beautiful, and this was no fatherly exaggeration. I wondered not at their great sorrow, to miss for ever the sight of such an angelic face, to be obliged to consign such beauty to the tomb, seemed hard and cruel. In all my experience of portraiture (and I have photographed hundreds of children) I never came across such a wealth of beauty, and I never saw such colour in the face of a corpse.

Left to myself, I proceeded to fix up my dark tent for the preparation of the plate and development. I must here, with the reader's consent, draw attention to the fact that twenty years ago the sensitive gelatine dry plate was not in existence. At that time the plate had to be prepared on the spot, used while wet from the silver bath, and developed immediately, which rendered a dark tent needful in every case. At present, thanks to the giant strides the "black art" has made, the plate can be taken ready prepared, is infinitely quicker than the old process, and can be developed at any time. Had the latter been in existence at the time of which I write, in all probability my "life's romance" would never had seen the light.

Again taking up the thread of my narrative, I will proceed to relate my further actions on this eventful day. After fixing up the dark tent, I mixed the developers and placed the camera on its stand, facing the bed. I then proceeded to place the body in the position best suited for securing the features, raising it slightly so as to obtain a good light on the face.

Returning to the camera, I focussed the features sharply on the ground-glass screen, and then having prepared the plate and placed it on the dark slide, I slipped it into the camera.

I must here point out that it was my invariable custom to obtain two separate photographs on one plate, in case one turned out a failure. This was easily accomplished by having the dark slide so constructed that one-half only of the plate was first exposed, then by pushing a portion of the slide sideways, the other half was next exposed, thus obtaining two distinct photographs of the same object on one plate. Having given the necessary exposure to each half of the plate, I returned to the dark tent and proceeded to develop. Dashing the developer over the plate, I watched the two images slowly emerging, and I saw at once that the features on the first half were coming out much sharper and clearer than those of the other; but my astonishment was great indeed when the development having been finished, I found on careful examination that while the features on one half were perfectly and sharply defined, those of the other half were blurred in a most extraordinary manner, the face being quite indistinct and out of focus. Like a flash it struck me that *the body must have moved* while the second exposure was being made, and another glance at the spoiled negative showed me that it was not a side movement of the face but a forward one, *towards the camera*, that had caused the blurring. In a moment I realised the astounding fact that *the head must have been raised*, and that life, however little, still existed.

Not a moment was to be lost, so quickly dashing the negative into the fixing solution, I left the tent and rang the bell. On a servant appearing, I ordered some hot water, and while waiting for this, I emptied the water out of my portable cistern, used for washing plates, and by the time this was done the servant reappeared with the hot water, which I quickly poured into the cistern. Telling the servant to proceed at once for a doctor, I placed the cistern to the feet of the child, and soon had the satisfaction of finding that the warm blood was coursing through the veins. Not long after the doctor arrived, and I briefly related to him the occurrences of the last few minutes. He grasped the situation at once, and thanks to his rare medical skill, I soon had the satisfaction of seeing the now restored child breathing once more, and with every hope of defeating death, on this occasion at least.

I will not enter into the medical aspect of the case, further than to state that the child's supposed death was, in the opinion of the faculty, a trance of the rarest description, seldom found out of Spain or Italy, and that my disturbing the body, combined with the strong odour of ammonia used in the developer, had broken the trance, and that, too, at precisely the proper moment. I shuddered to think of this narrow escape from premature burial, and I was overjoyed that I had been the indirect means of saving the little one's life, and bringing happiness to the sorrowful home.

J. L. II.

—Rare Bits.

["A little learning is a dangerous thing." The writer of the foregoing, who cannot possibly have any practical knowledge of wet plate photography, imagines that ammonia is an ingredient in the wet collodion developer. The youngest apprentice could have informed him to the contrary. The story, otherwise, is good, and we may add that, of course, the girl grew up and married the photographer who brought her to life by the pungent odours of the "ammonia" in his ferrous sulphate developer.—Eds.]

Our Editorial Table.

THE PRINCIPLES AND PRACTICE OF PHOTOGRAPHY, WET AND DRY.

By Jabez Hughes.

THE fourteenth edition of this popular manual, revised and edited by J. Werge, has just been issued. It is refreshing to find that Mr. Werge has left a considerable portion of Mr. Hughes' original matter intact, for a more intelligent writer than Mr. Hughes never lived, and this renders the manual valuable, especially when superadded to Mr. Hughes' writings are those practical directions given by Mr. Werge, and by which the manual is brought up to the requirements of the present time.

WRAY'S CATALOGUE OF PHOTOGRAPHIC LENSES.

FROM this catalogue we perceive that Mr. Wray (North Hill, Highgate, N.) makes his rapid rectilinears with the nearly uniform aperture of $f/6$, with the exception of the smallest of that series, to which he gives the large opening represented by $f/5.5$, which should render this special instrument, the "back" focus of which is five and a quarter inches, specially valuable for instantaneous effects secured by drop-shutter or detective cameras. Mr. Wray has also still further developed his system of wide and narrow landscapes, of which it may be remembered we made favourable mention in our previous volume in connection with the abnormally large aperture at which they work.

CATALOGUE OF APPARATUS SOLD BY THE LONDON STEREOSCOPIC COMPANY.

WHAT with lenses, plates, and specialties of various makers, shutters, cameras, changing appliances, lanterns, and the other requisites in photography, not to speak of "sets" of apparatus, seemingly nicely put up in well-fitted boxes (we judge so by the engravings), it would indeed be singular if one experienced any difficulty in becoming the owner of all that could be desired for practising the art after a perusal of this handsome catalogue.

BREAKING WAVES.

By J. A. MOORE.

THIS is one of the finest photographs of waves that we have seen. The negative, which, we understand, was taken in the neighbourhood of Scarborough, seems not alone fine in itself, but the artist has adopted the expedient of printing it in pigments of such a colour as vividly to aid the imagination in realising that it is the sea itself upon which we are gazing, and not a mere photograph.

Department for Inexperienced Photographers.

LENSES: CONJUGATE FOCI.

NOT even the most inexperienced photographer can have examined the image on the ground-glass of the camera without observing that when a distant object is in sharp focus a near one is not so, and *vice versa*; or if there be a small party in a garden, and one is seated at a distance of six feet, and another at ten times such distance, that a sharp focus of either of them is obtained at the expense of the other. Why is this?

If a camera be directed to an individual seated in front, the lens will form a miniature reversed image of such individual in the air. This image will not be seen unless the rays of light were intercepted at the focus by some diaphanous body, such as a small column of smoke, in the midst of which the figure would be seen in apparent solidity of a certain kind. If, instead of smoke, the image was received upon a sheet of ground-glass, it would be obvious that where this glass intersected any special portion of the image in air such part only would be seen depicted in the highest degree of sharpness.

What we are seeking here to establish is that there is a relation between the varying distances from the lens of objects in front of it and the corresponding parts of the image behind the lens. This relation is a conjugate one, and is known as conjugate focus. There are, therefore, two conjugates—the object in front of the lens, or *anterior conjugate*, and the point behind, in which the rays from such object cross, in which the ground-glass must be placed in order to see the image sharply, or the *posterior conjugate*. In proportion as the object in front is brought closer to the lens, so does the posterior conjugate, or, briefly, the focus, recede from it or become lengthened, so that in this relation a lens has no definitely fixed position of focus at all—this being dependent entirely upon the distance away of the anterior conjugate, or object that is being focussed.

A knowledge of the subject of conjugate foci is useful under many circumstances, more especially in copying. And in this connection we may say that if a picture is to be copied its own size, the anterior and posterior foci will be similar, and that *each* of these will be equal to the solar or equivalent focus of the lens doubled. Thus, for example, if a lens of ten inches is to be employed, that is, one which would produce a focus of a distant object at ten inches, by bringing the object—which in this case is the picture that is to be copied—sufficiently near to form on the ground-glass an image the size of the original, it will be found that this condition of equality of dimensions can only be secured when the object is twice the equivalent focus in front of the lens, and the ground-glass precisely the same distance behind it. Hence, to make a copy of a picture with a lens of ten inches focus, the distance between the focal centre of the lens and the ground-glass must be twenty inches, the picture being at a like distance in front. A copying camera to reproduce a transparency from a negative would, therefore, for such a lens, require to be forty inches in length.

It would only trouble the inexperienced reader were we at this stage to inform him of the rules by which conjugate foci are calculated, so we abstain from giving any of them at present.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 7035.—"An Improved Magnesium Light for Photographic Purposes." Complete specification. J. GAEDICKE and A. MERTHE.—Dated May 13, 1887.

No. 7121.—“Improvements in the Method of Focussing the Object Glasses of Cameras and in Apparatus therefor.” Communicated by L. M. Berthon. G. DOWNSING.—Dated May 16, 1887.

PATENTS COMPLETED.

AN IMPROVED CONSTRUCTION OF ROTARY ALBUM SUITABLE FOR PHOTOGRAPHS, MEMORANDA, AND THE LIKE.

No. 4178. THOMAS WILLIAM NAGINGTON, Stone-street, and WILLIAM HUGH WARING, 214, Wolverhampton-street, Dudley, Worcestershire.—March 19, 1887.

THIS invention relates to a certain improved construction of rotary album suitable for photographs, memoranda, and the like, and has for its object to manufacture such an article in a neat and convenient form and of any desired size, but we prefer to make it in miniature so that it may be carried in the pocket. The album is constructed in two parts, being preferably a pair of circular or polygonal plates of metal, wood, millboard, or other suitable material, pivoted together at the centre, and each capable of revolution; in one, but preferably in both plates, an aperture of suitable size for displaying a photograph, making memoranda, or other purposes, is formed.

The photographs or writing spaces are placed equidistant from each other on the internal faces of the plates, so that by moving the outer plate right or left around the centre, when two apertures are formed two different photographs or fresh spaces for notes may be discovered, one at either side.

The claim is: The hereinbefore-described construction of rotary album, consisting of a pair of plates pivoted together and adapted on rotation to discover photographs, writing spaces, or the like.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
May 23	Blackburn	
" 24	Great Britain (Technical)	5a, Pall Mall East.
" 24	Bolton Club	The Studio, Chancery-lane, Bolton.
" 25	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 26	Liverpool Amateur	Royal Institution, Colquhoun-street.
" 27	Oldham	The Lyceum, Oldham.
" 28	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday, May 12, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. A. Mackie presided.

Mr. J. TRAILL TAYLOR gave an account of the position of photography at the Newcastle Exhibition.

The CHAIRMAN called attention to a statement in the *Daily News* that in Donegal there is only one photographer to 206,000 inhabitants, and that the district is a poor one.

Mr. TAYLOR said that he and another member of their Association who had been to Antrim some years ago had seen no photographer there at all.

Mr. A. L. HENDERSON stated that a few years ago there was not one at Bray, a fashionable watering-place near Dublin.

Mr. F. W. COX had been experimenting in developing old platinum paper with washing soda, which he thought gave as good if not better pictures than the hot oxalate bath; there was no advantage in using cold oxalate of potash; he had tried his experiments on a piece of the paper kept in a desk for eight months. He also took a piece of platinum paper two months old, held it in the steam of boiling water, then dipped it in cold water, and dried it at the fire before he placed it in the printing frame, after which he obtained a fair print upon it.

Mr. C. HEINRICH TRINKS had recently seen Mr. Henderson photographing the stage at the Royal Aquarium by artificial light, under trying circumstances, and with about three and a half seconds' exposures, getting fair results.

Mr. HENDERSON believed the exposures to have been about seven seconds. He exhibited a new centrifugal separator for amateurs, one turn of the handle of which would give sixty revolutions to the basket.

The HON. SECRETARY remarked that, there being no such thing as "depth of focus," he should like to know the proper phrase to express what was meant.

Mr. TAYLOR replied "depth of definition." He had suggested at an American Convention that one of the most perfect lenses possible would be one in which the elements should be separable at the will of the operator; it might be mounted in a kind of telescopic tube.

The CHAIRMAN said that photographers ought to have more power of altering their lenses. Mr. Furnell had once published a method of flattening the field of any particular landscape lens at will.

A question was asked whether in any instance reflectors had an advantage over refractors for any photographic work other than astronomical.

Mr. TAYLOR responded that they in no case gave an advantage. The meeting then broke up.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

A SPECIAL general meeting of the Association was held on the 5th instant to consider the proposed alteration of following rules:—Rule 4. Donors of one guinea and upwards shall be entitled to vote at general and special meetings, also at the election of pensioners, and shall further have the privilege of recommending for the consideration of the Committee cases of non-members, such as are defined as urgent in Rule 13. Rule 15 was altered to give the Committee power to act in such cases. Urgent cases are such as arise from

death, sudden illness, fire, or other unavoidable calamities; also when applicant has been out of employment for a length of time and requires aid to take a situation.

Mr. BEDFORD, in moving the resolution, said he thought this was a step in the right direction; donors would doubtless prefer that cases coming under their notice should be dealt with by an organized society, and would increase their interest in the Association; this would in no way interfere with the rights of members, but would give donors an opportunity of seeing that good work was being performed with their contributions to the funds. The Committee would still exercise its right to judge of each case upon its merits.

Mr. A. MACKIE seconded the proposition, which, after some discussion, was carried unanimously.

A committee meeting was then held. After the minutes of the previous meeting had been read and confirmed, Messrs. W. F. Benham, F. H. Carter, T. Sebastian Davis, and T. Newman were elected members.

A new handbill, briefly describing the objects of the Association, being now ready for circulation, the Committee desired to ask any feeling an interest in the work of benevolence to apply to the Secretary for a supply of the same, and aid them in their work by circulating them, and thereby bringing the Association under the notice of those who may not already know of its existence. The subscription being only two shillings and sixpence per annum every assistant should become a member.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE ordinary meeting of the above was held in the Free Public Library on Thursday evening, the 12th instant,—Mr. J. A. Forrest (President) in the chair.

Messrs. Thomas Comber, J.P., W. W. Rowley, Stewart Downs, and George Latimer, were elected as members.

Thornton's new patent camera was explained by the inventor. A tripod and shutter were also exhibited, the latter a modification of the Kershaw, but capable of giving time as well as exceedingly rapid exposures.

Pumphrey's card-mounted flexible glass films were exhibited in their various stages of the process, and the *modus operandi* of working explained by the SECRETARY (Mr. G. A. Carruthers). A number of various-sized negatives and prints therefrom met with much praise, and were pronounced fully equal to work done on ordinary plates, being free from granularity and in weight almost as light as paper.

Mr. Paul Lange showed an interesting series of platinum type views illustrating boat drill on board one of the Canard Atlantic mail steamers whilst lying in the Mersey. This drill takes place on each vessel the day previous to sailing, and is well worth seeing; it only lasts five minutes, but during that time twelve excellent negatives were secured, paper and roller slide being of course used.

Mr. LANGE stated that he had made arrangements for a steamer which would be placed at the service of the members of the Liverpool and Birkenhead Societies at an early date for a day's cruise on the Mersey. The trip will be free to all who wish to participate, but each person going must come provided with camera and plates. June 18 was suggested as a likely day, that being the occasion of the Royal Mersey Yacht Club Regatta.

The PRESIDENT informed the members that an invitation had been received from Alderman Sannelson, of Liverpool, inviting them to his residence at Trefriw. It was felt that advantage should be taken of this kind offer by a visit there during an early holiday, Trefriw being one of the most picturesque spots in North Wales, and not inappropriately named the Welsh Garden of Eden, with numberless pretty Jenny Joneses to pose as Mother Eve.*

An excursion to Chester on the 7th instant was productive of some fine pictures, principally about the old abbey and on the Dee, Mr. Lange doing good work with his detective camera and producing many charming and quaint street views.

Mr. F. N. EATON, a newly-elected member, exhibited a half-plate camera of his own construction and design, with all the latest improvements, which, for an amateur, was an excellent piece of cabinet work.

MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.

THE monthly meeting of the above Society was held at the Masonic Hall, Cooper-street, on Tuesday, May 10,—Vice-President, Mr. W. Stanley, in the chair.

The following ladies and gentlemen were elected members:—Mrs. A. Flower, Mrs. E. Furnivel, Mrs. J. Jones, Miss L. Furnivel, Mr. W. J. Bowden, Mr. H. E. Bythell, Mr. C. A. Davies, Mr. H. Duncan, Mr. E. Hinners, Mr. W. B. Kenyon, Mr. C. R. Lindsay, Mr. J. H. Taylor, Mr. J. Taylor, Mr. W. H. Tetlow, and Mr. Peter Woods.

A list of rambles for the season, arranged by the Council, was brought before the members, and the arrangements made by the leaders for this month's rambles announced. The list of places is as follows:—Worsley, Speke Hall, Millers Dale, Lymm, York, Chester, Alderley, Shrewsbury, Healey Dell, Dovedale, Rostherne, Middlewood, Haddon Hall, Biddulph Grange, Ingleton, Harlestone Crags, and Dunham Park.

The SECRETARY read a short paper on *The Society's Rambles*, mentioning the usefulness of these rambles as a source of photographic experience, and asking each and every member to study the list of rambles, and to try to make the rambles successful by personal attendance.

The LIBRARIAN announced further gifts of books to the library.

At the *conversazione* held after the meeting, Messrs. S. F. Flower, W. Greenwood, and J. R. Rose exhibited photographs of the triumphal arches erected during the Royal visit, and instantaneous photographs of the Royal party. Mr. J. H. Rigby exhibited a series of enlargements on Eastman's paper, 23x17 enlarged from full-plate negatives. The Secretary exhibited miscellaneous views; and Mr. W. Berry showed four prints from the one negative, each print being by a separate process, namely, one silver print, one

* What! In Eve's costume?—EWS.

carbon print, one on Obernetter's chloride paper, and one on Eastman's bromide paper.

On Saturday the first outdoor ramble of the Society took place under the guidance of Mr. G. H. B. Wheeler, to Worsley, whence the party proceeded to Drywood Hall, a fine sample of the magpie style, remarkable for its fine overhanging porch. A good view of the front of the hall is easily taken from the lawn or tennis ground, and here the cameras to the number of thirty-five were soon at work. From here the party proceeded to the Warke Dam, where the members were allowed to use the private walks and drives. From the Dam the party went through the village of Worsley, where several views of the Court-house, &c., were taken. The day was fine, about fifty members and friends joined in the ramble, thirty-five cameras were used, and one hundred and ninety-four plates and films exposed.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The monthly meeting of this Society was held April 14, 1887.—The President, Mr. A. Coventry, in the chair.

The minutes of the previous meeting were read and confirmed.

The HON. SECRETARY, in compliance with a note handed to the President, read the rule relating to visitors, which stated that the same visitor could not be admitted more than twice in one session; but this rule did not apply to the popular meetings of the Lantern Section.

Mr. ABEL HEYWOOD, JUN., then read a paper, subject, *Odds-and-Ends*, and illustrated his communication by many stereoscopic pictures.

Mr. J. S. POLLITT then read a paper, subject, *On Stereoscopic Work* [this will appear in a future number], and he also illustrated his remarks by stereoscopic pictures and apparatus for making the same.

A discussion followed, and Mr. S. O'KELL described the method adopted by De la Rue in making his stereoscopic views of the Moon.

This was followed by a paper from the HON. SECRETARY (Mr. W. I. Chadwick), subjects, *Scarcity of Communications by the Members, and the Reason Why; On Outdoor Meetings; Presentation Prints; Professional and Amateur Photographic Societies; Encouragement to Young Members and Beginners in Photography; Grievances; SPEAK OUT*. He said as his communication was only intended for the members of the Society he did not think it desirable to publish it.

The above raised an animated discussion, in which Messrs. Mellor, Pollitt, and McKellen joined.

Mr. A. BROTHERS said he started as an amateur in photography many years ago with a cigar-box camera, &c.; he worked up and up until he became a professional, and was now an amateur again; and that during the whole course of his professional career he had always been most willing to impart all the knowledge he possessed to members of this Society except his secret processes, and that the photographic world was indebted to him for many "valuable ideas," amongst others, vignetting by tissue paper.

The HON. SECRETARY said his object had been attained; he thought the members required rousing up a bit at times.

Mr. Alan Garnett exhibited some prints and negatives on Eastman paper and the same subjects on glass.

The opinion of the meeting was, if the paper negatives were not so good as glass they were not far behind.

The last monthly meeting of the present session was held at 36, George-street, May 12, 1887.—The President, Mr. A. Coventry, in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. William Russell was elected a member.

The PRESIDENT said he had great pleasure to call upon Mr. George Smith (Scientific Company, London), who had come from London by special invitation to talk to them on lenses and landscape photography.

Mr. SMITH commenced his remarks by a description of his long-focus camera, and explained the principle of the area system as devised by him to the masking of photographic lenses and diaphragms in order to ensure accurate exposure. The camera was for $4\frac{1}{2} \times 3\frac{1}{2}$ plates, with a range of focus of over twelve inches, and was provided with a set of five lenses, all working with one mount, in which they interchanged at either end by a bayonet catch, thus making five single lenses and four rectilinear, together nine different foci. The lecturer protested against the abuse of wide-angle lenses, adding that he himself never employed one of less than four-inch focus for a three-inch picture (lantern slide), and showed a photograph of horses ploughing, taken by a professional for sale, which was a most ludicrous example of the strained perspective of a wide-angle lens. He also showed, among numerous examples of the work done with this camera and lenses, some which, though charming "studies," were unsuitable for publication as views of the places they were supposed to represent.

The simplicity of manipulation of the apparatus and its thorough rigidity at all ranges was fully appreciated by the members, while the specimens of work done with it testified to its efficiency. The total weight of the complete kit, including camera, four double dark slides, lenses, case, and stand, was said to be under seven pounds.

Mr. SMITH then gave his views on the development of gelatino-bromide plates, instantaneous photography, &c.

A long discussion ensued, and various opinions were given.

Mr. H. GARSIDE said he used probably more pyrogallic acid than any member present, and for a long time it had been his practice to fill up the pyro bottle with water alone. It *did* discolour, but he never found any injurious effect from the discolouration. He used pyro and ammonia with bromide, and his negatives were nearly all fully developed in a quarter of a minute, certainly half a minute was the maximum time in his own work. If, however, he was developing a negative of which he had no idea of the exposure, he would take a little longer—say, perhaps, a few minutes.

Mr. POLLITT, in proposing a vote of thanks to Mr. Smith, said, with regard to developing, every photographer of experience had his own ideas, but with regard to what Mr. Smith had said about lenses, he was sure we had all heard

a most interesting lecture, and the area system of Mr. Smith's was so far in advance of many of our members that he felt sure it deserved their careful consideration.

Mr. MCKELLEN seconded the vote of thanks to Mr. Smith in very complimentary terms, and thus an instructive and entertaining evening was brought to a close.

DERBY PHOTOGRAPHIC SOCIETY.

The members of this Society held their first outdoor excursion of the season on Saturday, May 7, when they assembled to the number of sixteen outside the General Post Office at half-past one p.m., and were conveyed by break to Dale Abbey, the route taken being (by the kind permission of Sir Henry Willmot and W. Drury-Lowe, Esq.), through Chaddesden and Looke Parks. The weather was fine till just before reaching the Abbey, when it suddenly changed and commenced to rain. However, the party decided to make the best of it, and accordingly a large number of plates were exposed on the Church and Guest House, the Hermitage, and the east window of the Abbey, which is about the only portion remaining intact of this once fine old structure. At about five o'clock the sky cleared again, and the sun shining brightly caused those who had exposed their plates to wish they had waited. However, those of the more fortunate ones who had still some left made good use of the weather. At half-past five the party adjourned to the Guest House, where tea had been provided, and after a group had been taken they returned to Derby. At the Church Mr. R. Keene read an interesting description of the place, for which he was accorded a hearty vote of thanks.

LEEDS PHOTOGRAPHIC SOCIETY.

The ordinary meeting of the Society was held on Wednesday evening, April 6, at the Grand Restaurant, Boar-lane, Leeds.—Colonel Harding, the President, in the chair.

Upon this occasion the members met together, at the invitation of Colonel Harding, and partook of an excellent tea. After tea a vote of thanks to the President for his hospitality was proposed by Dr. JACOB, seconded by the Rev. A. STANDIDGE, and heartily carried.

The PRESIDENT then delivered his Presidential address as follows:—

I have thought perhaps it might be useful on this occasion to consider how far this beautiful invention of sun pictures has been useful to mankind, how far it is likely to be an important factor in the great educational work of the future. And, in the first place, let me deal with a secondary branch of the subject, and, as an amateur addressing a Society of dilettante photographers, say a few words on the advantages of cultivating a knowledge of this art as occupation for the leisure hours.

Among the subjects which a man may take up for his recreation few offer so healthy a pursuit or so varied an interest as the one which we are now considering. The development of amateur photography within the last few years has been remarkable, and I hope that the approaching exhibition which we are to hold in Leeds will reveal what excellent results in various directions can be obtained by mere amateurs.

The invention of rapid and reliable dry plates, the facility and the cheapness with which the necessary apparatus and materials can now be obtained, the ease with which modern light cameras can be carried on excursions, the simplicity and comparative cleanliness of modern processes, have removed the barriers which in the earlier days limited to a very few the practice of what was then not inaptly termed the Black Art. Without much expense of time or money, without the exercise of exceptional skill, most of us can attain, if not to a high degree of excellence in our productions, at least to such a level as enables us to add quite a new interest to our family life, and to open a new field for cultivating a love of the beautiful.

In the interest of those who are beginning work, I should like to point out how useful it is to keep prints in chronological order in albums. Of course not every negative is worth representing, and even the affectionate regard of every amateur for his own work cannot save some negatives from well-deserved destruction; but a print from every set of tolerable negatives should be preserved, not in the inextricable confusion of a drawer full of curled-up prints, but by pasting it as soon as possible in the album, with a note of the date and any technical remarks as to exposure and condition of light as may appear desirable. Now, if the amateur is industrious in photographing himself, his wife, his children, his friends, his various surroundings, and especially if he travels much, these albums will become valuable volumes of pictorial biography and family history, full of delightful, if also sometimes of painful, interest, as children grow up to maturity, and loved faces pass away, recalling many scenes and circumstances which otherwise would be forgotten. Many pictures which at the time we thought little of, because it was a poor photograph, will be found after a few years to have quite other than technical interest. You will be surprised to find with what varied emotions you will look through some early volume, perhaps long laid by, in which, as you turn over its pages, you will see again the young wife and the baby, the children with the long-forgotten toys, or the once familiar friends strolling in the garden, or the simple arrangements of that first dwelling in which we remember having been so happy, or the jolly groups gathered together on that now distant birthday, or the simple portrait of some dear old man, not clad in the state garments and severe respectability of the professional picture, but just as we knew and loved him, sitting in the old arm-chair, with the well-worn dressing gown, and the spectacles, and the slippers, and the pipe, and the faithful dog not far away. For depicting and preserving such scenes as these the amateur will find his reward rather than in ambitious attempts to rival professional portraiture on a large scale and under conditions which are usually at great disadvantage compared with those of a studio. Indeed, the beginner will do well to exercise some caution in photographing his acquaintances. One incidental result may follow his attempts: he will probably attain to a better knowledge of the innate vanity of mankind, and realise the danger of letting our friends see themselves as others see them. The first condition of success for the professional is a knowledge of the art of successful flattery.

Landscapes, of course, offer a wide field for the amateur. The camera is useful in giving an indelible record for health-giving rambles, and teaches him to delight not only in the sublime aspects of nature but in the sweet nooks where she hides away her modest beauties, whose simple loveliness will often be found the most suitable for photographic representation. And I think that our appreciation of the beauty of nature is assisted even by the deep disappointment which we often feel over our photographic results, a disappointment which enables us to realise how subtle is the influence of colour, and how, under certain conditions of atmosphere and light, even a commonplace landscape may become as it were transfigured with beauty, like the face of certain so-called plain persons under the influence of noble emotions.

Passing on, gentlemen, to the main question, it is well to bear in mind that photography, in its more practical form, is comparatively a new invention. It is only in recent years that its results have been largely felt, but what has been already accomplished will show us how important a part this invention is likely to play in the future education of mankind. The most noteworthy movement of the last hundred years has been that towards equalising the condition of men, towards enabling all men, as

far as practicable, to have an equal chance in the battle of life, by the removal of privilege, by equality before the law, and still more by bringing knowledge within the reach of all; for, as Professor Stuart lately reminded us, the *Great Leveler is Education*. Now, gentlemen, what are the chief avenues of knowledge? Are they not four? Personal experience, conversation, books, and the pictorial arts; the last three being the means by which we are enabled to benefit by the accumulated experience of those who have preceded us, and the constantly growing experience of our contemporaries.

It is in connection with what I may call pictorial education that photography plays, and will increasingly play, an important part. We are taught by pictures before we are taught by books, and pictures appeal more simply and more directly to the mind than do books. We all recognise this in the education of children, but we do not perhaps sufficiently appreciate how much we all learn, almost unconsciously, from pictures, and all the more readily that the primary object of most pictures is not so much to teach as to please.

We are already so far accustomed to the results of photography as not to realise at first sight how much we owe to it or how badly we should fare without it. Look at our book illustrations, and illustrated papers, and magazines. You will frequently find, even when the engraving is not acknowledged to be "from a photograph," that a photograph, nevertheless, has been the basis upon which the engraver has worked. Indeed, photography may be said to have rendered possible a large class of illustrated books and papers. Just as the invention of printing has enabled us to appropriate readily the knowledge of others, so the invention of photography has enabled us to see through other eyes than our own. To the modern traveller the camera is a sort of third eye, upon the retina of which he is able to receive permanent impressions which he can store for our use as much as his own. Before the days of photography it was rare for the traveller to be able to give a pictorial representation of the scenes which he witnessed, because, with the spirit of adventure which carried him on his difficult way, there was not often allied the skill to produce an interesting and useful sketch; or, possessing the skill, he had not the necessary time and opportunity. Thanks to the camera, however, we now all have within our reach an infinite number of pictures, giving us the most varied and valuable information as to the countries and people of the world; pictures possessing the scientific value of accuracy with a marvellous extent and delicacy of detail. For instance, at the recent Colonial Exhibition few objects were at once so interesting or so useful as the large and, for the most part, admirable collection of photographs in each department, which enabled us, by their faithful record, to realise in regard to each of our distant colonies the outward aspect of nature, the scenery of their mountains, and lakes, and rivers, and forests; the appearance of their towns, the aspect of their streets and monuments, the architecture of their public buildings, the degree of refinement or comfort of houses and furniture, the costumes and features of their people, with their modes of conveyance, their occupations, and amusements; their engineering work and art manufactures; the varieties of domestic and wild animals, or the luxuriance of the vegetation in the midst of which they dwell. And especially remarkable is the service of photography in architectural representation; for, in a moment, and at trifling cost, can be produced an architectural picture wonderful in its exactitude and infinite detail, reproducing not only what the traveller has seen, but much more than he could possibly have noticed, in, for instance, the wondrously complex beauty of a Cologne Cathedral or the profuse ornamentation of an Indian temple. So familiar, indeed, has photography made us with the great monuments of the world that the intelligent lingerer at home often knows more about them than the average traveller, and he is sometimes led to doubt whether he has not actually visited scenes which he knows so well. So there are many arm-chair travellers and fireside explorers, and, thanks to photography, the "untravelling traveller" may share in the breadth of view and the cosmopolitan knowledge of those who have the privilege of visiting other climes and distant peoples. Nor can we doubt that the multiplication of examples and details of the architectural beauties of strange lands has contributed to the widespread improvement of the public taste and aroused a new interest in the history of the people whose works of genius have won our admiration or wonder.

But the perfect fidelity of photographic representation could not fail to be useful in other directions, and, accordingly, we find it extensively used in commerce, where it provides remarkable facilities in prosecuting certain branches of trade. The next best thing to seeing a machine or a piece of furniture which we wish to buy is to see its photograph, on the truth of which we know we can rely. You are doubtless familiar with the value of photography in the large variety of trades connected with art manufactures and in the various branches of civil and mechanical engineering. In great works, such as the construction of ships and bridges, it not only furnishes us with accurate pictures of the completed structure, but enables permanent and correct records to be kept of various stages of progress, or exhibits temporary or accidental conditions, the knowledge of which is of great interest to the engineer. The applications of this art to commerce are rapidly extending, and one hears of it in unexpected directions, as, for instance, in the provision trade, where I find that certain American houses send out photographs from actual samples to show the different cuts in which they are prepared to supply bacon.

Passing on to deal very briefly with the application of photography to science, I may remind you that the camera has only to a very limited extent been as yet useful as an instrument of scientific research, although I believe it is destined in the future to do valuable service even in this direction. It differs in that respect from the microscope and the telescope, by whose discoveries "creation widens in man's view." We look out upon the vista of the infinitely great and the infinitely little, and realise that the work of the Creator is as admirable in the one direction as the other. The camera is less a discoverer than a spreader of knowledge; and just as it lets us see through the eyes of the wanderer in distant lands, so it enables us to look through those of the biologist at his microscopic studies or those of the astronomer as in the solitude of his observatory he gazes into the starry night. You all know how extensively photographs taken through the microscope are used in the illustration of scientific handbooks, and how by enlargement through the lantern on a screen they prove a useful factor in scientific and popular education. On the other hand, telescopic photographs are now common in connection with pictures of the moon's surface and transit or eclipse observations, and they have proved useful in determining doubtful points in relation to solar physics, while accurate and highly detailed star maps have been produced on photographic plates so sensitive as to record the existence of distant stars and nebulae the faint light from which fails to make any impression on the human eye.

Among the most interesting and promising scientific applications of photography may be mentioned Mr. Galton's researches into averages of physiognomy, and I should like to call the attention of members to some very curious and interesting composite portraits produced on the lines of Mr. Galton's suggestions, but on a new system, by Mr. John T. Stoddard, of which examples will be found in the *Maro's number of the Century*. You will find there a true family portrait, a composite photograph which embodies in one typical face those of a father, mother, five sons, and one daughter. Mr. Stoddard also gives three composite portraits, the result and types of three school classes of young ladies, and, finally, what he calls a co-composite, in which those three composite portraits are merged into one, representing sixty-nine persons. These singular and even beautiful results are obtained by the successive exposure upon one photographic plate of a number of subjects, all of one size and in one position, full-face, three-quarters, or profile. All the faces are focussed so that the eyes and mouth correspond exactly to two horizontal lines and the nose to a vertical line upon a focussing glass, with the result that all the faces are, so far as their leading features are concerned, exactly superposed. The aggregate of the exposures equals the exposure which would be required under the same conditions of light to produce a full impression of any one subject, so that if the composite portrait is taken from twenty subjects the exposure of each subject is very short, equal to one-

twentieth only of the normal exposure. The pictures so produced are not blurred, as one might at first suppose, although they have a peculiar character of their own and a certain haziness of outline which adds rather than detracts from their beauty.

Turning to medicine and surgery, we find that they, too, are under obligations to the camera. Photography is much used in psychological medicine in depicting the physiognomy in different forms of insanity. It is employed by publishers in the delineation of diseased or injured conditions, while the lecturer on pathology is able by photo-microscopic slides enlarged upon a screen to demonstrate to a class of students the points of difference between sections from healthy and from diseased structures. Now, gentlemen, let us step across from the medical school to the police office. Here, too, the camera has become indispensable, and photographic albums are always at hand which have a very special interest for the detective police, since photography has become one of the safeguards of society against crime.

Where there is so much of accomplished fact to dwell upon it is rash, within the limits of a short address, to venture to refer to future possibilities; but is it not quite conceivable that instantaneous photography, which has made so much progress of late years, may yet prove a powerful weapon in the service of the police, and open a new chapter in the history of criminal evidence? If you look at instantaneous photographs of street scenes, or processions, or crowds, you will not fail to be struck by some unexpected features or to notice the evidential value which these pictures afford of the relative positions, the attitudes, the obvious intentions, of the many persons which they represent. In an instantaneous view which I took of an artillery detachment at work one luckless individual is for ever convicted of having at the moment been occupied in surreptitiously blowing his nose; while in another, of waves breaking on a rocky shore, I afterwards discovered an interesting couple, whom at the time I had not noticed, sitting very close to each other on a ledge far above, confident in their own happiness and the supposed absence of observation.

In Germany recently I was shown a new form of detective camera, rotary in action, and very flat in shape, for convenient suspension by a ribbon from the neck, so as to be concealed quite conveniently under the coat, with the small lens projecting through a button-hole. The apparatus once charged is capable of producing six instantaneous views in rapid succession by the simple pulling of a string. Whether this instrument will be so far perfected as to lead to our police being armed with photographic revolvers remains to be seen.

Among the best results in instantaneous photography with which I am acquainted are those which have been attained by a German photographer, Mr. Ottomar Anschütz, who has devoted himself to this branch of work, and whose pictures are of singular interest and merit. His enlarged views of the laying of the foundation stone of the new German Parliament House, and of the inauguration of the Niederwald Monument by the Emperor of Germany, are suggestive of the historical interest which must needs attach to work of this kind; and his collection of instantaneous photographs from recent autumn manoeuvres, taken by direction of the War Department, have aroused much interest in Germany. He has published a large variety of admirable examples of moving animals, and particularly of flying birds; but his most original and valuable contributions have been the serial photographs by which he has illustrated the analysis of muscular action, as, for instance, in the movements of a naked man taking a long jump, or throwing a stone, or of horses galloping, or leaping over obstacles. Others before him had obtained results very suggestive and interesting, illustrating the motion of animals, but they were characterised by an almost complete absence of detail, and were in fact little more than outlines or silhouettes. Those of Anschütz, on the other hand, notwithstanding excessively rapid exposures, are not only sharp but full of detail, and they have the scientific advantage of showing a consecutive series of views, following in succession at equal and very short intervals of time, so as, for example, to give a complete analysis of the movements of a horse in leaping over a hurdle, or of those of a bird in one flap of its wings during the act of flying. The difficulties to be encountered will be to some extent realised when you consider that the time required for the complete movements just referred to are about three-fourths of a second for that of the horse, and one-eighth of a second for that of the bird, and that the series of combined cameras must be capable of giving up to twenty-four successive pictures per second, at equal intervals of time. The series of ten views of a leaping horse, which I submit for your inspection to-night, have been taken with exposure of one-one-thousandth of a second, at equal intervals of time of one-sixteenth of a second. It is characteristic of the readiness with which the German Government encourages all educational works that it has assisted the photographer to the extent of over £1000 in the production of his complex and ingenious apparatus, and has instructed him to prepare for the military riding schools series exhibiting the analysis of the movements of horses at their various paces.

Gentlemen, I am anxious not to weary you with the general and, I fear, very imperfect review which I have undertaken to bring to your notice in this address, and therefore I will now only add a few words on a subject worthy of a more detailed consideration—the position of photography in relation to the arts. Let us consider it under the two aspects. First, as regards the original production of photography, and, second, in reference to photographic reproduction of fine art works.

We cannot claim for original photography that it can express the higher forms of art, for its very nature bids it too closely to objective as distinct from subjective expression. To many of the applications which we have hitherto considered, this characteristic was precisely what gave a value to photographic pictures. Then, the intention was to obtain accurate and reliable representations, as free as possible from the subjective modifications or exaggerations which the imagination or prejudice of the observer might import into his picture. When, however (as in fine art work), the intention is to give pleasure by picturing the beautiful, the pure objectivity or realism of the photograph places it at a disadvantage. Original photography can show us indeed what the eye of the artist sees in nature, but it cannot express his lofty ideal; it cannot become a vehicle for the play of his fancy, or the inspiration of his genius; it belongs strictly to the realistic school. Nevertheless, the artistic photographer is able, by selecting for delineation such scenes or objects or conditions as harmonise with his own ideals, and by applying his knowledge of combination printing, to produce works of great beauty, which, in a certain reflex sense, bear the stamp of his own mind.

Any one who has compared views which different persons have brought from given districts, or even views by different persons of the same object, must become conscious of the difference between the mere photographer and the photographic artist. Therefore it is, that although original photography cannot express the highest forms of art, we owe to it a multitude of most beautiful pictures, which, quite beyond their value as mere realistic representations, and sometimes even in spite of it, possess for us a true artistic interest. We must note further that photography, like the arts of engraving and etching, is limited for its expression to monochrome; nor does the present condition of our knowledge warrant any prospect of our being able to pin the glory of colour, which we are able to bring as far as, but no further, than the focussing glass of our cameras.

But, notwithstanding these disadvantages, notwithstanding its bondage to realism and its inability to render the charm and variety of colour, photography has enriched us with a new source of delight in an endless diversity of pictures, where we may look now on the awful grandeur of the Alpine peaks clad in their mantle of eternal snow, or on the mountains mirrored in the placid waters of the lake, and now on the mighty plunge of the cataract, on the broad ship-laden river, or the babbling stream, that

"Gurgling kissed his pebbled shore."

Beautiful as are the views over land and sea and sky, the studies of trees and animals, which 'the camera has' given us, its greatest service has been in the direction of portraiture.

The great portrait painters are few, and even these are singularly unequal, and

therefore before the days of the camera good portraits were rare indeed. For one grand work by a Velasquez, a Rembrandt, a Vandyke, a Reynolds, or a Gainsborough, we have thousands of mere dubs, whose wooden expression bears a more or less clumsy resemblance to their originals. Of the outward aspect of some of the most interesting figures of even modern history we can form but a vague idea. Our forefathers cultivated, indeed with some success, the art of miniature painting, and immediately before the advent of Daguerreotype there were skilful artists in black silhouettes, which still enable us to see dimly the profiles at least of our great-grandfathers and great-grandmothers. But the brilliant inventions of Niepce and Daguerre, and their successors, have enabled us to take, as it were, a short cut to the reproductions of the human face, which is at once the most interesting object in nature and at the same time the most subtle and difficult to portray in any other way.

Of course there are bad photographic portraits. Most portraits of any kind are bad! But where great technical skill has been allied to true artistic feeling, photography has endowed the modern world with superb portraits, in which happily we see ourselves in the early days of simplicity and innocence, or recall with deep interest the features of those whom we have loved and lost, or in which we may draw near in a sort of intimate personal knowledge to all that the world knows of greatness, of goodness, of beauty, or of intellect.

We are warranted therefore in ascribing to photography, in regard to its original productions, an honourable place among the fine arts, and we may now proceed to consider very briefly the great educational service which photography is rendering in connection with the humble but most useful sphere of fine art reproductions. In this direction there has been a wonderful development in recent years, a development due in part to improvements in silver printing, and to the beauty and permanence of the results obtained by the carbon, platinotype, and other processes, and in part to the discovery of methods by which photography may be translated, so to speak, into printing in pigments or permanent inks, while recently photo-engraving has opened a wide field of valuable possibilities.

I have already referred to the service of photography in architectural representations. Sculpture, too, which, like architecture, relies for its effect upon beauty of form rather than charm of colour, is specially suited for the monochromatic rendering to which photography is limited. But among fine art reproductions it is in connection with copies of paintings and drawings that photography has met with its widest application.

Photographic copies of noteworthy modern pictures are available in Germany and France to a greater extent than in this country. By arrangement with the painters or the owners of pictures, photographs are published of all the more important works of the annual and permanent exhibitions, and thus the modern artist appeals to a widely extended public, and thousands are able to gather something of the charm or the lesson of a great work of art which they may never have the opportunity of seeing.

Not all pictures are capable of successful photographic representation; but the improvement of processes has given us admirable copies of a large range of works of art, including the masterpieces of the old and modern schools, and in such size as to be available for exhibition in public art galleries, where a selection of the productions of Messrs. Braun, of Dornach, or the Autotype Company, or the Berlin Photographic Company, or the Messrs. Goupil, and others, cannot fail to be of great value in the promotion of art culture. Copies of most of the best works in our own National Gallery, and in the great Continental collections, can now be had in excellent execution and at small cost; and these reproductions deserve to be more largely used than they are as prizes in schools, or for home decoration, when they are far preferable to inferior paintings of greatly larger cost. In these productions we have not, as in engraving or etching, the painter's work translated by another mind and hand, but copies of wonderful fidelity, in which the original may be said to have copied itself, and in which all that is characteristic is reproduced. For copies of works in monochrome, such as chalks or sepias, they may be printed in the exact colours of the original, reproducing the very texture of the paper, and with such perfection as to be only distinguishable from originals by the careful examination of experts.

Photo-engraving has, I believe, a great future before it, and dealing as it does with modern pictures, has the advantage of the co-operation of the artists themselves in the publication of their works. This beautiful art will, I think, to a great extent, supersede the old method of engraving and etching, although these will still be required to complete and give vigour to the photo-engraved plates. The variety of colour in which impressions may be taken by photo-lithography and photo-engraving, removes the reproach of monotony which has hitherto attached to collections of photographs, and any one who has seen the recent coloured productions of Messrs. Goupil & Co., of Paris, will have realised that a new charm has been added to photographic printing, and that new prospects of progress and usefulness are being developed. Indeed, when we remember that it is little more than forty years since Daguerreotype and Tsbotype first became known, we cannot but wonder at the development and at the varied application of photography.

To the complete organization of the modern world, any new invention or discovery, any practical advance of knowledge, becomes rapidly absorbed into the universal system. On the other hand, it is remarkable how we seem sometimes to linger a long while on the thresholds of great discoveries. Some curious fact is recorded by the scientific observer, but lies dormant and unfruitful of useful consequences until possibly long after a comparatively small advance permits of practical application and unexpected developments.

We may look with respect, therefore, on abstract scientific research, although particular features of it may not at the moment appear to belong to what we consider useful knowledge.

Before the beginning of this century the action of light upon salts of silver had been observed, and the curious but evanescent and pictures which Davy and Wedgwood had obtained, remained among the unappreciated curiosities of science. Two generations passed away before the processes of Daguerre and Talbot, together with the discovery of hyposulphite of soda, and its action in dissolving silver salts, showed how sun pictures could be fixed and photography become practical. Even then the first steps were slow. Daguerre mentions that although landscapes required an exposure of seven to eight hours, he believed that single monuments, when strongly lighted by the sun, might be taken with an exposure of three hours only. The early portraits required an exposure of from three to ten minutes, while now negatives may be developed which have been exposed only one-one-thousandth part of a second! In our hasty survey we have seen how, once fairly launched, photography has grown to be a most valuable agent in the hands of man, how it has rendered vast services in the spread of knowledge, how it has assisted distant people to understand or know each other, how it has proved a great educational factor, given facilities to commerce, become a help to science, and a handmaid of art; how, too, it has provided us with one of those new sources of pleasure and interest, which go to compensate us for the life of keen competition and restless activity in the midst of which we moderns are called upon to work.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE last meeting of the session of the above Society was held on Friday last, the 13th instant, in the Royal College of Science, Dublin.—Mr. J. V. Robinson in the chair.

MR. LOUIS MELDON exhibited and explained a new form of washing trough for prints or plates as used in the Observatory at Stonyhurst. The trough was divided into two compartments and rocked on a horizontal axis, so that the supply tap was either over one or other of them. When one compartment was

full, the apparatus was so balanced that it tipped over, allowing the compartment just filled to empty, and placing the other one under the tap to be filled; and when the latter became full the same thing occurred, so that the compartments went on filling and emptying alternately.

A sum of money was voted by the Society for the expenses of the Triennial Photographic Exhibition which is to be held in the rooms of the Royal Hibernian Academy during the month of November next, and which, from the great interest taken in photography, and the increased number of workers during the last three years, should surpass its predecessor both in the number and quality of its exhibits.

Correspondence.

Correspondents should never write on both sides of the paper.

THE RIGHT TO THE NEGATIVE.

To the EDITORS.

GENTLEMEN,—Does a sitter sit for a negative and twelve *cartes-de-visite*, or twelve *cartes* alone? If he stipulates for the negative, then he must in law hold receipt for one negative and twelve *cartes-de-visite*.

If a party requires from me a negative of himself I charge, one negative, 1s.; one *carte*, 1s. A negative is not a portrait to deliver to a customer, and it must be stipulated if a purchase is arranged that the negative is of certain value. None but an idiot would demand the negative when not stipulated for. If I order my house painted at £4 15s., and then say I require paint-brushes, pieces of pumice stone, and all tools left after the job is done, I must, forsooth, be charged: To painting house, £4 15s.; to brushes, &c., used for doing the same, 5s. 6d.; total, £5 0s. 6d.

Now let us for one moment presume I order from Messrs. Marion 5000 *cartes-de-visite*, £2 10s. The receipt is for 5000. Can I demand the engraved plate? Certainly not, the agreement being for 5000 *cartes* at £2 10s. But Messrs. Marion hold the plate. Why do they do that? For the simple reason they would be pleased to supply more cards. But providing they invoice 5000 *cartes*, £2 10s.; the engraved plate, 10s.; total £3; then it is obvious I have paid for cards and the plate, and I can demand the same.

If a sitter be entitled to the negative, he is also equally entitled to your camera and lens, the latter being quite as essential to take the picture as the negative is in the hands of the printer. And, moreover, to make the whole thing more unmistakably clear, as I pay you three-pence per week for your valued JOURNAL, and the press you used being essential to your turning the paper out to me at that price, may I not respectfully ask you to send me on the press you use per luggage to Edge Hill?—I am, yours, &c.,

BLASE.

Liverpool.

N.B.—By-the-by, this reminds me of a well calling here one day and asking in swelish terms whether I could take a negative of him. I replied, "Oh, certainly;" took him at his word, gave him a receipt—"Mr. Anderson, to one negative, 1s. Paid." When he called I duly handed him his negative. He looked at it all ways, and asked what the deuce was that, he was no nigger. Did I call that a portrait? I said, "Certainly not. You sat only for a negative and paid for the same. I did it, and here it is." After a little tall swearing I informed him that when parties sat for a negative they were handed what they had paid for, but if they sat for a *carte*, or *cartes*, it was specified on the receipt. Photographers do not give receipts for negatives and *cartes*. B.

To the EDITORS.

GENTLEMEN,—"J. F." need not be surprised at the silence of photographers on the subject he writes upon.

Photographers should know how to conduct their business best. The public go to them on their own terms; if those terms do not suit, they are at liberty to stay away. During more than twenty-five years' practice as a photographer I have never once had the negative demanded of me as a right. I have been requested to sell it, but often have I been desired to take great care of it. "J. F." does not seem to know that repeat orders form a large part of a photographer's income, and very often a negative *years old* yields an order for enlargement of from £5 to £20. That occurs frequently. "J. F.'s" suggestion to destroy the film would not do at all. A really good photograph is rarely secured a second time, and for that reason alone it should be preserved. Photographers know all about this, and go to great expense in fitting up rooms on purpose for the care of negatives, which means a good sum of money *yearly in rent*, some of our large firms requiring a building for this purpose alone. I give these few particulars, of which "J. F." seems to be quite ignorant or quietly ignore. I do not use argument, it is not necessary. I repeat, we do not charge for negatives, not even for the films (which is *not his*), and I think we shall still be allowed to conduct our business in our own way. We have nothing to do with either engraver's plates, lithographer's stones, or type pic.—I am, yours, &c.,
1, Orchard-street, Sheffield, May 9, 1887. FREDERICK BASEE.

To the EDITORS.

GENTLEMEN,—Permit me to express my opinion with regard to "The Right to the Negative." First, then, my opinion is that the negative

belongs by right of custom to the photographer. In proof of this statement it will be found that when any dispute arises in business matters in regard to *unwritten laws*, if taken into court, judgment will be given in accordance with the custom in vogue in that particular business.

I am not aware of any law entitling the "sitter" to the negative, and it is quite notorious that the custom among photographers has been, and is, to claim the negative.

Although an extra charge is made for taking the negative, I fail to see how it should become the property of the "sitter," who only pays for the skill, labour, plate, chemicals, camera, lens, studio, &c. Query: Should the whole concern belong to any one who pays for the production of a photograph? Hardly!

Also some of your correspondents advise the destruction of the negative. But who is to be the destroyer? The ownership must be decided first.—I am, yours, &c., N. S. B.

Kirkcaldy, May 16, 1887.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITORS.

GENTLEMEN,—May I trespass upon your kindness to insert this notice. The Committee are desirous of extending the knowledge of the existence and objects of the Association, and to further that aim have issued the enclosed handbill. I shall be pleased to forward a supply to any photographer, photographic dealer, or others willing to assist in the circulation of the same, who will, by this action, render material assistance in obtaining the requisite publicity.

With the subscription only 2s. 6d. per annum, every assistant should become a member of the Association.—I am, yours, &c.,

Offices: 181, Aldersgate-street, E.C., May 16, 1887. H. HARLAND.

THEATRICAL PHOTOGRAPHS.

To the EDITORS.

GENTLEMEN,—I confess I am somewhat surprised that Mr. J. F. Roberts took the trouble in last week's JOURNAL to say that I followed *his* example in taking theatrical photographs; but having done so, I am quite sure he will gratify me by taking a very little more trouble and answering the following plain questions:—

1. Who proposed and proved to him that such photographs could easily be taken with orthochromatic plates, and persuaded him to see Wyndham on the subject? 2. Who went with him and took negatives of the stage, without figures, in order that future exposures should be correct? 3. Who gave him the formulæ for orthochromatising his plates, and explained how it was done? 4. Who was it that, after all arrangements had been made for the joint photographing of *David Garrick*, wrote a letter, received on the morning of the day of performance, saying that Mr. Hyslop could not be admitted, as it was merely a private matter, and Mr. Wyndham objected to being photographed by any one but Mr. Roberts?

There is just one point more in Mr. Roberts's correction I would like to notice, and that is his grievance against the Camera Club because some one did not call attention to his pictures. I am not aware whether any mention was made or was not made of the pictures, but I think that Mr. Roberts might (at least in the first instance) have brought his grievance before the Club, through the proper channels, before airing his wrongs in a public print.—I am, yours, &c.,

WM. H. HYSLOP.

Camera Club, May 17, 1887.

Exchange Column.

- Will exchange a Victoria camera and four lenses for interior backgrounds.—Address, G. SPRINGTHORPE, 18, Tacket-street, Ipswich.
- Will exchange a Lerehour's single lens, fourteen-inch focus, for a whole-plate zinc negative washing trough.—Address, R. DAVIES, 5, Sunningfields-crescent, Hendon.
- A nearly new copying press, size about 12x10, in exchange for a Marion's large developing lamp.—Address, A. WOODWARD, 12, Alfred-street, Blackpool, Lancashire.
- I will exchange a fifty-two-inch Coventry tricycle, suitable for carrying photographic apparatus, for Ross' Universal or symmetrical whole-plate lens, or good accessories.—Address, W. PLAYLE, Bishop's Stortford.
- I will exchange the following for 12x10 studio camera with two slides:—Quarter-plate Lancaster pocket camera, one double slide and lens, 5x4 Ross' view ditto, five Victoria portrait lenses fitted to plate, and cabinet furnisher.—Address, MYLES GARNER, 296, Holloway-road, N.

Answers to Correspondents.

- PHOTOGRAPHS REGISTERED:—
J. H. Mann, Sandall, near Doncaster.—Interior views of Bolton Castle.
John Owen, Newtown, North Wales.—Portraits of the late Mr. Ceiriog Hughes.
- E. BONSFIELD.—Received. In our next.
- F. W. B.—It is a printer's error. It should be *ferrous sulphate*, not ferric sulphate.
- R. C. STOKES.—The surface of the silver vase may be dulled by the well-known expedient of placing a piece of ice in it. So it also may be dabbing it over with a piece of glazier's putty.

C. C. C.—The pictures in question are by the collotype process. They are about the best examples of collotype we have seen for a long time. They are returned by post, as desired.

O. X.—You have continued the heat too long. As soon as the solution becomes concentrated set it aside to cool; crystals will then form. The silver had better be crystallised before use.

E. J. W. will feel obliged if Mr. E. H. Jaques, who read a paper before the Birmingham Photographic Society, will read the formula given on page 254 and say if the proportions there given are correct.

CAIRO.—Print the pictures on albumenised paper and tone to a cold colour then dye them a pale greenish blue with Judson's dyes very much diluted. The numbers may be written with a pen charged with liquid Chinese white.

A. W. MIDDLETON.—The chief faults in all the negatives sent is under exposure. Some of the plates require quite three times what they received. With this information we advise you to try the subjects once more. Good pictures of similar subjects are being constantly taken.

SAML. WILLS wishes to know how he can blacken a camera stand which he has constructed of pine. The wood can be blackened by painting it with a mixture of brown-hard varnish diluted with about an equal part of methylated spirit, to which some lampblack has been added.

H. R. W. writes: "I have an old but good quarter-plate portrait combination lens; would you kindly tell me if it requires any alteration to make it suitable for enlarging, and if so, what?"—The lens require no alteration, and if it be a good one will answer quite well. Of course the posterior glass must be placed next the negative to be enlarged.

TYRO says: "I have seen that in your JOURNAL you recommend shellac varnish for wooden washing trays. I wish to make a large tray, 16x14x8, and wish to preserve the wood and make watertight, so as to wash prints in it. Will you kindly inform me if shellac varnish is best for above, and how to make the varnish?"—Shellac will do quite well, but the first coating should be with a dilute solution, so as to allow of its being absorbed by the wood. The after coatings may be thicker. The shellac solution is made by dissolving the lac in methylated spirit. Brunswick black also makes a good waterproof coating for wooden vessels, and is preferred by many to shellac.

GREENHORNE writes: "How is it, that when I focus my single lens with a large stop (say three-quarters of an inch) I can fill a 7x7½ focussing screen with the view, but after putting in the quarter of an inch stop to make it sharp, I can't fill a 6½x4½ plate to the edge, but get a circular picture. I am taking a rather dark interior, and I can't get a sharp picture unless I put in the quarter of an inch stop, but that reduces the picture. How can I alter this, as I want to take the whole of the interior? My lenses are only about six-inch focus, and the church is about ninety to one hundred feet long."—Our correspondent's trouble arises from the stop being placed too far from the lens. If the stop be placed nearer none of the view will be cut off.

S. TALLOW asks: "Would you kindly inform me in your JOURNAL what is the cause of my silver bath becoming crowded with crystals like short hairs, rendering filtration necessary nearly every day. I have looked up Abney's work on the subject, and the only thing I see like the defect is over iodising, which he says causes these crystals or granules; but I have made up a new bath and put no iodide in it, and the same thing occurs after a week's use."—The needle-like crystals are caused by the bath becoming supersaturated with iodide of silver. All baths are liable to this, even after continual use. The remedy is to add an equal quantity of water to the bath, which will precipitate most of the iodide, filter, and then make up to the original strength with nitrate of silver. Very little reliable information has been published on the production of blocks in half tones.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—There will be an excursion on Saturday, May 21, to Waltham. The train leaves Liverpool-street (Great Eastern Railway) at forty-three minutes past two p.m.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, May 25, 1887, will be on *Photographing Interiors*. Saturday outing at Winchmore Hill. Meeting at Railway Station as near two o'clock as possible.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting of this Society will take place on Tuesday next, May 24, at eight p.m., at the Gallery, 5A, Pall Mall East, when a demonstration will be given of *Platotype Printing*.

EFFECT OF TOBACCO ON THE SIGHT.—On the occasion of a lecture on leuses and cegnate topics by Mr. Trail Taylor at the Balloon Society, Royal Aquarium, on Friday last week, it was stated that astigmatism, or the inability to see vertical and horizontal lines with equal distinctness, could be temporarily induced by tobacco, the eye resuming its normal functions in about an hour after the pipe was laid aside. Dr. Lindsay Johnsen afterwards corroborated the statement as to the effect of tobacco on the sight by giving an instance of colour blindness having been produced by its agency. In course of his lecture Mr. Taylor gave some statistics relative to the enormous heating power of the sun's rays when concentrated by lenses or reflected by mirrors. By the former, such refractory metals as platinum could be melted in a few seconds; while, by the latter, it would not be difficult to ignite any wooden structure at a distance of half a mile or more.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1412. VOL. XXXIV.—MAY 27, 1887.

VIGNETTING FACILITIES.

NUMEROUS are the devices which have been created in the brain of the ingenious photographer in order to adapt his vignetting mask to the negative while in the printing frame, and not a few patents have been obtained for mechanical appliances to facilitate this end. Of these, some have been so elaborate as to render their possession a matter involving an expenditure which might in some slight measure hamper the financial resources of the young photographic aspirant. Without detracting from the special merits of the various vignetting arrangements which have existed or do exist at present, we are in a position to describe one which possesses merits peculiarly its own, being simple, cheap, and very readily adapted to the negative. It owes its existence to Mr. Lyonel Clark, C.E.

Every one is aware of the system of vignetting by placing in front of the negative a piece of cardboard having in it a suitable aperture. Mr. Clark's improvement upon this is one which very little reflection will show to be of great importance. It consists in substituting for the cardboard a sheet of thin lead; that which Mr. Clark left with us is what is known as "four-ounce" lead, and is therefore exceedingly thin and, consequently, cheap. It is manufactured mainly for the purpose of lining damp walls upon which paper is intended afterwards to be hung.

Having obtained a piece of this lead somewhat larger than the printing frame (this is important), cut out the oval or other desired form of opening, a pair of light scissors sufficing for this purpose, for it cuts quite as easily as the thinnest paper, if not somewhat easier. Laying this opening down upon the figure in the negative that is to be vignettted, and having adjusted it carefully, the margins of the sheet lead are then bent over the edges of the printing frame, by which the mask is permanently retained in position. Owing to the extreme pliancy of the lead it may be lifted up from the negative to any desired extent, so as to give the maximum of softness to the margins of the portrait, or, if desired, it may be raised irregularly, so as to produce any effect as regards softness of outline demanded by artistic requirements.

Unlike a paper or card mask, this is unaffected by rain or the weather, and when done with the margins are raised and the sheet of lead is ready to be fitted on any other portrait. For large portraits it may be desirable to employ a somewhat thicker sheet than that mentioned.

It is evident that by preparing and keeping in stock a few sheets of the class here described, with apertures of different forms or dimensions, the photographer will possess a vignetting armoury which will serve him in good stead and be always ready for use under all circumstances.

Small although this invention may at first sight seem to be, yet is it one which is capable of greatly facilitating the production of vignettes.

PHOTOCHLORIDE OF SILVER.

WERE it asked, Who of all those connected with photographic science has, by original research, careful experiment, and lucid description, done most to advance our art in what we may term its practical science? it is probable that the answer would be M. Carey Lea, of Philadelphia. Those who have access to our volume for 1875, and who will turn to the issue for May 28, will find there such a record, albeit an imperfect one, of the contributions of this eminent *savant* and *confrère* to chemistry, photo-chemistry, and practical photography, as will prove almost astounding, and yet at that period his work was still going on. Compelled by a tedious course of ill-health to discontinue his regular communications to THE BRITISH JOURNAL OF PHOTOGRAPHY, of which he was for many years the honoured American correspondent, he has of late been engaged in an investigation in the subchloride and "photochloride" of silver, in a large measure, in connection with heliochromy.

Although for the last two or three years the photographic world has heard but little of Carey Lea, yet when we study the paper which appears in our columns containing the result, or rather a part of the result, of his work during this time, we shall see that it was such as to call for his undivided attention. Mr. Lea believes that he has been able to prepare by chemical means the material forming the famous "latent" image; and he has confirmed his results by a great number of experiments. It appears to consist of a sort of molecular combination between chloride of silver (Ag Cl) and subchloride of silver ($\text{Ag}_2 \text{Cl}$)—the amount of the latter substance varying from an extremely small proportion up to eight or nine per cent.

It is difficult, or impossible, to explain according to chemical theories the nature of this combination between the chloride and the subchloride, but it is evidently of a remarkable and surprisingly stable nature, for reagents, such as strong nitric acid, which would attack either of these bodies separately, has no effect upon them when in combination. For this compound or double chloride Mr. Lea proposes the name of the "photochloride," a term which is not, we fear, in accordance with the rules of chemical nomenclature, but which has the advantage of avoiding any theory as to the exact composition of the substance.

By forming or spreading this "photochloride" upon the surface of paper, &c., Mr. Lea has been able to obtain coloured copies of the spectrum, and of paintings on glass, &c.; and we

agree with him that this photochloride which he has been the first to identify, to isolate, and to prepare in quantity, is the same as that with which Becquerel, Poitevin, and others obtained the promising results in heliochromy recently described by Jerome Harrison in our pages.

In a continuation of his paper next month Mr. Lea promises to deal with the manner in which the latent image is produced by the action of light.

We hail with delight Mr. Lea's reappearance in this connection.

PHOTOGRAPHING FLOWERS.

BEFORE leaving the subject of lighting, it may be well to point out that a very great deal may be done to improve the effect by arranging the position of the object with regard to the window or source of light so as to best suit the character of the subject. Thus, if a spray or branch have a natural inclination in a certain direction, the heavier shadow will be cast on that side to which it leans, and it will be proper to so adjust the light that that side be not thrown into too great darkness. Or, again, if the subject be furnished with bushy foliage, with prominently projecting branches or sprays, the hollows or depressions will, if lighted wholly from the side, be rendered as black, unsightly patches, whatever length of exposure may be given. In such cases the best course to adopt is to light more or less from the front by bringing the camera nearer to the window and removing the object further away, but more in the direction of a right line from the centre of the light. In this manner, and in many other cases, much trouble and disappointment is saved, for when the lighting is not managed to advantage the difficulties always present in exposure and development are greatly enhanced.

Turning to exposure, the one golden rule must be to expose long enough. Let the mind be completely freed from all ideas of quick exposures and forced development, for such a course is absolutely and utterly impossible. The natural characteristics of the class of subjects are alone sufficient to contra-indicate short exposures even under the most favourable circumstances, for whatever may be the colour of the blossom, the green of the leaves, no matter what its tint, must have its due share of light. If the blossom be white or any delicate light colour, photographically speaking, instead of the exposure being shortened the very reverse is the case, for the very contrast between the flowers and foliage necessitates a "full" exposure in order to counteract any tendency to harshness. Yellow and red flowers, especially if dark in tint, suffer proportionately less by curtailment of the time of exposure; but though the result, pictorially, may be better than in the case of the lighter tints, the correctness of the colour rendering must inevitably suffer. Besides this, the conditions of lighting under which we recommend the work to be done are such as require a liberal allowance of time in exposure in order to produce artistic effects without harshness or heaviness.

But the question will be asked, "What constitutes a full exposure?" to which we can only reply that everything depends upon circumstances. The plate, the subject, the light, the studio, in fact, every single item in the process demands its share of recognition as affecting the all-important exposure. But a very few experiments in a new studio will give a good idea of what is requisite under normal circumstances, and any variations in plates, or light, or subject, can then be easily calculated and allowed for. As a rough idea, we may mention

that at a distance of three or four feet from a window about four feet by three feet in dimensions, and facing south, but without the sun on it, we are in the habit of giving from three to fifteen minutes, according to the subject, the lens being stopped down to about $\frac{f}{36}$. These lengthy exposures are made to suit a special development, as will be explained later, for under the same conditions of lighting and employing a normal developer, ten seconds with most subjects will suffice to produce what would be a good negative if it were a reproduction of any other object. But in order to obtain the detail in the abnormally deep shadows that is requisite to an artistic rendering of the subject, it is absolutely necessary to expose solely for those shadows, leaving the better lighted portions to be dealt with by a modified development.

Even these exposures are not abnormally long for the class of work, for we know that one master in the art of flower photography, to whom we referred in our previous article, used to be in the habit of giving as long as half or three-quarters of an hour, and that under a glass roof, though it is true the lens employed was a slow one, stopped down to its utmost limit.

These lengthy exposures are at times slightly inconvenient, from causes which lie with the flowers themselves rather than in the operation of photographing them. For example, the delicate sprays and pendulous blossoms of some flowers are so nicely balanced that the slightest movement suffices to set them in motion and so destroy definition. It may be supposed that a slight movement in the course of a lengthy exposure would scarcely affect the general definition, on the ground that the leaves and blossoms would resume their original positions when the motion was past. This they no doubt do to a certain extent, just as foliage in a landscape does in the quiet intervals of a gusty day; but it must be remembered that cut flowers offer the disadvantage, that by a slight shake they may be altered in their relative positions with regard to one another—the group may, in fact, be slightly rearranged. And again, in the course of half an hour, especially in hot weather, a cut spray is liable to droop, at least in a slight degree, not sufficient, perhaps, to present any palpable difference to the eye, though it may seriously affect the sharpness of the photograph. A far less common difficulty has been experienced with flowers which possess the curious property of opening or closing their petals under certain conditions of light; and it can be readily imagined that a blossom which, fully open when the exposure commences, gradually closes during the impression of the image, or *vice versa*, stands but a poor chance of being satisfactorily rendered. Still these troubles, in a measure unpreventable, may be reduced to a minimum if proper precautions are taken.

The development is perhaps the most important part of the proceedings, though by no means difficult if the principles on which it is "fitted," so to say, to the exposure, be mastered. We have spoken of giving exposures extending to fifteen minutes where a few seconds would suffice to make a photograph with ordinary development; to apply the same treatment to a film which had received the longer exposure could have but one inevitable result, a thin, veiled image, entirely useless for printing purposes, if indeed it were not entirely lost in fog—a result, in fact, commonly described by the term "burnt up." To remedy this a liberal dose of restraining bromide is the first and most natural resource, but this introduces another difficulty; while it restrains the energy of the development and controls the formation of the half tones, this action is exerted most powerfully upon the more feebly im-

pressed portions of the film, and the final result is little, if any, better than before. For, up to a certain point, while the half tones and finest details are struggling against the check, the high lights—the delicate blossoms—are acquiring density, and by the time the shadow details are produced, will have entirely lost all traces of gradation.

We have, then, to adopt means by which the “piling on” of density in the high lights is arrested during the time requisite for the gradual production of detail, and this is done by so constituting the developer as first applied that it is incapable of giving a dense image. To secure this end we greatly reduce the quantity of pyro employed; instead of the usual strength of three grains to the ounce, let it be reduced to one grain, or even half a grain. The effect of this will be that though the rapidity of the *appearance* of the high lights is in no way checked, they advance to a certain strength, at which they stop, however long the application may be continued, while at the same time the half tones and details are making steady if slow progress, and the outcome is a thin, flat, apparently useless image. But though so evidently lacking in contrast, the film retains in its better exposed portions a reserve of energy, or a capability for density, that upon washing and re-treating with a solution calculated to give density it at once acquires vigour, the high lights coming up to printing strength in a very short time, if not immediately; indeed, so rapid is this intensifying action that this portion of the process must be considered the most delicate and “ticklish” of the whole. Either alkaline, pyro, or silver intensification may be adopted, but we prefer the latter on account of its slower and more regular action, though it is true greater precautions are required in removing the hypo, for this must be performed after fixing. If alkaline pyro be used a strong addition of gallic acid may be used with advantage.

The exact details of the manipulation must of course depend upon actual circumstances, for no strict rule can be laid down; but if these lines be followed, success will not be difficult of attainment, and the quality of result will be superior to any that can be obtained by quicker development. The use of orthochromatic plates will form the subject of a separate article.

DEMONSTRATION by aid of the lantern is now a regular feature in the Public Schools of the district of Prescott, Ontario, having been recently introduced by the Rev. Mr. Blair, the Inspector of Public Schools there. This offer on the part of the Inspector is being gladly received and co-operated with by the teachers, trustees, and parents throughout these parts.

SOME little time ago a method of making oxygen without a retort was published, and after going the rounds of the scientific papers was little heard of again. As, however, we have recently seen the plan resuscitated, it may be as well to observe that it is entirely inapplicable where economy is at all to be considered, as the following calculations will readily show. Two pints of oxygenated water, an ounce of permanganate of potassium, and a pound of sulphuric acid, are mixed in the specified manner, and the product is five gallons of oxygen. These ingredients well bought could not be had for much less than three shillings, so that we may put down the gas as costing about sevenpence a gallon. We are so accustomed to estimating oxygen by feet rather than gallons that the unthinking might not note the difference; but when it is remembered that six and a quarter gallons go to make a cubic foot, and that thus an ordinary size gas bag would cost a guinea to fill, we think that few of our readers would exhibit their photographs by the aid of the optical lantern if such an expenditure as this were necessary.

In a recent number of the *Comptes Rendus*, M. E. Duclaux narrates some interesting experiments upon the relative powers of heat and of solar radiations to bring about certain chemical changes. A large number of organic compounds containing carbon, hydrogen, and oxygen were subjected to the action of heat and of solar radiation in the presence of air, nitrate of silver, chloride of gold, chloride of platinum, permanganate of potash, and other oxidising agents, with the result that all reactions of the nature of combination that can be brought about by the action of heat can be likewise brought about by solar radiation. The converse, however, does not hold good, for it was found that several decompositions that the sun's rays were instrumental in producing could not be established by heat alone. It was found that when permanganate of potash was used it acted in many cases in the dark, the ultimate products being identical with those obtained by sunlight.

THE use of the electric light in photographic portraiture being no longer confined to a single studio, it may be well to bring before our readers some account of a paper read by M. d'Arsonval at a recent meeting of the Paris Academy of Sciences, upon the subject of fatal accidents through the accidental interposition of the body in an electric current. Our readers may remember that the gentleman who had charge of the electric light in the first studio in this country where this mode of illumination was employed adopted the invariable plan of keeping one hand in his pocket when adjusting the carbons, so as to avoid all possibility of receiving a shock by the incautious handling of both points at once. There are, of course, other times and occasions where danger lurks, and, though fortunately there are no records of death through electricity in photographic operations, it will be well to be prepared for any *contretemps* that may thus occur. Passing by the theoretical part of M. d'Arsonval's paper, we arrive at his summing up, wherein he states that, in accidents under the conditions usually realised, the current kills by reflex action; “and,” he says, “I have succeeded in the majority of cases in restoring to life animals that have received shocks by subjecting them to artificial respiration. The practical conclusion to be drawn from this note is that it is necessary in electrical works to be able to practice at a moment's notice artificial respiration upon any one who has received a shock.” In relation to these remarks, M. Brown-Séguard describes a method that has been successfully employed by the Collège de France in bringing back arrested respiration, which he states to be far superior to that employed by Faure and others. “It consists simply in the application of a faradic current to the sides of the larynx on the skin, which is moistened or superficially excited. . . . We have found in comparative experiments, which remove all doubt, that, of all parts of the body, that which, being galvanised, has the greatest power in restoring respiration is the one we have mentioned.”

IN photography and the arts generally, the much-valued albumen of eggs has, for the sake of economy, often to give way, wholly or in part, to albumen from other sources, and there is a widespread idea that some of the nauseous-smelling albumenised paper from a foreign source met with in commerce is innocent of the most remote connection with feathers. But it has been reserved for the electricians to utilise still another form of (so-called) animal albumen. We read that a French Company employs on a large scale a method of electroplating organic bodies, such as flowers and insects, by the aid of an albuminous liquid obtained from snails or slugs, the mode of preparing which we detail for the benefit of those of our readers who may wish to try its capabilities in photographic operations. “Snail paper” would be a novel variation upon the well-worn title, “albumenised paper.” “A quantity of snails or slugs is first washed in ordinary water to free them from calcareous or earthy matter. They are then placed in a vessel containing distilled water, and are here left a sufficient time to give off slowly their albuminous matter. The albumen thus obtained is now filtered, and boiled for about an hour.” It is to be observed that as no coagulation is anticipated at this stage of this process, the substance must be very dissimilar to that ordinarily known under the name of albumen. Perhaps gelatine would be a more suitable term to employ: we then might have “snail plates.”

WE have kept our readers *au courant* with all matters relating to the Paris Congress on star charting by the aid of photography, and we have now to chronicle the close of the Congress. All working details are arranged, and various committees appointed for different phases of the routine, and the working out of the plans decided upon. One sub-committee was appointed to occupy itself with "the applications of photography to astronomy other than the construction of the map, showing the importance of all these applications and the relations which it is important to establish between these different kinds of work." Mr. Common and M. Janssen were appointed to carry out this portion of the plan.

EXPERIMENTAL work of various kinds in connection with the decisions of the Congress was divided into ten classes, those only of which that will interest our readers being Nos. 5 and 9 on the list. The former, entrusted to the observatories of Algiers, Mendon, and Potsdam, consists in a "Study of the deformations of films." The last but one (9), and perhaps most important in the list, is, "The study of formulae for the preparation of plates in accordance with the general rules laid down by the Conference." One of our countrymen is again put to this important labour, the name of Captain Abney being linked with that of Professor Eder.

PAPER NEGATIVES IN ORDINARY SLIDES.

THAT we have reached finality in regard to the mechanical arrangements for the exposure of paper or film negatives, no one will, I think, yet claim, though certainly it must be confessed that a vast amount of care, attention, and undoubted mechanical skill have been lavished upon the task. The roll holders or roller slides leave apparently little to be desired or expected so far as their fitness for the purpose intended is concerned, and film carriers are so numerous and ingenious in their construction that it seems well nigh impossible to suggest a new form.

Yet, despite the mechanical perfection of the modern roll holder, it cannot be denied that a certain amount of prejudice exists against it; it is almost as if it were *too* perfect a piece of mechanism, or only short of absolute perfection in its failure to work automatically instead of requiring, as it does, a considerable amount of methodical care in its use. I have had two or three days "out" in company with possessors of roller slides of various makes, and these happy beings, though mightily proud of their mechanical toys, seemed to pass the time in a constant fever of anxiety as to whether they had strictly performed that which they ought to have performed, and left undone that which they are told not to do. First, it is a question whether the machine has been wound up to three "clicks" or four, then there is a doubt as to whether it has been set since the last exposure or not, and it is scarcely to be wondered at that, in the bother of deciding these important matters, count is lost of the number of actual exposures made. The last trouble may of course happen with double slides, or, better still, with a changing box, but there is then less excuse for it, as the operator then has no distracting mechanism to draw his attention from his legitimate business.

Then, as regards the film carriers, all those that I have seen are either unnecessarily bulky or heavy, or unwarrantably expensive for the work they are expected to do, and leave much to be desired in the direction of an entirely new form of slide for film work. But even this I know would not satisfy everybody, however perfect it might be, for there is a strong tendency to cling to old associations and existing apparatus. Many men—myself, I confess, amongst the number—are unwilling to go to the expense of new slides while the old ones can be utilised, or to have existing apparatus altered to suit a new "fad," which may prove to be but a passing one, and such, failing a really efficient "carrier" at a moderate price, are likely to adhere to the use of glass, or else cast about, as I did myself, for a home-made substitute.

The problem is to utilise the ordinary double slides without in any way interfering with their employment for glass, if necessary. The film carriers already in the market are devised on this principle, but, as I have remarked, they are either too clumsy or too expensive. The neat and efficient Eastman carriers are very good for American slides, but they are too thick for the lighter class of English portable backs, and

probably to make them any thinner would be to destroy their efficiency. The same thickness of wood as at present employed would answer equally well for a *double carrier, i. e.*, for carrying two films instead of one, if it were provided with a double metal flange, but it would then necessitate a slide made specially to suit its thickness, or the slabs of wood would have to be planed down to the dimensions of each individual slide, a rather inconvenient arrangement for English photographers.

The first idea that suggests itself is naturally the old one of exposing through a sheet of glass laid in the slide, and against which the paper or film is pressed; but this has several disadvantages, chief of which is the necessity for allowing for the thickness of the glass in focussing. My own experience with this method, working as I did paper and glass at the same time, is that when one of the paper slides went in to the camera, I managed to recollect it was paper after the exposure was made without alteration of focus; but as I was working 12×10 with an eighteen inch focus lens, the result was not entirely ruinous. However, the first day's experiment led me to vary the process by placing the paper in front of the glass, laying it carefully down in the rebate of the slide, and placing the glass upon it to press it and keep it in position. So far it was moderately though not perfectly easy, for a 12×10 sheet of gelatinised paper is not quite as tractable as a rigid piece of glass, wood, or metal, under the circumstances; but when it came to *closing* the slide, I felt inclined to exclaim, "*Ille labor, hoc opus est!*" for then indeed the trouble commenced. Whether the paper created any greater tendency on the part of the glasses to leave the rebates I cannot say, but it is certain they *did* every time I tried to close the slide, and of two sheets that I did eventually succeed in "fixing" one got torn by the sliding shutter, a corner having managed to escape from the rebate on the under side. For smaller sized negatives, however, this plan answers fairly well as a makeshift; I have used it for papers $7\frac{1}{2} \times 5$ without trouble.

But in using the ordinary glass slide for paper or films a very great amount of space is wasted and useless material carried if only two negatives are placed in each, and it occurred to me long since that for travelling purposes the slides might be used for storage as well as for exposing purposes if a suitable carrier, much thinner than those usually employed, could be devised. During the winter months I have endeavoured to develop the idea and think I have succeeded fairly well, though it is true the system has not yet been put to the test of actual practice on a journey.

The plan as originally conceived was to construct a number of inner frames, or carriers of cardboard, each to hold two films or papers separated by some non-actinic medium, and to be of such thickness that two, three, or more would just fill the space in the slide usually occupied by the two glass plates and intervening metallic shutter. In this manner each slide would carry, in addition to two surfaces ready for exposure in the ordinary manner, a reserve of films which only require their positions in the slide changing in the bedroom of the hotel at night, to bring two fresh exposures into position.

I constructed a number of double mats of cardboard, glued together along three edges, the fourth being left open to receive the two sheets of gelatino-bromide paper with an intervening leaf of opaque paper. But the process of making was troublesome, the carriers were fragile and easily damaged, very difficult to keep flat, necessitated the use of paper smaller than the glass plates for which the slide was constructed, and, finally, required an alteration of the focus to compensate for the thickness of the cardboard. It then struck me to cause the papers to adhere to a single sheet of cardboard, but the difficulty was to find a suitable adhesive. I tried first of all diachylon, as suggested I think by Professor Stebbing, but I am sorry I cannot congratulate him on having led me to victory; the paper adhered but slightly when it ought to have done, and peeled away in a very reluctant manner when required, and the traces of the adhesive left on the back caught and harboured dirt to an extent that would have utterly ruined any negative. Next I tried gumming or gluing the edges of the sensitive paper to the card, but this necessitated the *cutting* of the exposed sheet, leaving a narrow strip adherent to the card support, and so increasing the thickness of the latter with each exposure, as I found it quite spoiled it to remove the strip by damping. However, the idea seemed an improvement, so I next cast about for a support

that would stand the damping-off of the edges of the exposed sheets. This I found in very thin sheet ebonite, which I obtained without much difficulty, about the thickness of a visiting card, or perhaps a little thicker, flexible, and translucent, or even transparent to a strong light. This last raised a doubt in my mind as to the safety of the ebonite as a division between the two exposures, so I had to make a further search and at last hit upon ordinary ferrotype plates, which are even thinner than the ebonite, cheaper, and, what is of more importance, quite opaque.

I do not know whether all ferrotype plates are the same thickness, but they can be obtained up to fourteen inches by ten inches in size at about six or seven shillings a dozen. Mine I ordered cut to the size I wanted, and I find that under pressure about a hundred of them go to the inch. With two thin negative papers attached I can comfortably get a dozen—that is two dozen exposures—into the ordinary double slide; so that with the usual equipment of three double slides, six dozen plates, or rather films, can be taken on a tour in the same space as many single glass plates. There is no liability to damage from contact with impure packing paper nor from scratching, as the sensitive films are pressed gently but firmly in contact with one another, and if ordinary care be taken in handling them when the slide is opened they are as safe as if in grooved boxes. There is sufficient “bend” or “spring” in the plates to make the block somewhat elastic, so that it “gives” to the pressure of the rebate of the slide, and so the two outer exposures are kept accurately pressed into correct focal position. When two exposures have been made it is only necessary to remove one carrier to the opposite end of the block, and this will bring two fresh surfaces into use; if this be done methodically, say, from the odd to the even numbered side of the slide or *vice versa*, no difficulty can occur about wrong exposures.

C. BECKETT LLOYD.

(To be continued.)

ACCESSORIES OF THE LANTERN.

CHAPTER VIII.—THE MIXED GAS JET.

THERE still exists among makers of mixed gas jets much misapprehension of the principles that have to be adhered to, in order to obtain the best results. Many jets in the market which are made on the mixed gas principle—in that both the gases, oxygen and coal gas, have to be put under heavy pressure in separate gas bags—are so defective that they yield a light of less power than an ordinary blow-through jet. Some that have been tested could not be made to give a better light than 150 candles, and few of the better class jets are more powerful than 300 candles, even with a high gas pressure.

A good open, or blow-through, jet gives a light of 200 candles; and a properly made mixed gas jet, burning coal gas as the hydro-carbon, should be capable of giving any power of light between 200 and 600 candles, according to the gas pressure.

If pure hydrogen was used instead of coal gas, the available aperture of the jet nozzle would be lessened, and the best light that could be had would probably not then exceed 300 candles. It is found that the aperture from which the gases issue cannot be enlarged beyond a certain size, as either a roaring noise is produced or the flame of the burning gases passes back into the mixing chamber and the light “goes out.” Hence coal gas is far superior to pure hydrogen for limelight purposes, as it admits of a larger aperture being employed, and this causes a corresponding increase in the illuminating power of the jet.

It is interesting to compare modern jets with the apparatus used in 1820, when the limelight was first applied by Lieutenant Drummond, the inventor, to lighthouses. A book on science, published over fifty years ago, gives a woodcut and description of the original apparatus, or “lamp,” as it was called, the appearance of which was as unlike the jets now made as it well could be. The lime was not a cylinder, but was of the shape of a small marble, three-eighths of an inch in diameter. This ball was perforated and strung on a vertical platinum wire. There were two long nozzles, like jewellers’ blow-pipes, proceeding from a mixing reservoir for the gases; the points of these nozzles were turned toward each other, and the lime ball was placed between the two points. There were thus two flames acting on opposite sides of the little ball, which would consequently throw

off light in all directions. The power of this double limelight is stated as being only equal to 122 wax candles, and yet the gas pressure was that of “about one atmosphere!” The little ball was made to revolve by clockwork, which also allowed it to slip down the platinum wire after being in use forty minutes, another ball falling into position between the two blowpipes at the same time. Pure hydrogen was used, the quantity of the gases burnt per hour being four cubic feet of hydrogen and two of oxygen. All lanternists will feel grateful for Lieutenant Drummond’s invention; but for his ingenuity we might now be compelled to choose between an oil lamp and the arc light for the optical lantern.

Those who used the limelight in its primitive form adopted very small apertures in the blowpipes, through which the gas was forced at an extreme pressure. The mixed gas jet was, in consequence, styled the “high pressure” jet, a title which is not so applicable now, as we can get an excellent light with a low pressure, such as that produced by a half-hundredweight, on a gas bag of eight cubic feet capacity. Owing to the force with which the gas issued from the jet, and also in part to the faulty construction of the nozzles, it was found that brass nipples sometimes become corroded and rotten by the action of the great heat if the limelight was kept in use for a long period. In order to avoid this wearing away of the nozzles, the custom was introduced of tipping them with platinum; and although it is a fact that jets made on modern principles—having large apertures, and working with a low gas pressure—are not a whit better for having the more expensive platinum tipped nipples, but are really worse off than if they had brass ones, yet the makers still adhere to the old custom, and the catalogues of opticians always mention, as a special virtue, that their best jets are tipped with platinum.

The reason why platinum tips are not advisable with the large apertures, is that it creates a discontinuity of the metal near the extremity of the nipples, which in a short time detracts from the smoothness of the internal surface. The result is that a small eddy in the issuing gas is caused, accompanied by a roaring noise, and the nipple is gradually destroyed by the corrosion of the brass at the point where it joins the platinum.

If platinum must be employed, the entire nipple should be made of that metal; such a nipple, one inch long and a quarter of an inch diameter at the larger end, would be very expensive compared with brass, but it would be practically everlasting. Platinum being a very poor conductor of heat, a nipple of this metal is not heated to the same extent as a brass one, hence a somewhat larger aperture can be employed; this advantage, however, is only to be obtained by having the platinum about one inch long. Brass nipples answer every purpose, as they will remain serviceable for a hundred exhibitions at least.

The internal construction of the nipples is a point of great importance. The bore is made by drilling the nipple through one-third of its length so as to leave a hole one-eighth of an inch diameter; the remaining portion is then perforated with a smaller drill. There is thus left a shoulder in the bore, which interferes with the flow of the gas and tends to create a roaring noise when the jet is in action. This shoulder should be removed by inserting a specially made rimer, and the bore rendered as near like a cone as possible, and with a perfectly smooth surface. The same system of cutting away projections should be followed at the place where the nipple is screwed to the nozzle leading from the mixing chamber.

The real secret of getting a powerful noiseless light with mixed gas jets is simply to have the current of gas, issuing from the nipple, perfectly smooth and free from eddies. A simple way of testing a jet is to blow air through it with moderate force; if there is a hissing noise at the nipple, the jet will hiss when used for the limelight; if it is noiseless when tested with the breath, it will probably be noiseless in the lantern. The size of the orifice of the nipple should be one-sixteenth of an inch in diameter for discs of fifteen feet; when discs of about twenty feet are desired, the aperture may be increased to one-twelfth of an inch. If the bore is made larger than one-twelfth, it will be only workable with a high gas pressure; with a low pressure the flame would “pass back.”

The external shape of the nipple may be a cone, the apex of which should not exceed one-eighth of an inch in diameter. There is a happy medium to be adopted in the thickness of the metal surrounding the bore—it should not be as thin as paper, as then it would not last long;

on the other hand, if there is too much metal round the orifice, the light issuing from the lime will be obstructed to some extent, and by the undue heating of the nipple the flame may travel back to the mixing chamber. A brass nipple of large aperture will work well in this respect if its diameter, at a point half an inch from the apex, is made three-sixteenths of an inch, and the shape is a cone tapering to one-eighth of an inch at the orifice.

The nipple should be put at an angle of 45° with the lime pin. This angle will be found to give the brightest light. The lime pin need not be upright; it is preferable for it to make an angle of 20° with the vertical, so that the light will be thrown downwards to a slight extent, and there will be then no possibility of the nipple causing a shadow on the screen during a lantern exhibition. ALBERT WM. SCOTT.

ON STEREOSCOPIC WORK.

[A Communication to the Manchester Photographic Society.]

IN bringing before the Manchester Photographic Society on this occasion the subject of stereoscopic work, it may be that I shall lay myself open to a suspicion of plagiarism, since within the last few months papers on the same subject have been given at various other Societies in different parts of the country, and these have been also further supplemented by direct communications to the photographic journals.

Having, however, had it in my mind since the commencement of the present session to prepare such a paper in readiness for a favourable opportunity of communicating its contents here, I have purposely abstained from reading up current matters on the subject, so that I should thereby be more likely to pursue an independent line of thought.

It has been matter for surprise to many people who are conversant with the history of the stereoscope, that an instrument of such scientific value, which, when used in conjunction with suitable photographs, is capable of imparting both instruction and real pleasure, should have enjoyed a lease of only some twelve or fifteen years popularity, and then began to decline so rapidly in public interest that in less than thirty years from its introduction to the scientific world in a practical shape it should have fallen almost completely into disuse. Whether it was that the exceptional favour with which the instrument was received when its capabilities became known gave rise, as is usually the case in such circumstances of sudden popularity, to inferior productions of the "cheap and nasty" type, or whether it was that the vile rubbish in the shape of stereoscopic slides, rapidly drifting into the region of the indecent, with which the market soon became flooded, and which largely contributed to the passing of Lord Campbell's Act for the suppression of vice, is not for me to say, but the fact remains that just as quickly as the stereoscope had risen into popularity only a few short years previously, so quickly did it begin to decline in favour, and in a very little while, as if suffering from the effects of evil companionship, it seemed to be tacitly regarded as an instrument of barely average respectability.

As regards the optical principles on which the construction of the stereoscope is based it is not so much my present intention to deal, that part of the subject having been ably treated by several of the contributors of papers already alluded to, as well as by a series of chapters in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for the present year by Mr. J. Traill Taylor, whose thorough grasp of the most abstruse problems in optical science is all but universally admitted. My object is rather to point out the utility of the stereoscope as a means of giving a more accurate idea of the natural form, proportion, and relative distances of the parts in a photographic picture taken specially for binocular inspection than can possibly be formed by looking at the same picture when taken microscopically, or by means of one lens only, and in that view of the matter to point out the educational value of the stereogram to artists who have not many opportunities of making their drawings direct from nature.

Moreover, I think it will be admitted that an attempt to revive a taste for stereoscopic work is not inopportune in this Society at the present moment, seeing that I am now addressing what may be said to be practically an entirely new generation of photographers, amongst whom the stereoscope and its powers are, to a considerable extent, very little known, although the means of producing suitable work for the purpose are now, by reason of the present exalted rapidity of gelatino-bromide plates, vastly superior to what they were a dozen or so years ago.

It is true there have not been wanting of late years occasional

though it must be admitted tardy, indications of a revival in stereoscopic work, which have led some sanguine people to express the opinion that before many more years elapse this almost forgotten branch of photographic art will be again to the fore, and in greater force and beauty than ever. Personally I see no reason why this desideratum should not come about quickly; on the contrary, there is every reason that it should.

I hardly need point out that the principle of the stereoscope consists in the union of two pictures dissimilar from each other in so far as that they are photographed from two slightly different standpoints, the difference between those standpoints being about equal to the average distance between the two human eyes, and thus a third picture is formed in the stereoscope by the superposition of one image on the other; the resulting combination being conveyed to the brain gives the same idea of solidity and relief as that derived from the actual sight of natural objects. The principle is readily illustrated by the simple expedient of photographing, by means of a binocular camera, a ball, on one side of which a black cross has been made. In the example shown you will perceive that the cross is perfectly rendered in the view taken by the left-hand lens, whilst the right-hand lens, being a different point of sight, does not depict so much of the cross on that side as to give a completely detached image of it.

The principle of binocular vision was known to Euclid, and dilated upon by him in his treatise on optics more than two thousand years ago. The subject was also further treated upon some centuries later by the celebrated Greek physician, Galen, and still more recently by Baptista Porta, Leonardo-da-Vinci, Agnoloni, and others; but the idea of uniting the two dissimilar pictures as seen by the right and left eyes by means of an instrument, afterwards to be called the stereoscope, first occurred to Mr. Wheatstone in or about the year 1838, when he contributed a paper on the physiology of vision to the British Association, then being held at Newcastle, and exhibited an instrument which subsequently became known as Wheatstone's reflecting stereoscope.

I have here a sketch, or diagram, of this instrument; but the stereoscope did not become popular until it appeared in a greatly improved and more portable form from the hands of Sir David Brewster, about the year 1852, at which period Archer's collodion process had just been made public property, and it was a process supremely adapted to the production of stereoscopic work. About this period, also, Mr. Dancer, an optician, then of great repute in this city as a scientific pioneer, introduced the binocular form of camera, by means of which, with its twin lenses, the operator was able to take the two pictures with one exposure, thus obtaining an uniformity of light and an identity of conditions which could not be satisfactorily secured where two separate exposures had to be made, as in the case of the Latimer Clark principle, where the camera was mounted on an arrangement of parallel levers of the nature of the pantograph and the two exposures made separately.

The use of stereoscopic photographs for book illustration suggested itself, more than thirty years ago, to Professor Smyth, when he tried the experiment in his work on *Astronomical Observations at the Peak of Teneriffe*, in order, as he tells us in his preface, to keep a salutary check on the pencil, or long bow, of the traveller. Photography was, however, at that time too much in its infancy to bring out the true value of such a method of book illustration, although the work was extremely well received at the time, and fully bore out the wisdom of the experiment. If, however, with the improved means we now possess of dealing successfully with life and rapid motion, I venture to think that such a plan of illustration, especially in the case of standard works on science, would be both wise and profitable.

It has been objected as against stereoscopic pictures that they fail to give a true idea of the incidents of life and motion as seen in nature, and that there is a certain rigidity about them which, as I understand the spirit of the objection, is somewhat analogous to a human being in a state of catalepsy—where you have the form and semblance of life, but at the same time you have the stillness and fixity of death. I admit that there was considerable force in the objection at the time it was made, when long exposures were a necessity, but the criticism does not now hold good with the means we have within our reach of securing instantaneously the fleeting and ever varying effect of nature.

Again, the superiority of a stereoscopic over a monoscopic picture is attested by the fact that the latter can easily be made to misrepresent a subject, whilst in the former case such treatment is practically impossible.

I remember once being concerned as a witness in an arbitration case, where the plaintiff's counsel, after stating his case, pointed triumphantly to some photographs which had been taken to establish the justice of his case, with the remark that the sun could not lie;

whereupon the opposing counsel, who seemed to know a thing or two, or thought he did, on these matters, proceeded to explain in technical language that by doing so and so, and omitting to do something else, the sun could be made to lie, and lie most vilely.

Further, we all remember that not very long since Mr. Heywood showed on the screen, at one of the lantern meetings, how an innocent negative was caused to tell a deliberate lie, by representing a small jutting rock of only a few cubic feet dimensions as a frowning precipice of mountainous magnitude.

I am not greatly surprised at the fact that most artists of eminence rather eschew the method of copying their works direct from photographs (of course, I am now speaking of pictures taken by one lens only, and not stereoscopic pictures), especially in the case of landscape painting, although both Mr. Walker, of the Owens College, and Mr. Madox Brown have expressed to me their high appreciation of the help which photography gives to the artist in matters of detail, such as the form and anatomy of all varieties of trees, rippling water, sedgy foregrounds, and the like; but as regards the picture, as a whole, no artist who has a proper conception of his work will trust to a monoscopic photograph as his sole guide when he has the opportunity of seeing with his two eyes the real scene as depicted by nature herself.

I do not set myself up as an artist, either in practice or judgment, but amongst the very few accomplishments acquired in early life I learned to draw a little, and the pursuit is still a very enjoyable pastime when I have leisure to practice it.

I have here a copy of a drawing made by me a few months ago; it was sealed out as carefully as possible by the help of a simple view meter of a kind often used by artists, namely, a rectangular opening, of the same proportions as the boundary lines of the picture, cut in a piece of cardboard, and held at such a distance from the eyes that no more than the desired angle would be included, otherwise the work was entirely freehand, and for the time being the camera was abandoned. When the picture was completed, but not before, I took a photograph of the scene from the exact spot I had painted it from, using a lens to include the same angle of view.

I will say nothing of the two pictures thus produced, except that there is a marked difference between them; and, further, though at the risk of being thought egotistical, I think all will admit who know the spot that the drawing, though containing many imperfections, is more suggestive of the reality than is the photograph.

In the case of stereoscopic work, however, the photograph would not be similarly misleading, there would be no making the molehill into the mountain, nor *vice versa*. Everything falls into its right place, and a correct idea is given of the relative size and distance of every object that goes to make up the picture. There must, of course, be no tampering, even with the binocular camera, in the shape of tilting, swinging, or other unorthodox devices, in order to reach the top of a tall tree or spire, that is, if the truth of nature is to be faithfully recorded.

Since reading the above paper it was suggested to me that I ought to have said something about the mounting of stereoscopic pictures in order to make my communication more complete. I had, perhaps wrongly, thought the matter was of too simple a nature to refer to, but as I can supply the deficiency in a very few words, I will proceed to do so.

In the first place, I may point out the well known fact that all photographic lenses give the image on the plate in an inverted condition; consequently, in the case of a binocular negative, the image taken by the right-hand lens is seen on the left-hand side when the plate is turned round so as to see the picture in its proper non-inverted state; on this account, in mounting the prints, it is necessary to transpose the two halves by mounting the right-hand picture on the left-hand side of the mount, and the left-hand one on the right-hand side.

The transposition would, however, not be necessary if the stereoscopic picture were made, as it is sometimes done, by means of a quarter-plate lens and the camera moved laterally between the two exposures, because in that case there are two separate negatives, and each of them can be righted independently of the other. Then as regards the trimming of the prints, this must be done with great care, so that when the slide is finished the corresponding middle distance objects in each of the two pictures are, as nearly as possible, 2.75 inches apart, which amount may be taken as a safe average distance between two human eyes. Care must also be taken that the bottom edge of the picture cuts the objects off in one case exactly as in the other.

In trimming the prints, some people prefer leaving more subject on the outside margin, or the right and left side, so as to make the photographs look larger when mounted; but otherwise there is no advantage in doing so, as the overlapping portions are, of course, not stereoscopic.

For my own private collection of stereoscopic slides, I do not care to include paper ones at all, glass being so much superior as regards giving fineness of detail and general delicacy that no paper prints can approach them. The camera I use for making my glass transparencies, and which I have brought here for inspection, is simply an extended form of the ordinary binocular, having a partitioned front extension of two dark chambers so that no light can get to the lenses except that passing through the negative, which is placed in a carrier at the front, and the whole pointed to a northern sky. The transposition is made automatic by putting the negative in the carrier with the film side outwards.

I have already extended my remarks to far too great a length, seeing that there is other business before the meeting. I have done so, however, purely from a desire to give an impetus, it may be a feeble one, to the revival of this once popular, though now neglected, branch of photographic art.

J. S. POLLITT.

HALATIONS IN NEGATIVES.

CHAPTER I.

ALTHOUGH the subject of halation in negatives has frequently been brought under the notice of photographers, yet it has not received that amount of attention which its importance demands.

Photographic halation may be briefly defined as an encroachment of the high lights on adjacent shadows. The defect in its most aggravated form may be said to date from the time of the introduction of photography on glass, but no attempt at giving a rational explanation of the phenomenon seems to have been made until some years after Archer had introduced the iodised collodion process, when photographers, who had to delineate objects containing very abrupt contrasts of light and shade entailing a long exposure, were dismayed to find that the high lights had encroached on the deep shadows and interfered with the sharp definition of minute details. Especially was the evil noticeable in photographing interiors—cathedrals for instance, where a window formed a portion of the picture to be taken. In such cases the sash bars and mouldings, instead of being sharply defined, were all but obliterated in one blaze of illumination. Various conjectures were, from time to time, thrown out as to the cause of this peculiar phenomenon, but it remained for Mr. Marlow to discover the true cause, and he, in the year 1861, contributed a paper on the subject to the Photographic Society of London. In this interesting communication Marlow ascribed the phenomenon to the passage of the strong beams of light, first through the film of iodised collodion and then through the glass, from the posterior surface of which they were reflected back into the film at points different from those by which they penetrated it. As a necessary consequence portions of the sensitive medium were actinically affected by radiations which did not come direct from the lens. A diagram accompanying Mr. Marlow's communication rendered his explanation easily comprehended. Although the demonstration was complete, still photographers seemed to treat the matter with great apathy and took no steps to apply an efficient remedy.

Some years afterwards when Major Russell, ignorant of what Marlow had done, introduced his dry process with bromised collodion and alkaline development, he not only proved Marlow's theory to be the correct one but devised a very efficient remedy, or rather preventive, which consisted in destroying the reflecting power of the glass surface by backing the plate with a coating of a non-actinic pigment, such as sepia, &c. The pigment was easily washed off after exposure and previous to development.

It may here be mentioned that bromised films are much more liable to these back reflections of injurious light than are films which consist mainly of silver iodide, inasmuch as light in passing through this latter medium must necessarily be reflected back of a less actinic character than when it has to pass through the whiter and, therefore, more actinic bromide.

But besides preventing optical halation or, as Russell termed it, *blurring*, the backing of the glass plate with non-actinic pigment in optical contact with the surface confers other advantages, inasmuch as transmitted light is thereby absorbed while the sensitiveness to weak radiations which do not pass through the film remains the same. Moreover, solarisation of the high lights does not set in so soon as would otherwise be the case, and details in them, such as clouds in the sky, will bear much longer exposure without being obliterated. Nevertheless, we must not expect that the most perfect kind of backing will altogether prevent optical halation in cases of strongly contrasted lights and shades and protracted exposures, inasmuch as every known body, however non-actinic its colour and non-reflecting its surface may be, will eventually when strongly illuminated, reflect

sufficient light to give a picture in the camera. Yet there can be no question but that by means of a light absorbing backing, the capability of faithfully rendering violent contrasts of light and shade is greatly extended, so that we are thus able to give a much longer exposure for details in the deep shadows before the actinic rays from the high lights can effect any injury by reflection.

It has been proposed to stain the film with some non-actinic dye so as to prevent injurious light from passing through and being reflected from the back surface. Such a plan would certainly prevent optical halation, but then it has the great drawback of preventing light from penetrating the film and therefore cannot be recommended. When we bear in mind the fact that the image, in an alkaline developed film, is entirely derived from the silver bromide within it, it will readily be seen that the high lights must necessarily be destitute of vigour because light has not been able to penetrate the film sufficiently deep to render the bromide therein amenable to development.

Having thus briefly glanced at the cause of, and remedy for, optical halation, I propose in another chapter to append a few observations on another class of defects to which bromised films are necessarily liable.

GEORGE DAWSON, M.A., PH.D.

THE RIVAL PHOTOGRAPHERS.*

HAVING stayed so long in Mr. A.'s studio, and treasured up all his remarks and sentiments as regards the photographic art, I think we can safely leave him and visit his rival on the opposite side of the street. If you are at all inquisitive, I feel sure you would like to know also what has become of the poor wretch who had such a warm time of it while trying for a "crib" in Mr. A.'s service. Well, I will tell you all about him.

This poor fellow had had a very bad time of it; business had been very uncertain with him, and he was fairly down in his luck. Any one with a spark of sympathy can fancy his feelings when leaving the studio where he knew he could do good, but where he morally got "the kick out." When at the door he took a last look at the show-case and, notwithstanding that it was such poor revenge, he experienced a feeling of satisfaction, for he well knew that such work would before long make Mr. A. smart for the disappointment he had had that morning.

Looking up he saw another photographer right opposite, and, while crossing, slowly wondered within himself what his luck would be there. Indeed, the question suggested itself if any one required a retoucher at all in these parts. He had a look at the show-cases and saw some very excellent specimens. Thoroughly good as photographs, and (oh, joy!) they were all *retouched*, and very well done into the bargain. He felt his only chance here could be that Mr. Z., through press of business, might require extra help. Hoping for the best he went upstairs and inquired for Mr. Z. He was occupied at the moment, but would be able to see him in a few moments.

While awaiting the arrival of Mr. Z. he had a look around the show room. The photographs, unlike those of Mr. A.'s, were all *retouched*. At a glance, too, he saw that he was in a house where really first-class work was being turned out. There was a general air of business about the place that gave him hope. Several sitters were waiting, and others were looking about, evidently wanting something and seeking for something to decide them in their choice. It struck our friend that this was the house doing the business, although he was told at starting that *all* the good work of the place was done by Mr. A. and Mr. Z. Truth to tell, they were the two leading photographers both for position and connection, as well as for excellence of productions. For he it well understood, Mr. A. was as good a photographer as could be found, and so, too, was Mr. Z., the only real difference being, the latter was more businesslike and consulted the feelings and opinions of his patrons, whereas his rival tried to teach his customers that what he considered best really was so. I need not say which gained the advantage.

You will be, no doubt, astonished when I tell you that the object of all this difference of opinion was the retoucher's art. The one would not have it at any price, while the other considered that, in judicious hands, it was most powerful in producing successful, if we must not say *perfect*, photographic portraiture.

Before he completed the round of the show room a smart, business-like man came over to him, and he felt he was in the presence of the proprietor.

"Mr. Z., I presume?" ventured our friend.

"The same. What can I do for you?"

"I am a retoucher," suggested our friend, and he anxiously hoped for the best.

* Concluded from page 297.

"And want work? Good!" He was a shrewd man, quick to understand, and kindly to deal with. "I will not ask you if you have any specimens—I don't believe in that system. Have you been to any other photographer in this town?"

"I have only arrived this morning, so could not make many calls. I have been, however, to Mr. A.'s studio over the way."

"Ah, yes! I don't suppose, though, that you got any work from there."

"He has not one *retouched* subject in his show rooms."

"No! He'd do more work, however, if he had. It is a great pity to see any one so positive in their opinions as to absolutely refuse a fortune. He is a splendid photographer, I do not know a better; but as for retouching, he won't hear of it. Of course you can see I have all my negatives retouched. I have a competent artist, and pay him a good price, and his work is most satisfactory. I do not patronise 'the cheap and nasty.' I want what is really good, and am contented to pay a fair price for it. Do you wish for *piecework*, or would you engage for the season?"

"I would prefer for the season."

"Well, the fact is I have an opening at this very moment. Indeed, had you not called, I would have inserted an advertisement in next week's BRITISH JOURNAL OF PHOTOGRAPHY. I have had an artist for the last three years, but his sight has become very weak. I recommended him to take a rest and have good advice, lest his eyes should become too feeble to continue at such trying work. I have given him three weeks' holiday, and if you like to take his place during his absence I have no doubt we can arrange. If we suit each other at the end of that time the season here will have begun, and there will be ample work for you for at least five months."

"I will be very pleased." Indeed, our friend was very glad to get fixed up, and more especially in a place where the proprietor took so active an interest in the working of his business as Mr. Z. seemed to. "May I ask what style of work you prefer?"

"I have no particular style to which I pin my faith. I consider *each* negative requires a special treatment, and a retoucher should use such means as he thinks best to enable it to yield a successful print. I do not wish my negatives to be over laboured. All my negatives have the utmost care bestowed upon their production, and I look upon retouching as a *necessary help* towards securing a pleasing and successful portrait."

"I am glad to hear you say so, as personally, although I have looked upon my line of work as absolutely essential to successful portraiture, I have always considered it a *help*, and as such should join the operator in producing a negative to yield the desired result."

"Certainly. I object strongly to the *preponderance* of retouching, or to its becoming obtrusively visible. Above all, I want judgment and discretion used in the treatment of my negatives. Of course I mean this generally. There are exceptional cases, I know, where customers require the most absurd alterations, but even these can be done with such judgment as not to ruin the general effect of the picture. I will show you a few negatives done as I prefer them, and you can tell me if your style will produce similar."

This was a sound, practical manner of treating the case. But, again, this was a photographer who thoroughly *knew* what he wanted. He knew to what degree retouching could help him in producing successful pictures, and to that extent he employed it. He did not, however, because he had his retoucher to fall back upon, relax his efforts to produce perfect negatives. On the contrary, he made every endeavour to make the retoucher's labours as light as possible by providing him with the best of negatives to work upon. In my own experience I have had many negatives that I scarcely knew what to do with them, they were so good. There was so little to do, and I knew if the photographer did not see a *lot of work* he would grumble at the price paid.

These cases were very embarrassing at times. I felt almost obliged to put a lot of work on to justify my price, as otherwise, judging by past experience, my customer would not be pleased. But where to put the required work was the trouble, as more than a small amount would tend to injure the negative instead of bettering it. The prevailing idea with the generality of photographers is that they pay for *labour*, not *judgment* and *artistic feeling*. To this fact may be traced many of the defects in the general run of the retouching of the present day.

Mr. Z., having left our friend for a few moments, returned with half a dozen negatives, just to show him what he thought upon the subject.

"Now, you see some of these negatives have very little work upon them, but there is enough to get the desired result in the print."

"Perfectly so. To work them any more would be to do them more harm than good."

"Now that is the class of work I want you to do for me. I want judgment, not dash away, to be the system upon which we work."

In a few words he stated his terms, which proved fair and satisfactory to both sides. Our friend accepted, and there and then started on his duties. At this moment a customer arrived, and Mr. Z. went to attend upon him.

"What can I do for you?"

"I want to be photographed. Are you the best photographer in this town?"

This was rather an odd question, and somewhat puzzled Mr. Z. It was not often he felt knocked out of time, but this question and the abruptness with which it was put very nearly did it.

"Well," said Mr. Z., "I would not like to flatter myself that I am the best photographer here, but I can guarantee that I will produce a successful portrait for you."

"You all say that, but your results fall very short of your promises. I may, perhaps, be a very difficult subject, but I have no objection to pay for extra trouble so long as I get a good picture. I have had some pictures done at Mr. A.'s studio opposite, and he promised me a really truthful likeness. I never saw such frights in my life. One would think I hadn't washed my face for months."

"Yet Mr. A. is a first-rate photographer."

"Well, if that's your opinion I'm off."

Mr. Z. saw at a glance where the trouble lay. The customer had freckles, &c., on his face, all of which could have been easily retouched away, but Mr. A. never sullied his pure art by a touch from a retoucher's pencil. Of course it was bad taste of this gentleman to dispute the correctness of the photograph. Still, bad taste or not, he would not have another batch similar, and was going when Mr. Z. stopped him.

REDMOND BARRETT.

ODDS-AND-ENDS.

[A Communication to the Manchester Photographic Society.]

It was my great good fortune to be very intimately acquainted for many years, and until the time of his death, with a gentleman who a long time ago, I think it was early in the forties, acted as Clerk of the Works for Mr. Brunel during the building of the first tubular bridge the great engineer erected, the one at Chepstow, and my friend was probably the first man to use photography as a means of reporting progress of work.

During the time the construction was going on, a young man, one of Brunel's gentlemen apprentices, was sent down, armed with a letter of advice and instruction by Brunel of most admirable character. From this letter I am able to give an extract that photographers as well as engineers may take a lesson from:—

"You will take," he said, "particular care to enter nothing but facts in your journal, and with this you must learn to understand what is meant by a fact. If you yourself measure anything, or see anything, you may state the result as a fact within your own knowledge, taking great care to be accurate in your measurements, and to make sure of what you think you see. If you are told anything by another person, or if the measurement is made by another person, however accurate or credible he may be, and even more competent than yourself to ascertain the fact, you can only state as a fact that you were told so and so, or that such a measurement was made by such a person. What you do not give in your own journal, therefore, as a fact of your own observation, you must always give only as said to be, and, if possible, give your authority.

"Next in value to accuracy of statement is extent of observation. It is of great importance to observe and record everything. For instance, the time occupied in drilling holes under every variety of circumstances, such as the dimensions of the plates, size of holes, liquid used, whether the plate be held firmly and perfectly steady or not, temperature, &c."

I think it would scarcely be possible to find better instruction to lay before the photographer, who is always face to face with extraordinary and ever varying phenomena, than is contained in this advice to a young engineer, and I should in any communications I may ever make to this Society wish to be as particular as to a fact as Mr. Brunel advised his pupil to be, and also that I should not be afraid to record everything, even though my observation may have been made and recorded before. On such a basis have I gone in this little paper on odds-and-ends. I have recorded trivial observations, and no doubt everything I have seen has been observed by most photographers before. So it must be; but as a teacher may often learn something in instructing an ignorant child, so may the most learned of us be instructed by those less experienced and of far less knowledge than ourselves.

Some of the work I have done during the past summer has been for the stereoscope, and though Mr. Pollitt has to give us a paper to-

night on stereoscopic photography, I dare say what I have to record will not clash in any great measure with what so experienced and so excellent a photographer will have to tell us.

My "stereographs" (if the word which it was attempted to naturalise about twenty-five years ago is still intelligible) have been taken in three ways: first, with an ordinary stereoscopic camera and twin lenses of about four and a half inch focus; secondly, with a quarter-plate camera, the pictures being taken upright, and the lateral movement being given by the legs of the tripod being moved in a given direction one after the other; and, thirdly, with the same camera used with a special triangle, in which is cut a straight slot about four inches long, the views being taken with the camera first held at one end of the slot and then at the other. So far as I can see the results of all three methods are the same in the stereoscope, and it is immaterial whether the camera be moved four or fourteen inches, except that in the latter case, I think, but have not had examples enough to be sure, the stereoscopic focus is lengthened. There is another difference, that of size, the two quarter-plate pictures giving an admirable size of view for the stereoscope, and one much superior to a pair of three and a quarter inch square pictures.

I have also taken stereographs by three different plans: first on glass, second on paper, third with one picture on glass and one on paper. The latter course was adopted in Norway for the sake of lessening the weight of my luggage, and because, however successful paper might be, I must have one glass picture of each view for the sake of obtaining a transparency from it. Of the two pictures on glass, taken with the twin lenses, nothing need be said except that though, of course, developed together, they never develop alike; one always commences a little before the other, and goes on a little faster. Probably this arises from the fact that the film is not quite of uniform thickness.

Of views on paper I have a few examples which probably would be passed, even by most photographers, without observation, but in which grain is very obvious when the view is critically examined; but it is a curious fact that detail in a photograph is shown with a distinctness in the stereoscope which even "the fierce light that beats upon the screen" (to jumble Lord Tennyson) and the enlargement of the magic lantern does not discover. This is shown in a view of the village of Buerbroe on the Hardanger Fjord. In the stereoscope the village is plainly to be seen in the distance, between the two great masses of rock, but the lantern fails to reveal the houses in anything like the same distinctness.

Of the third plan, paper and glass, I have several examples, and very fair ones, the grain having almost, though not entirely, disappeared. The pictures, however, are very unequal in the amount of detail shown, glass taking the palm in a very marked degree. The two pictures, however, when united in the instrument are almost as satisfactory as two glass ones would be. This assertion brings me to record another "fact," namely, that two very unequal pictures in the matter of printing or toning unite in the stereoscope with perfect effect. Of this I have one or two examples where a very light picture is mounted with a very dark one, but quite a satisfactory stereograph has resulted, nay, in some cases, I am inclined to think rather a better one than two fully and equally printed ones would have made.

There is one serious disadvantage in taking views for the stereoscope with only one lens, and that is, that the light and shade may vary considerably between the first and second, or if figures are in the picture, they will certainly move between the two. I have two or three examples of this where pictures, otherwise good, have been to some extent spoiled by the movement of figures, and one, that of the Buerbroe Glacier, where the stream issuing from the icy cave bothers the observer by refusing to focus properly.

Since writing the above, a friend of very long experience in stereoscopic work tells me that if the camera is moved more than two and a half or three inches, figures and other objects in the foreground are much dwarfed in appearance when seen in the stereoscope, and he points out to me that one of my pictures, where I remember the movement to have been about eight inches, is an illustration of this; it is also an illustration of another fault, mentioned before, for Mr. Muth, who sat as my figure, moved his position considerably between the two exposures.

By all means, then, let twin lenses be used if the best pictures are to result.

I should like to see a half size camera, or perhaps $7\frac{1}{2} \times 5$, which could be used in the following ways:—1. As a camera to take the full size views (half-plate or $7\frac{1}{2} \times 5$ as the case might be); 2. In which another front carrying two lenses might be put, and a division between them for stereoscopic purposes.

It is generally known, but not universally, I think, that it is possible to see stereoscopically without a stereoscope. To do this it is necessary that each eye should be directed to only one of the two

pictures, and the two should combine in the brain just as the two objects on the two retinae are combined in ordinary vision. It is not easy to do this at first, but a little practice will enable any one to acquire the stereoscopic faculty if he think it worth acquiring.

Let the stereograph be brought very near the eyes (it is advisable to select as markedly stereoscopic a subject as possible), and two indistinct pictures will be seen by each eye. Then move the stereograph slowly away from the eyes, and by-and-by, when it is about eighteen inches distant, after trying again and again, it will be observed that the four pictures have become three, but they are still out of focus. Then, by moving the view a little further from the eyes, focus will be obtained, and the centre picture will be as stereoscopic as though special lenses had been used. The only "fact" to record in this, is that the focus is lengthened at the moment that the stereoscopic effect is obtained. The other two pictures which are in view, one on each side of the stereoscopic one, must of course be disregarded, or they may be cut off by holding a card against the nose.

Having acquired this stereoscopic faculty, and finding that it could be exercised at considerable distance from the stereo slide, it struck me that if one could have the two pictures thrown on the lantern screen a very grand picture would be observed when the two were united in stereoscopic fashion. I therefore got Mr. Pollitt to make me a single lantern transparency, on which were both the right and the left eye pictures, and these two I projected on the screen, of course, side by side. The transparency is markedly stereoscopic when "squinted" at, if I may use that incorrect expression; but after many trials I decided that the projected picture, for a reason I cannot explain, was not so. There is considerable difficulty in observing the projected slide at all, for if you stand at either side of the lantern the perspective view of the screen gives two pictures differing in size, and which, therefore, will not coalesce; and even when you station yourself on the line of the lens, that is, directly above or below it, it is difficult to make the two pictures superimpose one another, and when at last you find the knack of doing it, stereoscopic effect is wanting. My impression is that whether you are above the lantern or below it (and you must be one or the other to get on the same line) the perspective difficulty comes in to spoil the effect; and if this is so, the centre of the lantern itself is the only point from which the view could be properly seen, and we cannot very well get there seeing that we are not salamanders.

So much for stereographs.

ABEL HEYWOOD, JUN.

(To be continued.)

CONTINENTAL PHOTOGRAPHY.

[Translations and Abridgments.]

THE VERSAILLES PHOTOGRAPHIC SOCIETY.

A FEW years ago a photographic society was established at Versailles, the seat of government of the French nation. M. Dutilleux is the President of the Society, which publishes reports of its proceedings in the only photographic journal in the world printed by lithography; the title of its journal is the *Bulletin de la Société Versaillaise de Photographie*, and it is printed by Messrs. Cerf et Fils, 59, Rue Duplessis, in that city. The Secretary to the Society is M. R. Gast, 11, Rue St. Victoire, Versailles. The number before us contains an article by the President about black prints, with the papers of the Compagnie de l'Autocopiste. In their process the image is printed upon parchment paper covered with bichromated gelatine. When the portions of the image not acted upon by light are dissolved off, the sheet is dried, then wetted again and placed on the press; it is next inked in the ordinary way with a roller, and copies are printed off. Special papers are made by the Company for the work. After the paper is sensitised with bichromate of potash it is placed to dry upon a sheet of glass dusted with French chalk. The same number of the journal contains an article on Eastman's paper for enlarging purposes; it also contains a memoir upon Balagny's films, and a paper upon the reproduction of engravings by photography. The last page of the *Bulletin* has the lithographed signatures of the President, and of the Treasurer, M. Gavin.

THE UTILISATION OF PINHOLE PHOTOGRAPHS.

An article by M. G. Ruckert in *L'Amateur Photographe* speaks of the photographs taken by means of a pinhole instead of lens, exhibited before the Photographic Society of France in 1866, and remarks that the system may be useful for some special purposes, such for instance as that of including an angle of view greater than any lens will give. M. Pribourg has made experiments and satisfied himself that the images given by pinhole cameras are geometrically true. Captain Colson, of the engineers, thinks that pinhole cameras can be utilised in topography; exact geometrical projections in perspective taken with

two cameras from different points of view afford a means of accurately measuring heights and distances. The paper is illustrated with a photo-lithograph of the Cathedral of Notre Dame, of much better quality than those usually exhibited as specimens of work done with pinhole cameras.

ICE LENSES.

The London correspondent of *Le Moniteur de la Photographie* writes to that journal that in the middle of the winter which has just elapsed a student made a lens of ice, with which he lit the pipes of some of the skaters on the Serpentine by means of the solar rays, an experiment, he says, which was first performed in the Polar regions by Dr. Scoresby, to the great astonishment of the sailors, for they could not understand why the ice did not freeze the beams of the sun. We may remark that Professor Tyndall at times would set fire, at the Royal Institution, to a little heap of gunpowder with rays from the electric arc concentrated upon the powder by means of a lens of ice. His explanation was that, although ice absorbs rays of certain wave-lengths, and is gradually melted thereby, other waves it does not absorb, and these latter produce the heating effect at the focus of the lens. It is wholly a question of the relative motions of the molecules of frozen water and the motions of the waves of light; when there is discord between the two, the discordant waves pass through the ice without absorption.

ON RED AND PURPLE CHLORIDE, BROMIDE, AND IODIDE OF SILVER; ON HELIOCHROMY, AND ON THE LATENT PHOTOGRAPHIC IMAGE.

I.

In this series of papers it will be my object to show: (1.) That chlorine, bromine, and iodine are capable of forming compounds with silver exhibiting varied and beautiful colouration, peach-blossom, rose, purple, and black. That these compounds (except under the influence of light) possess great stability: that they may be obtained by purely chemical means, and in the entire absence of light. (2.) That of these substances the red chloride shows a tendency to the reproduction of colours. It seems not improbable that the material of the infinitesimally thin films obtained by Becquerel, Niepce de St. Victor, Poitevin, and others in their experiments on heliochromy may be the red chloride. (3.) That these substances, formed by purely chemical means, constitute the actual material of the latent or invisible photographic image, which material may now be obtained in the laboratory without the aid of light and in any desired quantity. They also form part of the visible product resulting from the action of light on the silver haloids.

For more than a generation past the nature of the latent photographic image, that which forms the basis of development, has been in dispute. Two theories have been maintained. According to the one, the first effect produced by light is simply a physical change, predisposing the elements of the silver haloid to dissociation, so that when a reducing agent is applied the molecules so affected yield more quickly to its influence. According to the other theory, the invisible image is formed of a subsalt (subchloride, &c.). Observations which I published many years ago led me strongly to the first-mentioned of these theories. But of late years, results have been obtained not easily reconcilable with it. On the other hand, the theory that the latent image is formed of subsalt is opposed to striking facts. Silver subchloride, for example, is an unstable substance, quickly destroyed by dilute nitric acid. But I have formed a latent image on silver chloride, and after exposing it for five minutes to the action of strong nitric acid (s.g. 1.36) have developed the image without difficulty; the same with silver bromide. Evidently these images, which so strongly resisted the action of undiluted acid, could not be formed of simple subchloride and subbromide of silver, substances quickly destroyed by it.

In the desire to find a satisfactory explanation of the nature of the image based on adequate chemical proof, I have devoted nearly three years of laboratory work to this and to closely allied subjects. I am led to the conclusion that neither of the older views is correct. A truer theory seems to be deducible from the result of some experiments which I published in 1885, to the effect that the silver haloids were capable of uniting with certain other substances, much in the same way that alumina forms lakes. When a silver haloid was precipitated in the presence of certain colouring matters they combined with it, and though soluble in water, they could not be subsequently washed out. They had formed a somewhat stable compound, although the proportion of colouring matter was very small in comparison with the haloid; evidently much too small to represent a stoichiometrical composition. Now I find that a silver haloid may in the same way unite with a certain proportion of its own subsalt, which, by this union, quite loses its characteristic instability and forms a compound of great permanence.

Another explanation is possible; the subsalt may combine with the normal salt, not in the manner above described, but in stoichiometrical proportion, and this compound may be diffused through ordinary silver haloid. I have not been able to find any reaction decisive between

these explanations,* but the general behaviour of the substance seems rather to indicate the first named explanation as the true one. When the red chloride, for example, has been boiled with dilute nitric acid for a few moments to eliminate any uncombined subchloride, the proportion of subchloride left has never exceeded eight or nine per cent. in over thirty specimens analysed. If we took this to represent a compound in equivalent proportions, we should have to suppose the union of at least twenty equivalents of Ag Cl with one of Ag₂Cl, which is improbable. If we suppose that these coloured substances containing from less than one-half per cent. up to eight or nine per cent. of Ag₂Cl consist of a compound of one equivalent of subchloride united to a small number of equivalents of normal chloride, mixed mechanically with a large quantity of normal chloride, then it would be improbable that specimens could not be obtained containing a larger proportion of this compound and consequently of Ag₂Cl, but, as already said, specimens containing more than nine per cent. after thorough treatment with nitric acid to remove the uncombined subchloride I have never obtained; generally the amount is less.

Even when silver chloride, bromide, or iodide contains as little as one-half of one per cent. of subsalt combined, its properties are greatly changed. It has a strong colouration, and its behaviour to light is altered. Even a much less quantity, one inappreciable to analysis, is capable of affecting both the colour and the behaviour to light. It is one of these latter forms of this substance that constitutes the actual material of the latent photographic image. Adequate proof of this will be given in the second part of this paper.

RED SILVER CHLORIDE.

Of the three haloids, the chlorine salt is the most interesting, because of its relations to heliochromy; it is also the most stable of the three compounds, and exhibits, perhaps, a finer variety of colouration, though the bromide and iodide are also obtainable of very beautiful tints. The chloride shows all the warm shades from white to black through the following gradations: white, pale flesh colour, pale pink, rose colour, copper colour, red-purple, dark chocolate, black.

These compounds are obtained in an endless variety of ways: by chlorising metallic silver; by acting on normal chloride with reducing agents; by partly reducing silver oxide or silver carbonate by heat and treating with H Cl; by forming suboxide or a subsalt of silver and treating with H Cl, followed by nitric acid; by acting on subchloride with nitric acid or an alkaline hypochlorite, &c.; by attacking almost any soluble salt of silver with ferrous, manganous, or chromous oxide, &c., followed by H Cl; by reducing silver citrate by hydrogen and treating it with H Cl; by treating a soluble silver salt or almost any silver solution with potash or soda, and almost any reducing agent, cane sugar, milk sugar, glucose, dextrine, aldehyde, alcohol, &c., and supersaturating with H Cl; there is no organic easily oxidisable substance that I have tried that has failed to give this reaction. Also almost any salt of silver exposed to light, treated with H Cl and then with hot strong nitric acid, yields it. Almost any of these classes represents a long range of reactions, each susceptible of endless variation. In fact, the more the matter is studied, the more extended the range of reactions is found to be that give rise to the formation of this substance. To show how slight an influence will lead to the production of red chloride instead of white; if freshly precipitated argentic oxide is mixed for a few moments with starch or tragacanth paste, and is then treated with H Cl, the result is, not white, but pink, silver chloride. Even raw starch flour mixed with silver oxide will, in a few moments, cause it to give a pale flesh coloured chloride with H Cl. Boiled starch or tragacanth paste does this more quickly and acts more strongly, even in the cold, and still more if heat is applied.

Although red is probably the most characteristic colour of this substance, so that I have spoken of it above as red chloride, nevertheless this hardly seems a proper name for a substance that is often purple, chocolate, or black, sometimes brown or even ochreous, sometimes lavender or bluish, and is probably capable of assuming every colour of the spectrum. To call it argento-argentic chloride would infer a stoichiometrical composition that, as already mentioned, seems very uncertain, too much so to serve as the basis of the name. Therefore, and as these substances have been hitherto seen only in the impure form in which they are produced by the continued action of light on the normal salts, it might be convenient to call them photosalts, photochloride, photobromide, and photoiodide instead of red or coloured chloride, &c., and thus to avoid the inexactness of applying the term red chloride to a substance exhibiting many other colours.

Photochloride by Action of Alkaline Hypochlorites.—Black or purple-black chloride is easily obtained by the action of an alkaline hypochlorite on finely divided silver, such as obtained by reduction in the wet way. Commercial sodium hypochlorite may be used to act on it. It is to be poured over the silver, and after standing a few minutes, is to be replaced with fresh. After an hour or two this is again to be replaced with a new portion, which is to be allowed to act half an hour to insure the total conversion of the silver. The product varies somewhat in colour, is sometimes black, oftener purple-black. If the treatment with hypo-

* Silver chloride may be dissolved out by hot solutions of sodium or ammonium chloride, but the subchloride is at the same time decomposed. See beyond under head of "Reactions."

chlorite has been thorough, strong cold nitric acid of 1.36 s.g. extracts from it no silver. This reaction with nitric acid is important, as it shows that not only metallic silver was not present, but that the product contained absolutely no uncombined subchloride. For if any were present it would instantly be decomposed by the acid, in which one-half of its silver would dissolve. The action, therefore, appears to take place in this way. First subchloride is formed, part of this is further chlorised into normal chloride which at once combines with other subchloride, thus taking it out of the further immediate action of the hypochlorite, and this goes on until an equilibrium is reached, and neither metallic silver nor uncombined subchloride is left, as is proved by the action of nitric acid. Alkaline hypochlorite, as will presently be shown, attacks uncombined subchloride very rapidly, the combined very slowly; by many days' contact the quantity of combined subchloride is gradually reduced.

Prolonged treatment with hot strong nitric acid destroys all the varieties of photochloride. The time needed varies a good deal. A specimen of that obtained with hypochlorite required twenty-five hours' heating with acid of 1.36 in a water bath at 212° Fahr. to bring it to the condition of white normal chloride. Considering that cold dilute nitric acid instantly destroys freshly precipitated argentous chloride in the free state, this long resistance to strong acid at the temperature of boiling water must be considered most remarkable.

When the red or photochloride is formed with the aid of a ferrous salt or ferrous oxide, I prefer to boil the product with dilute H Cl to get rid of the last traces of iron, after a preliminary treatment with hot dilute nitric acid has removed silver and uncombined subchloride. The photochloride will sometimes even resist boiling aqua regia for a time.

Protected from light, photochloride is perfectly stable. Specimens obtained eighteen months ago appear to be quite unchanged.

When treated with ammonia, it is far more slowly attacked than the normal. The ammonia dissolves the normal chloride only. The union between the two must therefore be broken up, and this takes place slowly. The first action of the ammonia is to change the red or purple colour to greenish black and then to slowly dissolve out silver chloride. Hours are required even with a large excess of ammonia. Whilst this is going on, if the ammonia is poured off and replaced with nitric acid, the original colour reappears. If the action is continued sufficiently long, silver only remains and dissolves readily in nitric acid. A little short of this, treatment with nitric acid leaves a black residue of dark chloride mixed with metallic silver. The dark chloride being insoluble in any acid, has led to some strange mistakes in a similar reaction which occurs in treating with ammonia silver chloride that has been exposed to the light. Even a theory has been had recourse to of a "passive condition" of silver. This passive silver is simply black chloride.

A specimen of purple-black chloride was treated with warm strong aqua regia until whitened by conversion of the subchloride to normal. By this treatment 2.563 grammes of photochloride gained nine milligrammes, indicating the presence of two and a half per cent. of subchloride, or more exactly

Subchloride	2.49
Normal chloride	97.51

This is not to be taken in any sense as representing a constant composition. The proportion of subchloride varies between certain limits, not only according to the method of preparation used but independently of it. Another specimen of black chloride formed with hypochlorite gave figures that indicated a content of less than half of one per cent. of subchloride.

Photochloride by Reduction of Normal Chloride.—This is an excellent means of obtaining red chloride. The white chloride is to be dissolved in ammonia and ferrous sulphate added, producing an intensely black precipitate. After standing a minute, the mixture is to be treated with dilute sulphuric acid until it shows a strong acid reaction.

The precipitate is to be first well washed by decantation, then boiled first with dilute nitric, then after washing with dilute hydrochloric acid, which must, of course, be thoroughly washed out.

The product obtained in this way is often of singular beauty. It might easily be taken for metallic copper. Sometimes it is as rich and bright in colour as the copper obtained by electric deposition. Every one knows the richness and brilliancy of that form of copper, and I have seen it fully equalled by this silver salt.

The beauty of the colour depends always on the thorough removal of any metallic silver that may be present, and still more on getting rid of every trace of iron. The boiling with dilute hydrochloric acid should be continued until, after thorough washing, a fresh treatment extracts no more and the acid remains colourless in presence of alkaline sulphocyanide.

Instead of an ammoniacal solution of silver chloride, we may make a solution of any other silver salt in ammonia and reduce it in the manner just described with ferrous sulphate. But in this case hydrochloric acid must be used instead of sulphuric after the reduction. This single reaction includes an almost endless variety of methods. The acid with which the silver was originally combined seems to be not without influence on the result; in some cases, for example, with arseniate and molybdate, the action of coloured light on the red chloride seems to be

somewhat modified. Silver phosphate on account of the ease with which it suffers reduction is very well adapted for this treatment.

Photochloride by Partial Reduction of Oxide by Heat, and Treatment with H Cl.—This method has the advantage of avoiding all admixture of foreign substances, the last traces of which are very hard to get rid of, and seem to exert an effect on the colour disproportionate to their quantity. Accordingly the photochloride obtained in this way is very beautiful, the shades are from pink to copper red, and a tint resembling burnt carmine.

Heat may be applied to the oxide in either of two ways, long continued heat at 212° Fahr., or near it; or the change may be effected by roasting.

When slow heat is to be applied care must be taken that the oxide does not carbonate itself, which it easily does superficially; this is an objection because the carbonate, under these circumstances, yields white chloride with which the other becomes mixed. The air of a drying oven heated by a gas burner is especially bad in this respect. I have seen a surface of oxide form a coat of yellow carbonate in a few hours in this way. (Most oxide that has been kept some time will effervesce briskly with an acid.) The method is uncertain, sometimes giving strongly coloured products and sometimes pale pink.

The oxide may be roasted in a shallow, flat-bottomed porcelain basin. With a very moderate heat it changes from brown to black. When this is thoroughly accomplished and before grey reduction sets in, the oxide is to be treated with H Cl. If this be done in the basin itself after cooling and without disturbing the position of the oxide, a curious variety of tints will be noticeable, depending upon slight differences in the heat affecting different portions.

M. CAREY LEA.

(To be continued.)

HOW TO PREPARE FOR GOING OUT WITH THE CAMERA.

WHERE to go with the camera, with a fair prospect of finding suitable subjects to photograph, is a question more often asked than answered. This is especially the case when the time is limited to an afternoon, or at most a day. Each year seems to curtail the number of places, the ever-extending operations of the builder destroying, bit by bit, the picturesque surroundings of this overgrown London. The season for camera outings is now coming on, and a reliable list of places to go to would be an unmistakable boon. I say reliable advisedly, for the extraordinary ideas some people have of the requirements of photographers are most misleading and disappointing. I have been told by an enthusiastic lover of nature, that such and such a place was simply magnificent, no fear of lack of subject, take plenty of plates and go and see for yourself. I've been confiding, and have been to see for myself, and I've taken plenty of plates; moreover, I've brought them home again unused.

There are, however, few places that something cannot be squeezed out of in the way of a picture, but when one expects to find a plethora and discovers barrenness it is not conducive to happiness, especially if the journey has been long. The question is, How can we get plenty of reliable information? I would suggest as one way out of the difficulty, that any landscape photographer or painter conversant with photography who is desirous of benefiting his brethren, should send in the names of localities within easy reach of London, with an accompanying description in plain language of the sort of subjects to be found in them, to the *Honorary Secretary of the Photographic Club, Anderton's Hotel, Fleet-street*, who, from such information, would be enabled to compile a useful and reliable directory for reference, not only for the members of the Club but for any friends who may honour the Club as visitors.

If access was obtainable to a carefully written list of places with a terse description of the material there to be found, one could decide at once if such a locality would meet his requirements, and be prepared for the kind of work that lay before him, and select the sort of plates that would be best adapted for it. If those interested in the matter would fill up a form similar to this sketched below and forward it, it would be a great step towards such a desirable consummation.

Place or Locality.	Description.	Means of Access.	Nearest Railway Station.	Hotel.	Other Information.

With regard to the "description," it should be remarked if it is architectural or landscape. If architectural, whether cottages, old buildings, ruins, or ecclesiastical structures. If landscape, whether water, trees, open landscape, or studies. "Other information" would include the distance apart of interesting bits and the amount of walking or riding that would be necessary, and the facility with which vehicles can be procured. General information of this sort is invaluable to those who go to such places for the first time, and would add vastly to the comfort of those who go on a photographic outing of limited duration. The chief point is to

have such information perfectly reliable; and to be so, the giver must be thoroughly acquainted with the requirements of photography. It must not be for a moment imagined that the information is expected to fix on what a man is to photograph or pass by (for every photographer worthy the name will select his views according to his own ideas, and not servilely imitate another), but merely indicate such places where, to the informant's ideas, picturesque subjects are to be found.

EDWARD DUNMORE.

IMPORTANT INVESTIGATIONS IN THE SALTS OF SILVER.

As will be seen from a leading article, and also from the first portion of a communication from Mr. M. Carey Lea, which will be found in another column, this gentleman has entered upon a most important field of investigation. A concise synopsis of his discoveries is given in the last number of *Nature*, as follows:—

"In the May number of the *American Journal of Science* will be found a paper by Mr. Carey Lea, of Philadelphia, in which are described a remarkable series of salts of silver, which the author is attempting to make use of in obtaining photographs of objects in their natural colours. It is first shown, by an exhaustive series of experiments, that when light acts upon ordinary silver chloride, Ag Cl, in presence of hydrochloric acid, the darkening is due to the formation of a small quantity of subchloride, Ag₂ Cl, which enters into combination with the unaltered silver chloride to form a reddish compound of a nature similar to that of a 'lake.' This red chloride of silver is termed photochloride, and is found to be, unlike subchloride, unattacked by cold strong nitric acid. After a certain amount of this substance is formed, the action of light appears to cease—a phenomenon which has been frequently noted by other observers. Successful efforts were then made to prepare photochlorides, bromides, and iodides of this nature, and a full description of the very numerous methods and analyses is given in the memoir. The startling fact was discovered that all varieties of tints from one end of the spectrum to the other could be obtained under suitable conditions. Normally, the photochloride of silver is red, even one-half per cent. giving to ordinary silver chloride a strong colouration; but on exposure to diffused sunlight it quickly changes to purple. On addition of mercuric silver chloride it becomes grey, potassium bromide changes it to a permanent lilac, potassium iodide to a bluish tint, while a mixture of potassium chlorate and hydrochloric acid causes it to pass through pink and flesh colour to white. Heat, on the contrary, causes it to retake its red colouration, and on exposure to various parts of the spectrum it affects lovely shades of the most varied hues. The important observation was made that, in presence of small quantities of lead or zinc chloride, white light (which darkens the pure photochloride) bleaches it, thus producing white in those portions of the image which ought to be white; and it was also found that the addition of a little sodium salicylate enhances the sensitiveness threefold. The experiments are being continued, and appear likely to lead to important results in chromo-photography."

WHITENING GELATINE FERROTYPES WITH BICHLORIDE OF MERCURY.

THE effects of applying a bichloride of mercury solution to photographic silver deposits are well known to all practical photographers, as mercuric chloride has in various forms and for various purposes for a long time been employed in photographic laboratories. With it we have made "magic" photographs, have bleached out prints for engraving purposes, have reduced negatives, chlorinated the deposit previous to redevelopment, and have given to collodion positives those beautiful whites, in the more developed parts, which were so greatly admired by the public.

The long-wished-for solution of the problem of making gelatine positive or ferrotype plates had hardly been accomplished, when we find one of Germany's renowned emulsionists proposing improvements on the rather unsatisfactory tones of the pictures, made upon them, by whitening the deposit with a solution of mercury. Gelatine ferrotypes seem to have become very popular in Germany, and with the demand for them naturally arose the desire to improve their appearance. Dr. Schleussner tells us that this may be done with a weak solution of the bichloride of mercury. The method of working is similar to other operations of this kind; in fact, there is nothing to be done to the plate, except to leave it in the solution until the picture assumes the desired white appearance.

The peculiar bleaching effect of bichloride of mercury upon a collodion positive was first observed by Scott Archer, and dates back as far as 1850, at which time these pictures were first introduced in Great Britain, and before any attempts with collodion had been made in America. He recommended the use of a saturated solution of the bichloride in hydrochloric acid, one part of the solution being diluted with six parts of water. After the picture was fixed and well washed, this solution was applied. The positive image was first darkened, but it speedily began to whiten, and a delicate, beautiful, white picture was brought out. The method described by Archer may be applied to gelatine ferrotypes, although it is advisable to reduce the strength of the solution considerably, using, perhaps, instead of six parts of water, suggested by Archer, as much as twelve parts. As one of the first conditions for a good gelatine ferrotype plate is an extremely thin film of an emulsion, rich in silver, with a

strongly adhesive gelatine, the reaction takes place quickly and is completed with a solution in the proportion 1:100 in about two minutes. Before the mercurial solution is applied, the plate must be perfectly freed from hyposulphite of soda, an operation which, on account of the thin film, requires also but little time.

The fine appearance of the pictures, the absence of difficulties when making them, the rapidity of exposure, all warrant a general adoption of the process in a certain photographic sphere, and there is nothing seriously to be considered doubtful except their permanency.

Since we have become familiar with the working of gelatine films, the application of mercurial salts has been more or less condemned, justly, perhaps, in some cases, but in others without the least reasonable foundation. Negatives intensified with the salts of mercury have stood a test of several years; why may not a whitened positive, if properly made, be equally permanent?

When mercuric chloride is brought into contact with metallic silver, the latter is converted into chloride at the sacrifice of some chlorine of the mercuric salt, reducing it to mercurous chloride (calomel), making, in all probability, the substance of the white film a mixture of the two chlorides.

Silver chloride, as we all know, is sensitive to light, and so is calomel, especially when exposed in an elevated temperature under the influence of a moist atmosphere. Hence we must infer that the white deposit cannot be permanent, and that it is liable to change colour in a very short time. In the case of "alabastrine" collodion positives, it was not always found to do so; glass positives whitened with mercury, made thirty years ago, have retained their whiteness to the present day as well as a Daguerrotypes; while others again, and a greater number, have changed.

To explain these singular facts we must consider the mode of preparing the solution of mercuric chloride. Many operators were, in the early days, in the habit of using instead of hydrochloric acid as a solvent for the mercuric salt a solution of chloride of ammonium, by which stability of the whitened deposit was established. If, in course of the operation, ammonia was set free, which was by no means unlikely, mercurio-ammonium-chloride, or white precipitate would necessarily result. This precipitate is almost perfectly white; it is much whiter than calomel, which is rather of a yellowish tint, is not affected by light to any marked degree, and will stand rather a high temperature before it decomposes.

The permanency of photographic pictures can be judged of only after a lapse of time, and a mercurialised gelatine positive, with all its original brilliant whiteness, must be subjected to the same test with all other photographs. Whether a ferrotype possesses the same merits and has the same value as a silver print, or whether permanency is for these a *conditio sine qua non*, or otherwise, we will not attempt to decide. Mercuric chloride gives beautiful effects to gelatine ferrotypes, and, if carefully made, these ferrotypes will retain their beauty for a reasonable time. Let us not decry their beauties because there is a doubt of their permanence, but enjoy them rather while they remain.

—Photographic Times.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

Nos. 7372 and 7374.—"Improvements in the Manufacture or Production of Blocks or Plates for Printing from." C. KILG and L. COLLARDON.—Dated May 20, 1887.

No. 7390.—"Improvements in Magic Lanterns and Apparatus connected therewith." A. SCHAUSCHIEFF.—Dated May 20, 1887.

No. 7464.—"A Phantom Photographic Camera which Dispenses with the Necessity of Using a Base Board for the Support of the Front Board and other Parts of a Camera." T. PRESCOTT.—Dated May 23, 1887.

PATENTS COMPLETED.

IMPROVEMENTS IN CHANGING BOXES FOR PHOTOGRAPHIC CAMERAS.

No. 8329. ARTHUR SAMUEL NEWMAN, 87, Evershot-road, Finsbury Park, Middlesex.—June 24, 1886.

This invention has for its object to provide a means whereby the plates or "films" used in a camera can be readily changed without having to close or remove the changing box, and is more simple and effective than changing boxes as hitherto constructed.

For this purpose I construct the changing box, holding any suitable number of plates, with two slits or apertures at the top of the box, one at the back and the other at the front. Over these slits a hood or covering is mounted of sufficient size to freely contain a plate, this hood or covering being formed of any flexible light-tight material (or it may be a bellows), and is securely fixed on the box.

The plates or "films" are arranged in the box all facing the front, and in order to remove a plate on which a photograph has been taken and bring another plate into focus without removing the changing box or closing the shutter thereof, a cranked lever is provided (one end of which is outside of the box), and the other end connected to a wire or rod reaching across the box, and caused to travel (by the operator moving the lever) in a parallel direction near the front of the box, exactly in the place where the front plate is situated, and, rising beneath it, causes the plate to be raised into the dark hood or covering, and enables the operator to grasp it, and draw it quite out, and insert it again through the back slit or aperture behind the other plates (a spring mounted

upon the back of the box keeps all the plates pressed forward), a fresh plate being thus presented ready for use and in exactly the same focus, the film of each succeeding plate being in the identical position occupied by the last previous one.

In order to effect this object, I mount the plates in metal carriers, which hold them partly along the foot and each side at the top, where the metal carrier is turned over or appears in front; corresponding grooves or recesses are provided in the inside of the front of the box, so that the front plate or "film" will always become the bearing surface, which will lie against a bearing specially provided in the box, which latter bearing is recessed or hollowed out behind so as to allow for the edge of the metal carrier where different thicknesses of plates or "films" are used.

Instead of the cranked lever and rod before referred to, other means can be adapted for raising the plate in the first instance, such as by means of rack-work, an endless band, a lever and screw, or other suitable means.

The whole apparatus forms a changing box of the same sized sectional area as the camera to which it is fitted.

This changing box will also work equally well on its side.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
May 31	Bolton Club	The Studio, Chancery-lane, Bolton.
June 1	Edinburgh Photo. Society	Hall, 20, George-street, Edinburgh.
" 1	North Staffordshire	Mechanics' Institute, Hanley.
" 1	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 2	Leeds	Philosophical Hall, Leeds.
" 2	London and Provincial	Mason's Hall, Basinghall-street.
" 3	Yorkshire College	
" 3	Halifax Photographic Society...	M. Manley's, Barum Top.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. William England, Vice-President, occupied the chair.

Mr. T. SAMUELS exhibited a small camera with twelve plates which could be changed by means of a little closed bag at the back, which bag the hands of the operator did not enter; the plates were four and a quarter inches square and placed in metal sheaths. He also exhibited a half-plate camera made on the same principle, with improvements; likewise a quarter-plate camera. The cameras had no rising or falling fronts.

Mr. FRIESE GREENE suggested that the addition of an indicator, to denote the number of plates exposed, would be useful.

Mr. T. SEBASTIAN DAVIS said that there was a somewhat similar camera in the market in which the view could be seen at the time of making an exposure, and that was an advantage.

The CHAIRMAN remarked that it was a camera which could be used in a street without attracting public attention.

Sir D. SALOMONS, Bart., said that for most distances small lenses gave nearly all the view in focus, but that if some objects were exceptionally near the lens the proper adjustment could easily be made by means of a simple calculation.

Mr. F. W. EDWARDS then gave a demonstration of the platinum process, similar to one recently described in these pages.

Mr. DAVIS said that at exhibitions platinumotype and silver prints were found to advantageously set off each other when placed side by side.

The CHAIRMAN exhibited some platinumotype prints of excellent quality, portraits included, upon reputed silk, taken by his son Louis.

Mr. Mendelssohn said that it was actually a fine cambric, resembling silk, and that Chinese silk would be the best for the process.

The proceedings then closed.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, May 19, at a meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. H. M. Smith presided.

Mr. Herbert Starnes exhibited a tin holder for use when developing collodion-bromide lantern slides to avoid soiling the fingers; it was a kind of little shovel with corners turned up to prevent the plate slipping off.

The HON. SECRETARY produced some of his results in the taking of paper negatives; he felt sure that paper negative processes would make headway, because of the saving of weight in the field; the only drawback was the necessity for making the negatives translucent by oiling or otherwise.

The CHAIRMAN thought that persons with roller slides would be tempted to go in for quantity rather than quality.

Mr. W. M. ASHMAN said that paper negatives offered great facilities for development. When Mr. Bolas returned from Rome with a long strip of negatives he induced Mr. Cobb to walk off with one end of the strip and pull it across the room as the paper came out of the developing dish, and after pulling the strip thus three times through the developer the string of pictures was finished so far as development was concerned.

Mr. F. W. COX asked if the results were not flatter with paper negatives than with the best results upon glass. He had never seen a paper negative which gave good stereoscopic effect in a resulting print.

Mr. ASHMAN read a letter from Mr. Spurge apologising for absence from a recent meeting; he had obtained an appointment as chemical assistant to Mr. Campbell Brown, of University College, Liverpool, and on the night of the meeting had been engaged until a late hour with Mr. Van der Weyde over electric lighting matters.

Mr. W. E. DEBENHAM called attention to newspaper reports that Mr. W. K. Burton had stated publicly in New York that English photographers were less willing to impart information than those in America; he did not believe that Mr. Burton ever said anything of the kind.

Mr. W. H. HARRISON said that there was a paragraph in Mr. Burton's latest book expressing an altogether different opinion to that attributed to him in New York.

Mr. C. HEINRICH TRINKS read an extract from an article by Mr. Burton in the New York *Photographic Times* expressing opinions at variance with those attributed to him in the reports under notice.

The CHAIRMAN thought that Mr. Beach had made some mistake when reporting Mr. Burton's utterances.

Mr. ASHMAN did not believe that Mr. Burton had said anything of the kind attributed to him.

Mr. H. MOUL asked what was the best class of negative for collotype work.

Mr. DEBENHAM replied that the one which would give the best silver print would do best for collotype work.

Mr. A. L. HENDERSON had received a circular from the printers to the Newcastle Exhibition saying that the exhibits there were to be illustrated by a photo-mechanical process; they had enclosed him a very good specimen of such work. Had any one seen Mr. Hyslop's photographs of the performance at the Criterion Theatre?

Mr. TRINKS had seen them; some of them he considered to be very good indeed, the others were a little blurred.

Mr. MOUL remarked that the said Criterion photographs had been done by Mr. Roberts upon Cadett's plates.

Mr. ASHMAN said that Mr. Hyslop had photographed the performances at the St. James's Theatre.

The CHAIRMAN asked if any one had tried to photograph the Queen during her drive through the City; he had tried in Cheapside, but he failed because she went by at such high speed. He photographed the crowd all right, also pieces of paper blowing about in the air as the procession swept past.

Mr. A. COWAN said that it was the business of a procession to process.

Mr. HENDERSON had on the same day tried to photograph her at Mile End, but she drove past at the rate, he estimated, of nine miles an hour. He used a lens made by Suter.

Mr. COWAN thought that the lens did not suit her.

The Association resolved to hold an outdoor meeting on Whit Monday, May 30, at Chiddingstone, near Penhurst, Kent, for which a train by the South Eastern Railway leaves London Bridge at thirty-five minutes past nine a.m.

The meeting then broke up.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held on Tuesday, the 17th instant, at Myddelton Hall, Islington, N., Mr. J. Traill Taylor, President, in the chair, Messrs. C. Cusworth, J. G. Hilton, and E. Purton, were elected members of the Society.

Mr. COPPIN exhibited and explained the working of his patent "one back," which was examined with interest.

Mr. C. Cusworth showed a half-plate camera of his own construction.

Mr. A. Mackie exhibited some transparencies on plates coated with the collodion emulsion he had made at the lecture at the previous meeting.

Mr. W. H. WALKER (of the Eastman Company) delivered a lecture explanatory of the principles and working of the Eastman-Walker stripping film. In course of this he described a discovery that had been made by which the expansion of paper when wet was in a large measure obviated. He also described the various operations incident to the manufacture of the films. He was ably aided by Mr. John Jackson, who very skillfully demonstrated the process from the development of a negative to the final stripping, specimens of the work at various stages being handed round.

In reply to Mr. L. Medland, Mr. WALKER said that the films registered 22 by Warnerke's sensitometer.

The thanks of the meeting were voted to Messrs. Walker and Jackson.

Excursions were arranged for Saturday, May 28, to Richmond, and for Whit Monday, May 30, to Chiddingstone. (London Bridge Station, thirty-five minutes past nine train. Book to Penhurst.)

Next meeting, on Tuesday, June 7, will be a technical meeting. Visitors are invited.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting of this Society was held at the Greyhound Hotel on May 11.—Mr. Crosthwaite in the chair.

Some fine platinum pictures by Mr. Payne Jennings were passed round and elicited admiration, the artistic merit of these productions being of the highest standard.

After the usual business an exhibition of lantern slides was made, several members contributing specimens of their work. Mr. Smith, of Great Portland-street, brought a fine selection of slides made by the Woodbury process. Some exquisite collodion transparencies kindly lent by Mr. Gale were also exhibited.

Mr. SMITH explained the principles and working of a special camera designed by him for the production of lantern pictures.

The usual votes of thanks brought the proceedings to a close.

BURY PHOTOGRAPHIC AND ARTS CLUB.

THE ordinary monthly meeting of the above Club was held on Wednesday evening, May 18, in the Temperance Hall, Henry-street, Bury.—The President (Mr. F. W. Livsey) in the chair.

The minutes of the previous meeting having been read, were confirmed.

A discussion then arose as to where the places for the outdoor meetings for the ensuing year should be held. It was finally decided that the Council should choose the localities from the following places named by the members at this meeting:—namely, Kirkstall Abbey, Fountains Abbey, Harrogate, Craigs, Tabley Park, Speke Hall, Lyme Hall, and Malham.

The Secretary (Mr. C. H. Openshaw) then produced a pneumatic drop shutter, designed by himself and Mr. H. M. Bearden, and made by Mr. S. Hepworth, also some photographs of trains exposed by the same, which were much admired, there being not the slightest sign of movement, though the trains were going at full speed. The shutter itself was also much admired both for the simplicity and speed with which it worked.

THE PRESIDENT then produced a photograph (silver print) of Nuttall Hall, near Ramshot, the residence of J. G. Lawson, Esq., which had nearly faded out. He said the photograph had been thoroughly washed and mounted with a reliable mountant; it had also been kept in a dry place. He invited the members to open a discussion as to the cause of the fading, which ended in the general opinion being that the mount on which the photograph had been placed contained some impurity.

The meeting then terminated.

PHOTOGRAPHIC SOCIETY OF IRELAND.

OWING to an oversight in the report of the meeting of the above Society which appeared last week, mention was omitted of a camera and new pattern stand which was exhibited by Mr. J. V. Robinson.

The camera is similar to his well-known patent camera, but has an addition of a strut or arm from baseboard to back of camera, this arm being so constructed as to allow of double swing while at the same time rendering the camera perfectly rigid. Considerable interest was shown in the examination of this contrivance.

The camera stand is a folding or portable pattern, consisting of three joints, the lower a folding and the middle a sliding joint. The point of novelty is the method of clamping this middle or sliding joint by a hinged wedge, which is very quickly brought into action or released. It appeared to be the opinion of the meeting that this is a good and effective construction of camera stand.

Correspondence.

COLOURED PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—Like other advances towards a great discovery, the "new departure in coloured photography" lately made by Mr. J. E. Mayall, of 164, New Bond-street, has given a new impulse to the question of "Photography in natural colours." His discovery, whatever its nature, if based on chemical action, is great, because it would be the first successful attempt, so far as we know, at producing chemically a photograph in various colours. The new process of Mr. Mayall, then, bids well to be popular, and we heartily wish him a profitable as well as a scientific success.

Without pretending to understand the nature of Mr. Mayall's discovery, we do not think he gives it out as the looked-for process of photography in natural colours, but we think that if the progress of photography keeps pace with the advance it has made within the last twenty years, the time is not far distant when some such discovery may be made.

Hitherto, we may say we have been working in the *dark*, since the productions of photography are made with *shades*; at no remote date, probably, we may be speaking of lights and colours instead of lights and shades.

At this rudimentary stage of our knowledge on the subject, however, it may not be out of place to indulge in some hypothetical remarks as to the probable nature of a process likely to fulfil our expectations of the eagerly looked-for discovery, in as much as conjectures are the preliminaries of all theories which are to be proved by practice or acquired by empirical researches, and as such conjectures, corrected by vying critics and additional opinions, eventually ripen into the desired result, however indirectly it may come.

It appears to us, therefore, that the ultimate success of photography in natural colours shall consist in the production of a negative in colours complementary to those of the object represented, the natural colours of which shall be reproduced on the print or positive; as, for example, a blue eye would appear on the negative of an orange colour, the carnations would appear green, yellow would appear purple, &c. To give a practical example of this idea: if we take a piece of red glass and look through it at a red-brown colour, the latter will appear of a drab or greyish drab colour, that is, of such a colour as, if mixed up with the same colour as that of the glass, would reproduce the actual brown colour under observation. In fact, the red colour of the glass thus appears subtracted from the sum of colours composing the brown, and, in like manner, each tint of the coloured negative would subtract its own colour from white light, or, to use the expression of physicists, would absorb the rays of its own colour and intercept them, but transmit the rays complementary to it.

Until the nature of the impressed photographic image before development be better understood, it will probably be difficult to arrive at a practical solution of the problem. In our opinion, the agency by which the invisible image is produced is not chemical in its nature; the rival theory, that it is due to a disturbance of the molecules of the iodide of silver, is probably not more correct. Our own idea, which we think is a new one on that subject, is that a peculiar physical disturbance, which we may call vibration, is produced in the waves of light under the existing favourable circumstances, by some complex phenomena taking place in the sudden transmission of the rays of light through several suitable media, which are the air, the sensitive film, and the plate; during which course the rays undergo several refractions and reflections, which disturb the relation of the waves of light under circumstances favourable to the development of actinic force, which receives an uneven distribution over the plate, determined by the reflection of the

rays of light from the object or image to be represented. Actinic force would then be produced in a manner analogous to what takes place in the mechanical development of electricity in amber by friction or by the mere contact of two plates of different metals. The actinic force would then be in a state of tension or inhibition, in the manner of stored-up electricity, ready to develop chemical action under favourable circumstances, as electricity would do. In fact, actinism is a force similar to electricity and both are no doubt interconvertible, such also as heat, motion, and other forces. Moreover, invisible images have been produced by electricity, and further investigation will probably reveal that they may be produced likewise by the agency of other forces, such as heat, friction, magnetism, &c.

It is difficult to predict which, of the spectroscopy or of the discovery of some reagent, will play the most important part in the process, but there is here a wide field open to experimenters in the various applications of the spectroscopy during the production of the invisible image and also during the after development.

There exist also chemicals which, under the influence of some reagents, undergo a very remarkable change in colour; and some go through a succession of colours which, no doubt, in a more advanced stage of our knowledge, shall be taken advantage of in photography in natural colours. The following is an example of such change: If a small piece of strychnia is dissolved in a drop of strong sulphuric acid on a piece of white porcelain or of glass, and close to it a little finely powdered dioxide (black oxide) of manganese is mixed with a similar quantity of sulphuric acid, then the two brought together, a beautiful play of colours takes place—first a rich purple-blue appears, which gradually changes into crimson and then into reddish pink. The same effect may be produced if bichromate, or permanganate, or ferricyanide of potassium are used instead of the dioxide of manganese. The same result can be obtained also if, instead of the latter reagents, peroxide of lead is used dissolved in strong sulphuric acid mixed with one-fourth of its bulk of strong nitric acid.

In closing this letter, we wish to mention that we have not the least idea of having pointed out the means of arriving at a solution of the intricate problem in question; but our intention is merely to bring our opinion into contact with that of others, in order to improve our knowledge by mutual criticism, which is the rectifying process of all embryonic theories.

The experience of different men, and likewise their knowledge of any art, vary from the different points of view which every individual takes of it. One acquires more experience in the practical part, another in the scientific or theoretical, and each of these in different directions. The union of all such individual experience constitutes the greatest possible knowledge.—We are, yours, &c.,

OEFFELEIN & Co.

54, Berners-street, Oxford-street, London, May 23, 1887.

[Our correspondents do not appear to perfectly realise what the nature of Mr. Mayall's "invention" really is. It has nothing whatever to do with the obtaining of photographs in natural colours in the camera, but with a method of applying colours to photographic prints by which they will have a more natural appearance than if they were allowed to remain uncoloured. The only question between the Mayall method of colouring and any others, such as the crystoleum, of which we have published the details, direct and modified, times innumerable, will be which is likely to produce the best effect, and on which side will the balance preponderate. Mr. Mayall or his friends claim that by his method the colours can be applied in a couple of minutes or so; but this may be an error, seeing that a portrait, for which we sat on the 17th instant, has not yet been completed up to the time of our going to press.—EDS.]

PHOTO-MICROGRAPHY.

To the EDITORS.

GENTLEMEN,—As I am the Fellow of the Royal Microscopical Society alluded to in your last number as having exhibited photo-micrographs which had been obtained by means of a sliding diaphragm, perhaps you will kindly allow me sufficient space to explain more in detail the means by which I obtained them. After three years' experiments in various directions in endeavouring to get satisfactory photographs, I at last came to the conclusion that with the objectives I commonly use, varying from one-and-a-half inch to one-eighth, I got a great deal more light from my paraffine lamp than I could possibly need. Stops in the objectives, besides being contrary to the principles and intentions of the accomplished opticians who made them, introduced so many errors by their proper performance being interfered with that I gave that up; but still I had the difficulty of too much light, the details of my preparations being drowned in the flood of it. I therefore got over this difficulty by adding to the back of my object carrier a tube having a slot in one side and a sliding diaphragm, which I could thus move backwards or forwards till I could bring out and focus the details of my subject, limiting the amount of the light by taking only so much of the cone of rays sufficient for this purpose. Since then my results have been more satisfactory in every way, while the just performance of the objectives was left intact.

I firmly believe the knowledge of this method of operating will be of advantage to those who have recently taken up this most interesting branch of photography.—I am, yours, &c.,

T. CHARTERS WHITE.

32, Belgrave-road, S.W., May 25, 1887.

AN ANSWER TO "FREE LANCE."

To the EDITORS.

GENTLEMEN,—Your errant correspondent "Free Lance" wants to know what I mean when I say that "sodic sulphite requires careful neutralisation with acid." Well, as usual, I mean what I say—namely, that sodic sulphite, when used as a pyro preservative, requires careful neutralisation with acid. I am not aware that I mentioned or alluded to the action of the soda salt as affecting the development of the plate. If "Free Lance" thinks that the acid is not required, let him add four ounces of sodic sulphite in solution to an ounce of pyro, without the acid, and then let him tell us how the sulphite works as a "preserver" of pyro.

I have to-day added one hundred and sixty grains of sulphite in solution to forty grains of pyro without neutralising the former, and the mixture is already darker in colour than it ought to be after six months. My sulphite is of the best quality, as I believe; it cost the top price and came from a good house.

I never had the pleasure of meeting the late Colonel Russell, whose death you mentioned in your last issue, but his name has long been known to me as one of the most honoured in photography, and I hope it may not be taken for presumption on my part that I venture to express my sincere regret for the death of such a man. His modesty seems to have been as great as his ability.—I am, yours, &c.,

Craigeleugh, Langholm, N.B., May 21, 1887.

ANDREW PRINGLE.

THE RIGHT TO THE NEGATIVE.

To the EDITORS.

GENTLEMEN,—The writers on this subject in your JOURNAL have not confined themselves to the question, "To whom does the portrait negative belong?" What reasons can photographers advance to justify their claim to the ownership of it? No writer yet has advanced one reason to justify that claim. Custom, when questioned, is no reason.

I am sorry to read that Mr. Basbe, of Sheffield, has, after twenty-five years' experience, to confess that he can rarely secure a really good negative a second time. His inability to do this is certainly a fairly good reason for his opposition to the destruction of his good negatives when secured, but is no reason that these negatives should be claimed by him as his. To claim the cake and the halfpenny is morally bad.

Mr. Basbe writes, "I do not use argument—it is not necessary." Permit me to add, it is so unpleasant.

Mr. Basbe seems to have overlooked, when writing, that he was addressing himself to photographers, and not to the general public.

Photographers do, as a rule, know how to conduct their own business, and, as a rule, they endeavour to please the public, from whom they receive their daily bread.

As a photographer since 1854, I again repeat that a photographer has no right to the ownership of a portrait negative, that he has not one reason to advance to justify his claim to it, and, more, that the destruction of the portrait ought to be imperative if requested by a client, and on an unwilling photographer should be enforced by law.

The destruction of the negative would be no loss to the photographer, but in the end would prove to be to him a monetary gain.—I am, yours, &c.,

Newcastle-upon-Tyne, May 23.

J. F.

To the EDITORS.

GENTLEMEN,—The question of the proprietorship of the portrait negative has been discussed at some length in your JOURNAL, but all your correspondents appear to have missed the point.

The glass and the film is no doubt the property of the photographer, the same as the camera lens and other appliances which enable him to produce the photograph, and custom has given him the right to keep it, but the impression on the film is undoubtedly the property of the sitter, not because he has paid for it, but because the photographer has no right to print and sell copies without his permission. The sitter has also the right to order the destruction of the impression on the film, and no respectable photographer would object to comply with this request, knowing that no more copies would be required after such a request had been made.—I am, yours, &c.,

Bath, May 23, 1887.

J. DUTTON.

To the EDITORS.

GENTLEMEN,—As my first letter to you on this important subject has called forth several expressions of opinion, it may be interesting to yourselves and to your readers to know how the contention has ended.

I am pleased to tell you that it is in a manner eminently satisfactory to the profession, as my customer has practically admitted the justice of my demand by sending a cheque to my Solicitor for the amount claimed by me as the price of the negatives, namely, one guinea each, with Is. 6d. for packing and postage.—I am, yours, &c.,

23, Union-street, Ryde, Isle of Wight.

ARTHUR DEBENHAM.

PHOTO-THERMOGRAPHY.

To the EDITORS.

GENTLEMEN,—In connection with the very interesting article on this subject in your issue of May 13, permit me to call your attention to the following:—"If a sheet of paper on which a key has been laid be exposed for some minutes to the sunshine and then instantaneously

viewed in the dark, the key being removed, a fading spectre of the key will be visible. Let this paper be put aside for many months where nothing can disturb it, and then in darkness be laid on a plate of hot metal, the spectre of the key will again reappear."

I, some time since, extracted the above from a work called Nature's Secrets, published by Houlston & Wright, 1863, intending, if time permitted, to verify the statement by experiment; but pressure of business has prevented. I, therefore, send it to you, thinking that some one may like to test the matter who has more leisure than—I am, yours, &c.,

J. MARTIN.

Printing and Enlarging Works, 4, Park-villas, New Southgate, N.

THEATRICAL PHOTOGRAPHS.

To the Editors.

GENTLEMEN,—In reply to Mr. Hyslop's letter in your last week's issue I regret that any remarks of mine should have been construed into a grievance against this Club. I have no grievance whatever against the Club and no wrongs to air. Without troubling you with categorical replies to his questions, I am quite willing to admit that the formula which he gave me at an early stage of my experiments was of material use to me, although the plates I finally used were not prepared by that formula.

What I intended to assert, and do assert still, is that the idea of photographing the theatrical scenes by means of orthochromatic plates was entertained by me and put in the way of being carried out long previous to my acquaintance with Mr. Hyslop, and also that my pictures were actually taken some weeks earlier than his. Thus I in no sense "followed his example." I am prepared to prove this to Mr. Hyslop's satisfaction if he thinks it necessary to dispute it, and to show him certain letters on the subject which are in my possession, but which I do not think it necessary to put into print.

With apologies for troubling you at such length—I am, yours, &c.,

JOHN F. ROBERTS.

Camera Club, 21, Bedford-street, W.C., May 25, 1887.

Exchange Column.

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

- Will exchange limelight jets and pair of five-inch double condensers in brass cell for single view lenses.—Address, C. ROWLAND, 39, Cecil-street, Carlisle.
Will exchange a Dallmeyer lens, 1 1/2 (long), and half-plate view lens, by Mayno, of Dublin, for good half-plate camera with double slides and stand.—Address, J. DAVIDSON, 79, George-street, Edinburgh.
Wanted, half-plate portable camera and lens, slides, and tripod, in exchange for whole-plate burnisher, three volumes of the JOURNAL (1884, 1885, and 1886), ten ALMANACS, and other things.—Address, M. GRANT, 419, Kingsland-road, E.
Will exchange 10x8 portable camera, with one single or one double dark slide, for half-plate or 7x5 camera, with three or more double slides, by good maker; also interior background, good condition, for another ditto.—Address, WHITEHOUSE, Dolgelly, North Wales.
Last six years' BRITISH JOURNAL OF PHOTOGRAPHY, half-plate repeating-back camera, half-plate portrait lens, half-plate view lens by Marion, strong tripod stand, copying camera, 11x9. Wanted, a 12x10 view lens and a whole-plate camera.—Address, W. B., 32, Stoke-road, Guildford.
Will exchange mahogany studio camera, eight inches square, with or without half-plate lens, also quarter-plate sliding-body camera, lens, and mahogany tripod, studio stand, and pair of single stereoscopic view lenses, for posing chair, balustrade, or other accessories for studio.—Address, W. HYETT, Photographer, Cheltenham.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

- J. White, Salford.—Photographic group of Prince and Princess of Wales at Peel Park, Salford.
J. Edge, Stretford-road, Manchester.—Photographic group of Prince and Princess of Wales at Peel Park, Salford.
Messrs. Pows & May, Birmingham.—Five portraits of Mademoiselle D'Alcourt.

- OXON.—There is no photographic directory published.
R. C.—The matter is very simple. Have no further dealings with the firm.
F. B. SYMES.—A microscopic objective for your purpose should be slightly under corrected.
O. B.—1. The person you name is a charlatan and the scheme a swindle.—2. It was in Chicago.
KATHERINE C.—There is no such agency. Your only plan will be to advertise in the foreign photographic journals.
W. C. H.—Bitumen suitable for the purpose may be obtained at any operative chemists or at most drysalers and dealers in varnishes and polishes.
G. B. ROBERTSON.—A five-inch head is quite large enough for the sheet of paper you employed, the assertion of your artist customer notwithstanding.
BOAZ.—The washing apparatus mentioned is very ingenious. If you have a simpler arrangement which answers the same purpose it is of course an improvement.
A. W. S.—1. So far as we are aware, such an apparatus has not been used before or been patented.—2. We think it would be quite worth while to patent your invention.

D. MCP.—A printing bath of a less strength than forty grains to the ounce should not be used for the ordinary run of negatives. For general purposes a stronger one is desirable.

Iso.—We never recommend any particular maker's plates. Orthochromatic plates will answer for general purposes as well as the ordinary ones. Consult our advertisement columns.

TOMPO.—Stop out all the figures not required in the copy with Chinese white, then wash it off when the negative is taken. The bath need not be moved during the time the paper is being floated.

C. L.—1. In keeping a stock solution of chloride of gold, it is better not to add anything at all to the water if the chloride be acid; if not, a drop or two of hydrochloric acid should be added.—2. The quantity of bromide added at a time will depend upon the extent of the over exposure. If the plate be very much over exposed the bromide may be used much more liberally than if only slightly so.—3. It is simply a question of actinism.

W. R. WILCOCKSON asks: "Will you kindly give me a formula for a reducer for over-developed negatives, not chloride of lime?"—One of the best methods of reducing over-dense negatives is to immerse them in a solution of hyposulphite of soda—one ounce to the pint of water—to which a few drops of a solution of the red prussiate of potash have been added. The actual strength of the solution is not very material, but the weaker it is the more of course it is under control.

PERPLEXED.—So far as we can judge, the spots do not arise from the paper but from something in the sensitising or drying. In the example sent the spots appear to be due to some minute particles of reducing matter coming in contact with the paper as it dries. Floating particles of pyrogallie acid in the atmosphere would produce a similar effect. We advise you to discard blotting-paper altogether, and, instead of drying by means of a Bunsen burner, dry the paper before the fire or allow it to dry spontaneously.

W. B. CASSINGHAM asks: "Is it necessary to thoroughly wash a negative before putting it into the alum bath from the hypo? I have seen some operators take the negative from the fixing bath, hold it under a rose jet for about thirty seconds, then place it into the alum. Is this washing sufficient, or does it require a thorough wash? By answering the above in your 'Answers to Correspondents' column you will greatly oblige."—The washing alluded to is far too short. When a negative contains hyposulphite and it is immersed in a solution of alum, a decomposition is set up with a liberation of sulphur and sulphurous acid, neither of which are likely to conduce to permanency.

W. H. STEWART writes: "I have a Daguerreotype to photograph, cabinet size; it is not spoilt, but is brighter in some parts than others, and rather hard to place in such a position as to get the positive view of the image. Could you please inform me how such a picture is to be photographed? I wish, if possible, to take it by the gelatino-bromide process."—If the Daguerreotype is not tarnished it becomes simply a matter of illumination. The picture should be arranged in the position before the camera in which it can be most distinctly seen; then all reflections must be stopped off and the light so arranged that it comes principally from one source. In arranging the Daguerreotype it should be placed so that the light falls in the contrary direction as the plate was polished. By this means the faint lines or minute scratches will be reduced to a minimum. It is impossible to give more definite instructions, as so much depends upon circumstances.

RECEIVED.—Amateurs' First Handbook. By J. H. T. Ellerbeck.

We are reluctantly compelled to hold over some Reviews, Notices, Articles, and Correspondence.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—Outdoor meeting on Monday, the 30th instant, at Chiddingstone. Train from London Bridge to Penhurst Station at thirty-five minutes past nine.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, June 1, 1887, will be Retouching and Double Printing. The Bank Holiday outing at Leatherhead, leaving by the forty-three minutes past ten train from Victoria, and the thirty-five minutes past ten train from London Bridge.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—Excursions.—May 23. To Richmond. Members will meet in the booking office at Richmond Station at fifteen minutes past three p.m.—May 30. To Chiddingstone. The train leaves London Bridge (South Eastern Railway) at thirty-five minutes past nine a.m. Book to Penhurst.

CAMERA CLUB.—Thursday, June 9, at nine p.m., Mr. T. M. Brownrigg will give an exhibition of lantern slides made from negatives taken during his recent travels on the Continent. The illustrations will include landscape, interiors, and statuary. The next Club excursions for members and friends are, on Saturday, June 4, to Brasted and Westerham; and on Saturday, June 25, to Marlow and neighbouring points upon the Thames.

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Table with two columns: PAGE and CONTENTS. Includes entries like VIONETTING FACILITIES, PHOTOCHLORIDE OF SILVER, PHOTOGRAPHING FLOWERS, PAPER NEGATIVES IN ORDINARY SLIDES, ACCESSORIES OF THE LANTERN, ON STEREOSCOPIC WORK, POLLIT, HALATIONS IN NEGATIVES, GEORGE DAWSON, M.A., Ph.D., THE RIVAL PHOTOGRAPHERS, REDMOND BARRETT, ODDS-AND-ENDS, BY ABEL HEY, WOOD, JUN., CONTINENTAL PHOTOGRAPHY, ON RED AND PURPLE CHLORIDE, BROMIDE, AND IODIDE OF SILVER; ON HELIOCHROMY, AND ON THE LATENT PHOTOGRAPHIC IMAGE, BY M. CAREY LEA, HOW TO PREPARE FOR GOING OUT WITH THE CAMERA, BY EDWARD DUNMORE, IMPORTANT INVESTIGATIONS IN THE SALTS OF SILVER, WHITENING OELATINE FENICOTYPES, BY WITCH CHLORIDE OF MERCURY, RECENT PATENTS, MEETINGS OF SOCIETIES, CORRESPONDENCE, ANSWERS TO CORRESPONDENTS.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1413. VOL. XXXIV.—JUNE 3, 1887.

HINTS ON THE USE OF COAL GAS.

WE are often surprised to note the slight extent to which the powers of coal gas are utilised in the work of the photographer, and the answers we have received to our inquiries as to the cause of this neglect to render available the capabilities of a most useful servant, have suggested the thought that a few hints on the matter may be of real service. Happily there are, nowadays, in the ranks of photographers many men who have nothing to learn as to the use of laboratory appliances, but they form only a minority among a large body of intelligent workers, comprising many who are possessed of taste and culture, but who have had little technical training of even an elementary description, and to such will our remarks be more particularly applicable.

The letters which periodically appear in the London dailies as to the rapacity, not to say chicanery, of the gas companies, and which a couple of years ago created, by their number and violence, quite a fever among gas consumers, attest the ignorance of the average Briton upon this most simple matter of taking the reading of a gas meter. And it is this ignorance as to how to ascertain the consumption of gas in a given time which gives point to the main objection we have heard alleged against the use of a gas burner for heating or boiling purposes. "They are so expensive," we are told; nothing the makers state as to the maximum consumption has any effect, and the statement is recklessly proffered that all burners "waste such a quantity of gas." As a matter of fact, there are many heating burners obtainable which would not burn threepennyworth of gas if they were employed for twelve hours at a time without cessation in their action. The reading of a meter is most simple. Usually, three faces like those of a watch are visible on the front of the meter, the figures running, unlike those of a watch, from 1 to 10, and also, it will be observed, counting alternately from right to left and left to right. Observing the figures the finger or pointer has last left, these figures are put down, one after another, that on the left face being first; then two ciphers are added. The next time the meter is "read" this process is again gone through. The first lot of figures subtracted from the last tells the actual number of feet used; the rest needs no explanation. It may be observed that no smaller quantities than hundreds of feet are thus given; but it will be quite easy to mentally divide the spaces between the figures on the last face into five parts, and so estimate the quantity down to twenties of feet.

Perhaps, however, the main objection we have heard proffered has, after all, been that gas burners for boiling produce such a disagreeable smelling and vitiated atmosphere that the establishment is best without them. To a certain extent

these objections are well founded, but to a certain extent only. Let us first of all point out to our readers that the ordinary thin rubber tubing fitted with helical wire lining that is usually employed should be entirely discarded, for it is quite pervious to coal gas, and as long as it is in use, and, indeed, for a long time afterwards, emits a most nauseous odour. The tube to be employed for connecting the portable burner to the gas pipes should at the least be of the "extra thick" rubber tube now so commonly sold; it allows very little gas to pass through, even when continuously employed. There is, however, a kind of tube made and sold by Mr. Fletcher which is absolutely impervious to gas, and wherever the smell of gas is a great drawback it should be employed; it can only be obtained in short lengths, but where required these may be joined by pieces of glass tubing. There is, however, a little thought of source of escape which is yet perhaps the most fruitful of all—it consists in the presence of a certain amount of unburnt gas left in the tube after turning off the supply; this portion of gas gradually escapes and pollutes the atmosphere. A chemist of our acquaintance always disconnects the rubber, and applying a light to the burners blows through the pipe. The breath carries forward the unused gas, which then gets burnt and thus no escape is produced. We have recently seen a most ingenious mode of getting rid of this surplus gas. Instead of the rubber being fitted on a plain brass nozzle it is attached to the lower arm of a T-piece (the arms being placed vertically) which takes the place of the nozzle; the upper part of the T is fitted with a tap and an ordinary fishtail or other gas burner, which is usually kept closed. When it is desired to put away the burner after use this subsidiary tap is turned and the burner lighted while the heating burner is still alight. The tap nearest the main is then turned off; the gas ceases to burn at heating burner, but a small light will be seen at the illuminating (upper) burner and will continue until all the gas in the tube has, by reason of its lower specific gravity, escaped through the upper burner. We can commend this as a most useful and practical suggestion.

Then, again, there is—still referring to alleged objections—the cost of employing a fitter to adapt some arrangement for attaching a burner. Now this really need be no difficulty. Mr. Fletcher clearly explains in his various lists a method of attaching a simple little tap for the purpose, a method that a child almost might use. He even makes still another form of tap, which is attached to any ordinary gas bracket. The arm of the bracket is unscrewed, the new tap is screwed on to the female screw of the existing bracket connection, and then the arm is again screwed on. We have then a simple arrangement always at hand without calling in any plumber, and which can be used or not as occasion may require.

There is still the observation to make, that valuable as are the mixed air and gas smokeless burners now to be found in almost every house in the country where gas is used, it is to be remembered that the admixture of air with the gas is only for the purpose of preventing smoke when a vessel of any sort is placed with a gas flame playing over it, for contrary to the usual opinion, the heat from a certain amount of gas is just the same whether it is burnt under ordinary conditions at the familiar illuminating fishtail or other burner, or is first mixed with air before burning. As a matter of fact the illuminating burner when used as a boiling burner would nearly always give a coating of soot to the vessels, owing to the combustion being rendered imperfect through the incomplete and inefficient supply of air to the outer parts of the flame.

Where it is desired to carry the gas some distance from the nozzle to which the indiarubber tubing is attached, economy may be studied by using long glass tubes, joined by short lengths of rubber, the glass being far lower priced length for length than the rubber.

We have said nothing about the furnaces, reverberating or otherwise, for reduction of residues, enamel making, &c. These at some future time may be treated in an article by themselves. Suffice it to say that we have now shown the usefulness and economy of easily available gas appliances, and have shown also how the unpleasant odour so much objected to may be avoided without difficulty.

SMALL ENLARGEMENTS *VERSUS* DIRECT NEGATIVES.

EVER since the first introduction of photography with negatives the subject of the production of large pictures from small originals has been one which has furnished a prolific source of discussion, and, from the attention it has always received, it might, possibly, have been considered as settled. Evidently this is not the case, seeing that it is still of sufficient importance to have formed the topic for discussion at the last ordinary meeting of so important a body as the Photographic Society of Great Britain.

The discussion, in this instance, was not so much as to the best plan of producing pictures of large size, but those of only modest dimensions—twelve inches by nine being specially mentioned. In passing it may be mentioned that these proportions are far better for landscapes than the long recognised ones of twelve by ten. If a professional photographer has to execute work of this size he would, there is little doubt, take the pictures direct. But any one who has had experience in the field with a twelve by ten—or nine—outfit is fully aware that it is a "pleasure" not to be indulged in often without an assistant, unless the artist be endowed with extraordinary *physique* and exceptional powers of endurance. It is for this reason that so few amateurs affect direct pictures of this size.

As the subject was first introduced at the meeting referred to, it was somewhat ambiguous, but it soon resolved itself into the question as to the best method for the amateur to produce, from his favourite seven and a half by five plates, pictures not less than that mentioned, and various plans were suggested. Usually, in discussions of this character, it has been assumed that the original negative is much smaller than that indicated on this occasion, and this somewhat modifies the conditions so far as the ultimate result is concerned. In most former discussions, when this subject has been under consideration

from an amateur's point of view, negatives of about the quarter-plate size, or such as those taken with the so-called pocket or detective cameras, have been alluded to, but in this instance those of double that size were in question.

An enlargement to twelve inches by nine from a negative seven and a half by five is an amplification of a trifle over one and a half diameters, whereas one from a quarter-plate means three diameters—a very wide difference. Of course, with the latter degree of amplification, all spots or defects are magnified three times, but in other cases they are but half this. Again, any lack of sharpness in the original is rendered doubly as conspicuous in the one case as it is in the other. But this is not all, as we shall presently show; for even when the amount of enlargement is the same, the size of the original negative is still an important factor in the case. The enlargement from a quarter-plate to a half-plate is about equivalent to one from a negative seven and a half by five to twelve by nine—namely, one and a half diameters. But all things being equal, the larger picture will possess a far more satisfactory appearance. In the first place the smaller size picture will always be looked at from a much nearer point of view, and will, therefore, be more closely criticised than the larger, so that minor imperfections will become the more conspicuous. The finer details, in most instances, will appear much coarser in the small picture than in the larger one. This arises from the granularity of the image, owing to the particles of the bromide of silver being too coarse in themselves to render the finest details in their true proportion.

If we consider for a moment how exceedingly minute some of the lines and points seen in nature are—say the hairs in a man's beard for example—we can form some conception of how extremely fine and delicate they must be in the negative for them to be in correct proportion. All know how very large the particles of bromide of silver are in some dry plates, particularly in those of the most sensitive kind. Now it is clear that the coarser the particles are, and the smaller the image is, the less correctly will the finest details be rendered. The atoms of bromide of silver in the film of a seven and a half by five plate are, of course, the same size as they are in that of a quarter-plate, but the size of the image on the former will be nearly double. Consequently, if the molecules of bromide be too coarse to render the finest details correctly, or in their true proportion, in the smaller image, they need not, necessarily, be so in the larger; and, even if they should be, then the error will be reduced to one-half in the larger negative of what it is in the small one. And, as a consequence, when the two negatives are enlarged the same number of times, whatever they may be, the result from the larger one will be the more satisfactory of the two.

Much of the "woolliness" often seen in portraits which are enlarged from small negatives is due to the molecules of reduced silver, in the original, not being sufficiently fine to render the most delicate portions of the picture correctly. Although this woolliness is more conspicuously seen in the enlargement of a portrait it nevertheless exists just to the same extent in one of a landscape, though it is not so distinctly recognised as such. From this it will be seen that when small negatives are taken with a view to their subsequent enlargement and the best results are desired, the plates should be prepared with an emulsion in which the bromide of silver exists in the finest possible state of division, even if this quality entails the sacrifice of a certain amount of rapidity.

In the foregoing we have pointed out some of the reasons

why better enlargements can be made from negatives of moderate size than from the small ones, so frequently advocated for amateur purposes.

PROPOS of our article in last week's issue describing a method of vignetting by a mask of thin sheet lead, we have received from Messrs. George Mason & Co., Glasgow, a sample of metallic vignetting masks which have for some time been manufactured and sold by this firm. While those of Messrs. Mason & Co. are highly effective, they differ from Mr. Lyonel Clark's to this extent, that they are composed of thin zinc, with serrated edges to the aperture, which also turns back all round, while the speciality of Mr. Clark's lies in their being formed of very pliant lead, which are retained in position by being lapped over the sides of the frame.

Do dry plates keep so well now as they used to do? This is a question put the other day. Some time after gelatine plates became general it was assumed by many that they would keep almost indefinitely, and cases were quoted where they had remained good for a considerable period and under decidedly adverse conditions. Experience has, however, proved that several brands of commercial plates very quickly deteriorate, and show the well known iridescence round the margin when the negative is developed. This defect is usually attributed to sulphuration, but how produced is very much a matter of opinion, as all the theories hitherto promulgated are open to question. May not the gelatine itself, in some instances, be an important factor in the case? Many of the finer kinds of foreign gelatine sold in thin sheets—such as those used by some dry plate makers—owe their whiteness to their being bleached with sulphurous acid. Some samples of these gelatines that we have met with in commerce have possessed a very strong and unmistakable odour of burning sulphur. Such gelatines, it is scarcely necessary to say, are certainly undesirable to employ in the manufacture of dry plates; yet we have seen them used and excellent plates result, but we had no opportunity of judging of their keeping properties. Keeping qualities in dry plates are important, and are well worthy of consideration with manufacturers, although this is a subject which appears to receive but little attention at present.

A NUMBER of letters have appeared in our daily contemporaries on the subject of Mr. Mayall's method of colouring photographs. Some of the letters have been amusing enough if only on account of their ambiguity. Evidently some of the correspondents have assumed, like the writers of the leading articles on the subject, that the pictures (?) are actually produced photographically in the natural colours instead of being coloured by hand. But Mr. Mayall has made no such claim, nor could he do so. In the matter of coloured photographs there are "two Richmonds in the field." There is another scheme really claiming to produce "photography in natural colours" being exploited just now. Of this second venture we may have something to say next week.

In the Science Department at South Kensington are some examples of early photography which are interesting as regards permanency. They are transparencies on glass by the collodion process enlarged from small negatives of the moon and the eclipse of the sun of July 18, 1860, taken by Mr. Warren De la Rue. Some of them appear to be unaltered, while others have become much discoloured. We are unaware whether they were toned or not, but some look very much as if they had been treated with mercury. In most cases where they have become discoloured, the discolouration appears to have been caused from moisture being imprisoned between the glasses and acting on the image. This interesting collection at the present time looks in a very neglected condition, and as if the pictures, probably, would not have changed to the same extent had greater care been bestowed upon them. This is to be regretted, as very early photographs by the different processes are now becoming rare, and they will always be valuable for reference, particularly when permanency is in question.

A SHORT time back we commented on the faded condition of many out of a series of portraits in the Patent Museum, and the desirability of having them copied before the deterioration proceeded further. Faded and fading photographs are not confined to the Patent Museum alone, as they pervade the different departments at South Kensington generally. This is somewhat to be wondered at, seeing that some well-known photographers are connected with the establishment. At the time some of the photographs were produced there was no really permanent method of printing known. But now there is no reason why these pictures should not be copied and printed by a permanent process—carbon or platinotype, for example. Intaglio plates by the etching process are now produced commercially at a low rate, and it would not be costly to have the photographs reproduced by this means. In this case the image would be in printing ink, and the plates might be retained for the production of impressions whenever required for other museums or exhibitions. Surely if the photographs are of sufficient interest to have a place in any of the departments, they are valuable enough to be properly maintained instead of being, as they are, little better than a reproach to photography. So much money is annually granted for the South Kensington establishments that a little extra for so useful a purpose ought certainly not be begrudged.

AMONGST the photographs in the different departments at South Kensington, those shown in the Indian section seem, on the whole, to show the greatest signs of stability of any of the silver prints. Whether this is in any way due to the vigorous character of the negatives from which they were printed or not, it is of course impossible to say, but there is ample evidence in the prints that they were made from much stronger negatives than are in vogue at the present time. The character of the light in India is such that it conduces to vigour in the negative, especially when the wet collodion process was employed.

ON THE PRESERVATION OF FERROUS SULPHATE IN SOLUTION.

ONE of the chief drawbacks to the use of the ferrous-oxalate developer is the difficulty of keeping it in its best and most active condition. This difficulty has only been removed a stage further back since the introduction of the method of preparing it by separate solutions of ferrous sulphate and oxalate of potash mixed when required for use, the ferrous sulphate being as prone to change as the mixture of the two solutions. In THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for the present year, two or three suggestive articles may be found bearing on this subject.

One recommends keeping the solution of ferrous sulphate saturated with carbonic acid gas. This, however, is not easy unless the arrangement adopted allows the gas to be accumulated under pressure as in a gazogene, as otherwise it is difficult to extract the solution for use without admitting atmospheric air, which quickly leads to oxidation, besides which there is some uncertainty and trouble as to obtaining the ferrous sulphate itself in a state of pristine purity. If this is attempted by washing the crystals, it is uncertain where to stop, and impossible to weigh the wet crystals, and even if weighed in solution by the specific gravity method there is complexity and room for error.

A more excellent way is therefore desirable, and this is found to perfection by resorting to a method used by analytical chemists for reducing the persalts of iron to the protosalts, and that is by the introduction into the solution of ferrous sulphate of small fragments of metallic zinc along with some acid—citric acid will suffice. For the purpose in view, commercial sheet zinc answers perfectly well, and its impurities have the advantage of setting up that galvanic action which is necessary for its rapid action. The analyst, who requires to use the pure metal, has to employ platinum to set up this action.

Any one who tries the experiment of inserting a few strips of zinc into a yellow solution of iron salt will be charmed with the rapidity and perfection of the result obtained after standing a few hours. Hydrogen gas is liberated and must be allowed to escape if an ordinary bottle is used, or it may burst.

The writer by this means most effectually deoxidised a very yellow

and foul looking solution obtained by dissolving a pound of green vitriol. Paraffine oil, to the depth of three-quarters of an inch, was placed also in the bottle, through which the gas escaped. The solution is now a brilliant green. To remove it for use readily, a syphon is formed of glass tube bent into an inverted U shape; one leg is passed through a cork in the neck of the bottle, the other is supplemented by a piece of indiarubber tube provided with a clip; another short tube passes through the cork and is lightly covered (not closed) with a cap of indiarubber tube to provide for the admission of air whilst excluding dust. The syphon being once started, stands full; when not in use the clip with the indiarubber being raised is supported between the glass tube and the bottle, and this allows of the bottle being removed to a shelf or table without risk of breaking the syphon.

Some solution of ferrous sulphate prepared with carbonic acid gas, which had become a little yellow through accidental introduction of air, was quickly revived by the introduction of a minute fragment of zinc.

The quantity of zinc used up in deoxidising the solution of green vitriol was hardly more than one inch square of sheet zinc. Mere was placed in, but when the action was found to be complete the solution, including the paraffine oil, was decanted into another bottle without any trouble.

The adoption of this simple process enables one to be always supplied with the means for ferrous oxalate development, and thus one of the drawbacks to its use at once vanishes.

Prepared with ingredients thus purified the developer will be found exceedingly powerful, and of great value where stripping films are in use or where negatives are being prepared for enlargement, as the great translucency of negatives developed by ferrous oxalate saves much time during the process of enlargement, and as to the stripping films, allows of the stripping process to be deferred to any length of time with the certainty of success. The property which metallic zinc has of reducing persalts of iron to protosalts suggests the possibility of employing it for keeping in active condition a ready mixed solution of ferrous oxalate or even of restoring with promptitude and efficiency the solution, after it has been already used for development. In chemistry, above all, it is never safe to prophesy unless you know, and until trial is made one cannot be sure; but should this suggestion prove feasible an immense economy will be effected in saving the large amount of oxalate of potash hitherto wasted.

Metallic iron used to be employed for the purpose under consideration, and it may be that its inefficiency was owing to the absence of any provision for the second metal necessary to set up galvanic action, the metallic iron employed being far purer than ordinary zinc.

In using zinc to reduce ferric oxalate to ferrous oxalate as in the used developer, there will not be that easily observed change in colour which helps so materially one's proceedings in the case of ferrous sulphate. But if the solution of ferrous oxalate be kept in a gazogene such as used for home-made soda water, the hydrogen generated by the zinc can be made to ensure the absence of air and suffice to expel the liquid on pressing the tap. If necessary, this may be supplemented by introducing a few crystals of bicarbonate of potash and citric acid.

G. A. KENYON, M.B.

P.S.—Since writing the foregoing I have utilised that modification of the gazogene used for retailing soda water under the name of "Syphon." One of these is obtainable for a couple of shillings at any chemist's. Half a pound of sulphate of iron dissolved in thirty-two ounces of water was introduced, then some strips of zinc about three-quarters of a square inch, then 120 grains of bicarbonate of potash and 150 grains of citric acid, both in crystals. The screw-top was then leisurely affixed. This gives a solution half the strength of the Eastman formula, so reduced to facilitate measuring, with the required amount of free acid.



PAPER NEGATIVES IN ORDINARY SLIDES.*

BUT the gumming business still exercised my mind, and the trouble of cutting off the exposure and removing the fragments from the carrier; but a better method would not suggest itself until one day I saw a clerk "graphing" some circulars on one of the slabs of moist gelatine used for the purposes of cheap reproduction. Here was the very thing I wanted; something that will stick, not too much, but just enough. The only question was, How long will it retain its adhesive power and still exhibit the obliging readiness to part company with its prisoner? I may say that I have satisfied myself on that score over a period of several weeks, pieces of paper which have been adherent to the ferrotype plate during that time coming away with the greatest ease.

The gelatine mixture I make as follows:—

Gelatine (or fine glue)	1 ounce.
Golden syrup	$\frac{1}{2}$ to 1 "
Glycerine	4 ounces.
Water	7 "

Soak the gelatine until thoroughly swelled in the water, and, having liquefied by heat, stir in and thoroughly incorporate the glycerine and molasses. The latter gives a stickiness and "grip," which, with some samples of gelatine, especially of the "hard" class, the glycerine seems to partly counteract. The softer non-alumed gelatines answer best, or a good sample of glue may be used.

And now for the method of using this. I need hardly say that the prospect of leaving a sensitive gelatino-bromide paper film in contact with a moist surface, such as that the mixture gives, for perhaps a week or two, did not strike me as very promising, so I departed from the "chromograph" method of bringing the whole surface of the paper into contact with the gelatine, and contented myself with causing it to adhere only at the edges. The following is the plan I adopt. The melted gelatine is poured out into a flat, shallow dish (the lid of a tin biscuit box answers well) to the depth of an eighth of an inch, and this is placed on a stove to keep it liquid. The metal carriers are then dipped into this, each edge successively being allowed to set before the plate is turned so as to prevent the gelatine "running." In this manner a neat, clean edging of the adhesive is quickly applied, and the carriers are then reared up on a clean place until wanted for use.

To apply the films, upon a sheet of clean paper lay one of them sensitive side downwards, upon this accurately superpose the carrier, and upon that again another negative paper, this time sensitive side uppermost, covering the whole with another sheet of clean paper, and passing a squeegee three or four times over the whole. The two films will then be found in perfect adhesion. If the carriers have been "edged" some time and become surface dry, instead of the squeegee a warm iron may be used to smooth down the papers; this, by slightly melting the gelatine, will cause adhesion.

To remove the films after exposure, it is only necessary to insert the point of a penknife between the papers and its support and to gently separate them, pulling at the raised corner, taking care not to tear the paper. If they will not part—a contingency that has not arisen with me—the whole, carrier and films, may be soaked in water until the gelatine has sufficiently softened; they will then be easily removed for development.

By adopting this plan any one who is the possessor of, say, a $7\frac{1}{2} \times 5$ camera and three double backs, may at a cost of about seven or eight shillings for a dozen ferrotype plates, 14×10 , equip himself to start on a tour with six dozen sensitive films and with nothing in the shape of photographic impedimenta to carry beyond his ordinary camera case and stand.

C. BECKETT LLOYD.

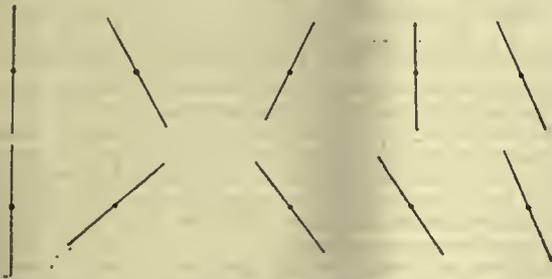
NOTES ON SOME AMERICAN STUDIOS.

AMERICAN portraiture is so well known in England, or, for the matter of that, I suppose, all the world over, that a few words on a couple of New York studios or "galleries" which I recently had the pleasure of visiting may not be uninteresting to English readers. It was through the kindness of the editor of the *Photographic Times* that I had the opportunity of visiting these, of which kindness, were it not a purely personal matter, I should like to say much.

* Concluded from page 325.

The name of Mora is so well known in Britain that it was with pleasure I hailed the opportunity of calling on the great man. Mora is a much younger man than I expected to see, considering that I was familiar with his work, even north of the Tweed, I think quite fifteen years ago. He has not the appearance of being over forty. He received me with great cordiality, and was kind enough to let me see the whole of his establishment, which is of quite historic interest, having been the first Daguerreotype gallery in America. It was opened in the year 1841 by J. Gurney, who did a very large business in Daguerreotypes from that time till the glass positive superseded the older form of sun painting. The magnitude of his operations may be imagined from the fact that he was in the habit of turning out portraits as large as 17 x 11 inches, and that he found it worth his while to have a steam engine to work the wheels on which he polished the plates. These particulars I had from Mr. Gurney himself, whom I afterwards had the pleasure of meeting.

As might be imagined, a studio which has been in use for over forty-five years has little of the varnish of newness about it. Indeed, Mora appears to be by no means desirous of show. The gallery is, I imagine, not very different from what it had originally been, and one was impressed with the generally unassuming appearance of a place so well known. The studio itself is sufficiently large, without being by any means colossal. It faces, I think, to the north, and, whilst I was in it, at any rate, work was carried on with a great deal of light, one reflector only being used to light up the shadow side of the face. This is divided horizontally, each half being on hinges, so that it can be caused to take any of the following forms, or various others, ac-



ording as it may be desired to cast the light upwards or downwards, or horizontally.

Mora's method of posing is quite different from that of any other photographer I have seen working. He studies the face for a few moments, first one side and then the other, and appears at once to make a mental note of what sort of picture he will make. He places a chair in position, and immediately that the sitter is in it, goes right up to him and adjusts his head, &c., not appearing to need to look what the effect will be from the camera, but knowing by instinct—or rather, I suppose, it really is by great skill and long practice—what the effect seen from the camera will be. He adjusts the reflector, fixes a mark for the sitter to look at, and leaves all the rest to his operator.

Mora still prefers to use wet plates rather than dry whenever he can, wherein I believe he stands alone amongst New York photographers. I could not get him to give me a very definite answer as to why he prefers it. He would not commit himself to any opinion that he got better results, and, indeed, beyond saying that he could with a wet plate see at once what his result was, he would give no reason.

I had the honour of sitting to Mora. He made in all six exposures—or, to speak more strictly, he posed me for six exposures—two on each of his wet plates, and two on a dry plate. I noted that the exposures on the wet plates were from twenty to thirty seconds, whilst those on the dry plate were only about three seconds. With the wet plate, the lens—a Dallmeyer portrait lens, 3 $\frac{1}{2}$, I think—was used nearly full aperture; with the dry plate, a stop about one-third the diameter of that used with the wet plate was inserted. Now it follows, from this, that whatever may be the average ratio of the rapidity of wet and dry plates, the particular dry plate used on this occasion was at least eighty times as sensitive as the particular wet plate.

I saw all the plates developed, the wet plates in the usual way coming up very rapidly, and requiring no intensification or redevelopment. The dry plate developed with a slowness and caution very different from what is customary in the dark rooms of studios in England. I think quite twenty minutes were occupied in bringing it up; but I was told that, as a rule, development went on more rapidly. Undoubtedly, the result was a negative of magnificent quality.

I may mention that Mora—or, rather, his assistant, because, as I have said, Mora himself confines his attention to posing merely—works dry plates by artificial light filtered through "Debenham's" medium, in which he strongly believes.

It is well known that American photographers do much more work than English in large portraits taken direct, and Mora is no exception to the rule. I saw huge piles of negatives from which prints might be made on whole sheets of paper. Of course, for these dry plates are used, and little seems to be thought of negatives about 24 x 18 inches in size.

I saw, at the Scovill Manufacturing Company, a camera which had been made for some enterprising individual who intended to go in for direct portraits on plates 34 x 24—a goodly size, surely. Enlarging appears to be comparatively unpopular with American photographers, and certainly the impression made on me by the large direct portraits that I have recently seen is, that there is something in them which enlarging will not give.

The price that Mora charges is, I understand, fourteen dollars (say £2 18s.) for a dozen cabinets; ten dollars (say £2 2s.) for half dozen; and I imagine that he has no difficulty in getting the price.

The next studio that I saw was one of a very different character from that just described. It is the gallery of C. D. Fredericks. This is an establishment for turning out large quantities of work at comparatively low prices. Not that there was anything of the "cheap and nasty" about the work sent out by Fredericks; on the contrary, it would rank in England as excellent portraiture. The general aspect of this place is the very opposite to that of Mora's. Here everything is magnificent to a degree. The reception room, which occupies the whole of the ground floor is really quite a picture gallery, and is a place where an hour or so might very comfortably be spent.

Again, I was allowed to see whatever I wished through the whole establishment. Upstairs there are two studios where dry plates only are used, and where, at times, Fredericks told me as many as 250 sittings a day are got through. The printing part of the establishment is on the roof, and it is not unusual, I was told, to turn out as many as 1500 prints in a day, the smallest size being cabinets, for I should mention that the *carte* appears to have entirely disappeared in America, or in New York, at any rate. The prices charged are five dollars (say £1 1s.) per dozen cabinets, but I understand that a great deal of "club" business is done. In this a certain number—I think a minimum of six—form a club, and get a very substantial reduction in prices; in fact, from five dollars to three, the latter price (12s. 6d.) being one which would be considered very low for even tolerable work in England.

In both the establishments that I have been writing of I saw the printing department, concerning which let me first of all say, that the light in New York is of such a character that it is not necessary, as it is generally considered to be in London, to have a separate printing establishment at some distance out of town. Each photographer does his own printing at the top part of his own house.

The favourite albumenised paper in both Mora's and Fredericks's house is of German manufacture, evidently, by the smell of it, from the same source as a very favourite brand of paper in England. The paper after sensitising is hung up by American clips at two corners, right over a row of Bunsen burners, the heat of which serves to dry it, the products of combustion of which appear to be in no way feared. When dry the paper goes to the fuming box, which is simply a rectangular box or cupboard in which the paper may be hung vertically, and on the bottom of which may rest a dish of liquid ammonia.

Fuming is, as is well known, universal, and all but universal in America, and I must say that the impression produced on me by the results I saw was that it is wise to use it. Taken all round, there was a greater richness in the prints than I have been accustomed to see at home, and this certainly not due to the paper used—for that in the instances I have been referring to was of a well-known European brand—but due, I feel sure, to the fuming, and to that only. A deep purple or almost black tone is the one most affected. I saw little or nothing of the warm browns now so popular in England.

A few very good platinum prints of large size and excellent quality I saw; but this printing process appears not by any means to have reached the popularity that it has "on the other side," nor has the gelatino-bromide process—but this latter follows naturally from the fact already stated, that enlarging is much less made use of.

Gelatine dry plates—both bromide and chloride, I believe—are specially prepared for lantern slide and general positive purposes, but, so far as I have seen, only the black tone is affected. I do not know whether because, as in the case of prints on albumenised paper, the brown and reddish colours are not cared for, or because difficulty is found in getting these colours.

On the whole I think the Americans well sustain their reputation for supremacy in the matter of portrait work, certainly at any rate where large sizes are concerned.
W. K. BURTON.

ODDS-AND-ENDS.*

A MEMORANDUM now as to development, but one I would not venture to state as a "fact." Most photographers are, I think, in the habit of finishing off development, when sufficient density is all but obtained, by adding another drop or two of alkali, in order to get "pluck," as it is called. My impression is that this finishing touch is best given by a different alkali from the one that development has been carried on with, thus—an ammonia developed plate I would finish off with carbonate of soda or potash, and soda I would finish with ammonia. This may be a superstition, but for a long time I have fancied the plan to produce the best printing negatives.

I have sometimes, when a plate has been half developed with ammonia, washed it under the tap and finished in a new solution of pyro and potash, or soda. Indeed, so that you keep development in hand, that is, do not let it go on too fast, it seems to me you may play as many pranks as you like without running any great risk of ruining your negative. When Mr. Wollaston, who gave us the demonstration last session of the Eastman paper process, explained his developer, those of you who heard him will remember that he, too, though advising the use of the soda developer, recommended ammonia as a finisher.

Intensification.—The common plan is first bichloride of mercury, then, after washing well, weak ammonia—but I find sulphite of soda much pleasanter than the latter. First soak the negative for a few minutes (though this is not absolutely necessary) in water. Put into saturated solution of bichloride for a very short time till it just begins to bleach, wash for a second or two (that is an important saving in time), then put in a bath.

Saturated solution sulphite of soda 1 drachm (fresh mixed).
Water 2 ounces.

The negative quickly darkens, but will not *over do* itself, and when finished is of fine steel blue colour, like a ferrous oxalate negative, the clear glass not being in the least clouded. If still too thin, repeat the whole process, as often as you like. I have done it three times, and finished with a negative that no one would suspect to be an intensified one.

One unfavourable day in the spring, having obtained permission, I visited Belle Vue Gardens and met with many failures. One portrait that I attempted to take was that of the polar bear, an animal always in distressingly active perambulation. I got a shot at him as he was passing along the nearest part of his circular racing path, and on coming to develop could get nothing at all out of it. Still I carried it to the end, but when the hypo had cleared it, I found nothing but red fog and the very faintest trace of an image, which no one in the world would have supposed to be a bear. I put it aside, and next morning intending to wash the film off put it under a tap of very hot water, and was surprised to find that the image became very much clearer, so before the film gave way I stopped the hot washing and put it away again. When it was dry red fog still enveloped it, so I put it in bichloride of mercury, which, of course, only had the effect of whitening it; then in sulphite of soda, which almost cleared the fog away, leaving a negative which if neither useful nor ornamental was still in great contrast with the original state, and a great advance upon it. Query: If under exposed plates, after being protected by alum, were plunged into hot water for a second or so, would development be affected?

It is sometimes a little difficult, even with such injunctions as Mr. Brunel's in one's memory to distinguish a fact. Here is an instance:—

On coming to develop the plates I exposed in Norway, I was much troubled by frilling, though I had never met with it before to any serious extent in the plates I was using (Fry's). My friend Mr. McKellen advised me to use a solution of Epsom salts before commencing development and I adopted that course. I also used sulphite of soda in the developer, which I do not commonly use, and for the purpose purchased a new bottle, with a well-known name upon it. I must now quote from my notes made at the time.

Plate 1. Put plate for five minutes in solution (ready saturated) of Epsom salts. Washed well under tap. Put it in pyro solution, two grains to ounce, with half drachm saturated solution sulphite of soda, just made up. Left plate in this for five minutes, and on uncovering it was surprised to find it almost fully developed, but appearing rather over exposed. Washed it under tap and placed it in a weak

* Concluded from page 330.

bromide solution; finished development by putting it back into the pyro.

Plate 2. Same treatment, but Epsom salts much diluted. Result same.

Plate 3. Added half drachm ten per cent solution of washing soda to the pyro. Result: film frilled completely off.

Altogether I developed five plates, varying the proportions of the developer, and with the exception of the one mentioned with which I used soda, all developed out without an alkali.

How was this to be explained? I had the Epsom salts analysed and found pure. I blew up Mr. McKellen for recommending such stuff, but this did not explain where the alkali came from. Then I suspected, as I ought to have done before, the sodium sulphite, had it analysed, and the "fact" was made clear; it was strongly alkaline, and it, in combination with the pyro, had developed the plates.

I feel that I have given quite sufficient odds-and-ends for one evening, but as paper negatives are occupying a good deal of attention at present, will give a developing formula of a friend who formerly resided in Manchester, Mr. T. G. Whaite, now of Edinburgh. He advises pyro and ammonia instead of pyro and soda, and gives the following formula:—

A.
Pyro, made up with sulphite of soda of the usual strength.

B.
Ammonia ('880) 6 drachms.
Bromide of potassium 2 "
Water 6 "

Take of pyro, solution A 1 ounce,
" B 2 drops,

and increase the quantity of the latter as required up to twelve drops.

This, it will be observed, is quite the ordinary "Wratten" developer, except that a larger quantity of bromide is used.

Mr. Whaite sends me a few platinotype prints from paper negatives taken in the summer and developed by the above. These prints speak for themselves, and are some of them as good in every way as they could be. They speak most eloquently not only for the method of development, but for the paper which Mr. Whaite has used, and with great enthusiasm recommends.

One might go on in this way all night, but I think I have made good my title, and have produced a little batch of odds-and-ends which I thank you for so quietly listening to.

ABEL HEYWOOD, JUN.

HALATIONS IN NEGATIVES.

CHAPTER II.

THE second class of defects in bromised films, developed with alkaline pyro or ferrous oxalate solutions, may also be denominated a species of halation, but the effects produced must be traced to other causes than reflections from the back surface of the glass. Supposing that we are photographing fine white lines on a dead black ground, that we give a long exposure, and continue the development till the reduction of silver has reached the bottom of the film, it will be seen that the line is broader at the bottom than at the top. Or, again, *per contra*, if the lines to be represented are black on a white ground, it will be found that, by the same treatment in exposure and development, the lines will not be represented by clear glass as they ought to be, but will appear to be gradually shaded off from the white edges. Now it appears to me that this peculiar effect can be readily explained by the following process of reasoning based on well-known phenomena.

In the first instance, namely, a white line on a dark ground, the refracted white rays impinge on the surface of the film, say, in perfect focus, but in passing through it they are diffused laterally, so that they act chemically on all the sensitive particles with which they come in contact. The consequence is that, if the film be a thick one, a transverse section of the developed white line would appear broader at the base than at the top or surface of the film—in fact, pyramidal.

In the second instance, namely, a black line on white ground, the conditions are reversed, so that the light from the white surface, when the negative is developed, almost obliterates the line by excessive diffusion.

I have heard an attempt made to explain these phenomena by catalysis, or contact action; but I do not think we need call in the aid of a very mysterious force to enable us to explain what, I think, may be made quite clear by the simple diffusion of light through a translucent medium.

While on this subject, I may as well place on record a method,

devised by the late Major Russell, whereby an alkaline-developed bromide negative could be converted into a positive transparency. I have not tried gelatine plates, but the plan succeeds admirably with films prepared by collodio-bromide. When the picture has been developed to the greatest intensity of which it is capable, but not fixed, dissolve away the image by means of dilute nitric acid. If the acid be too strong it will attack the unaltered bromide; therefore, the best way to proceed is to begin with a little well-diluted acid, and to pour on and off the plate, gradually adding strong acid until the image is completely dissolved away and the film whitened. On holding the plate up to the light the picture shows as a transparency, the gradations being represented by different thicknesses of bromide of silver. If the collodionised film be now thoroughly washed, to remove the nitric acid and nitrate of silver, then flooded with tannin solution, exposed to daylight for a second or two, and again developed with alkaline pyro, a good and vigorous positive will be the result.

This experiment of Russell's is more interesting and curious than useful, because very few would feel disposed to spoil a good negative for the sake of a single positive. GEORGE DAWSON, M.A., PH.D.

CONTINENTAL PHOTOGRAPHY.

[Translations and Abridgments.]

PHOTOGRAPHING QUARRY EXPLOSIONS.

MONSIEUR G. BALAGNY writes that on April 21 last, at eleven o'clock, about twenty-six persons armed with cameras, and talking photographic "shop" surrounded the ticket office of the Argenteuil railway *en route* for Volambert; they had been invited by M. Albert Londe and MM. Lacauchie and Nitard, the directors of the Volambert gypsum quarries, to visit the latter to see what they could do in the way of photographing quarry explosions. M. Poyet, one of the artists of *La Nature*, had drawn up a card of invitation, full of humour and spirit, which M. Londere multiplied by photography. Each visitor was requested to bring his apparatus and six dry plates. The visitors alighted at Argenteuil, where they took luncheon, enlivened with Argenteuil claret, almost the only wine in France the production of which has, so far, been respected by the phylloxera.

Among those present were MM. Gaston and Albert Tissandier, M. Poyet, M. Maréchal, editor of *La Nature*, M. G. Ducom, M. Rolland, M. Darnis, M. Fabre, M. Geoffroy, M. Saucé, M. Londe, M. Dessoudeix, M. de la Bretonnière, M. Mernet, M. Hubert, M. Petit, MM. Arbey Brothers, M. Verdier, M. Renard, M. de Pauniat, M. Wallon, and Dr. Ranque.

At two o'clock precisely the whole party found themselves before the mass to be removed by the explosion, and beneath a burning sun took up their positions where they would, without placing themselves too near the mines. Two explosions had been arranged, and many photographers arranged themselves in a line before the first point indicated; several others bravely separated themselves from the group to take the profile instead of the face of the explosion. The artists in black thus dispersed with their three legs upon the white soil had a picturesque effect.

When all was ready, three successive regulation whistles were given, as the signal for firing the mines. A series of detonations followed, and in several seconds was a formidable outburst, which projected to about fifty metres in the air masses of rock, accompanied by stones and lumps of chalk of all sizes. No note was taken of how many exposures were made during this first explosion, but for the purposes of the present narrative more attention was paid to the second explosion, the photographing of which was the main object of the expedition. The block was an important one, and had to be removed all in one mass.

In general it is not easy to prevent the direct rays of the sun penetrating the dark slides, and on the present occasion the rays shone directly into the lines of the opening of the slide shutters, which was an objectionable feature, especially when the great sensitiveness of the plates is considered.

The photographers took up a new position; three blows of the whistle were sounded, followed by a number of subterranean detonations breaking up the galleries. The block, no longer held by the base, was dislodged in two portions, and was projected upon the ground in the middle of indescribable noise and smoke. M. Balagny took a negative which well renders the explosion and gives at the same time the strategical positions of the photographers. He also, by desire of the gentlemen present, took two instantaneous groups upon 27 x 33 flexible films.

At five o'clock all were on their way back to Paris, agreeing that a charming day had been spent, and that a society for photographic excursions for amateurs and professionals ought to be formed. With

a few additional remarks M. Balagny's article closes, without saying more as to the nature of the negatives obtained.—*Le Moniteur de la Photographie*.

THE HYDROSULPHUROUS ACID DEVELOPER OF MESSRS. A. & L. LUMIÈRE.

Notices of the hydrosulphurous acid developer recently used in France have already appeared in the English photographic press, but in a recent number of *Le Moniteur de la Photographie*, Auguste and Louis Lumière give somewhat extended details. They express their belief that even the shortest action of light produces a latent image upon a photographic plate, so that the thing to be done is to bring the said image into view; the reason why at present certain plates appear to be under exposed is, that a sufficiently strong developer to bring out the image is not applied. M. Maignan, pharmacist to the Bron Asylum, had suggested to them the trial of hydrosulphurous acid for the purpose, which they then found upon trial to be very efficacious. Hydrosulphurous acid until recently has never been isolated in a state of purity, and only a few years ago M. Schutzenberger discovered that it was probably obtained during the action of aqueous sulphurous acid upon zinc. The solution takes a yellow colour all at once, due to the formation of hydrosulphurous acid, then it quickly loses its colour because of the decomposition of the latter, hyposulphite of zinc being formed, accompanied by a deposit of sulphur.

The fugitive nature of hydrosulphurous acid, accelerated also by contact with the air, renders the employment of it as a developer difficult, and makes it necessary to effect the development in the midst of the reaction; this condition is indispensable because the products of oxidation evolved during the complete reaction have the property of destroying the latent image. The best results have been obtained by using a saturated solution of sulphurous acid, and throwing into it the smallest possible quantity of zinc. Unhappily the nausea provoked by breathing the poisonous gas, the heating of the liquid, and the production of a veil of sulphide of silver due to the liberation of free sulphur, are considerable obstacles to the employment of this mode of development. It is likewise true that results obtained with it have surpassed those obtained with developers previously known, and give incontestable proof, say the authors, of the power of this new agent of photographic reduction.

THE ACTION OF LIGHT ON SALICYLIC ACID.

Dr. Phipson remarks that it has been stated that aqueous solutions of salicylic acid, such as are often employed in medicine and as a disinfecting agent, are altered by exposure to the solar rays in such a manner that any bottle containing a weak solution of the acid, and which is placed where solar light falls upon it several hours a day, loses all its acidity sooner or later, so that one or two drops of perchloride of iron then no longer produce in the solution their characteristic reaction. He himself has found that a solution of salicylate of lime, made with pump water, and exposed to light, is equally decomposed in a short time, and that at the end of several weeks the bottle contains a great quantity of white and brown filaments, consisting of algae and bacteria.—*Le Moniteur de la Photographie*.

CLEARING SOLUTION.

When a negative is slightly veiled, perhaps because of the use of ordinary water for developing and other purposes, the plate should be thoroughly washed, and then dipped into the following solution for a few instants only:—

Water	100 parts.
Ferrous oxalate	2 "
Alum	8 "

The negative will be cleared up in an admirable manner, and the whites left transparent.—*Photographisches Archiv*.

PHOTOGRAPHING BY GASLIGHT.

[A Communication to the Photographic Society of Philadelphia.]

THERE is nothing novel, nothing strange in the fact that certain salts of silver are sensitive to the moderate amount of actinic force contained in the flame of ordinary illuminating gas. Quite early in the reign of collodion some excellent work was accomplished by the use of such illumination in photographing interiors and dark places, but the difficulties attending the operation, the length of time required for exposure, and the consequent danger of the drying of the plate, did not contribute much to the popularity of the process. In fact, it was used only in extreme cases; frequently, merely to show the possibilities of the method.

With the advent of the extremely sensitive bromide of silver gelatine

dry plate, one might suppose it would have advanced in favour; but the superiority in power, convenience of application, and cheapness of the electric light, considerably depressed the general interest for it as an artificial source of illumination.

Portraits have been successfully made by gaslight, and even apparatus devised to utilise to the best advantage the force of the flame, but I think it may be safely said that at present no gallery in the world employs it.

Our object is not to show the superiority of gaslight over the other artificial illuminators, though we do think, had it been allowed in the struggle for existence to appropriate more of scientific and general interest, it would have differentiated much further, inasmuch as it possesses certain inherent good qualities which its more favoured rivals cannot claim.

We merely wish to call attention to its great value in photographing interiors. Indeed, in this province of the art it possesses advantages over daylight in softness of the general effect.

In our experiments we did not use any apparatus whatever, not even reflectors, employing merely the light of the ordinary burners protected by ground-glass globes.

The source of light was not intense—five bat-wing burners of a chandelier suspended from the centre of the room, 15 x 30 feet, the camera being placed at either extremity, and hence necessarily directed towards the light, but low enough to prevent the flames appearing on the ground-glass. A Ross' rapid symmetrical lens, six-inch focus, was used, and exposures given from ten to twenty minutes. The results will be shown at the close of the meeting by means of slides in the lantern. We imagine no one would be able to distinguish them from good interiors taken by daylight.

We have photographed the same room when illuminated by diffused sunlight, but have not obtained results as uniform in lighting. Daylight gave more violent contrasts, the darker portions of the room lacking much in detail, while the highly illuminated parts were too intense. It is especially on account of the evenness and general distribution of the light that we prefer gas to ordinary daylight.

Its advantages over burning magnesium wire are even greater. Our experiments with this pure white illuminator gave very harsh contrasts in light and shade, although we sought to modulate its action by tissue screens, and by distributing the illumination as much as possible. We did not try the electric light.

The exposures of ten minutes with gas lacked somewhat in detail, showing under time; but those of twenty minutes, as you will see, are pretty rich in detail even in the deep shadows. The plate we employed was, of course, the highest sensitometer number we could secure—some of Cramer's recent extremely sensitive brands. With the twenty minutes' exposures we developed with pyro and potash—of the ordinary stock solutions:—

Pyro	2 drachms,
Potash	1 drachm,
Water	2 ounces,

which sufficed to bring up all the detail, and to give good density without any extra addition of accelerator, which, we think, demonstrates the truth that an evenly-lighted subject really requires less time with a moderate light than one violently illuminated with a strong light.

While making these gaslight photographs, we were induced to try the action of the yellow gaslight in rendering the colours with orthochromatic plates.

Carbutt B plates and Seed plates were first placed in a preliminary bath, consisting of

Ammonia	1½ drachms,
Water (distilled)	7 "

and allowed to remain for a minute or two. They were then transferred to the orthochromatic bath, made according to the formula given in a package of Flandreau's orthochromatic solution, kindly sent by the Scovill Manufacturing Company:—

Water	5½ ounces.
Erythrosine	1½ drachms.
Ammonia	2 "

Here they were rocked for a little over a minute, taken out, drained, and dried in an ordinary drying closet.

They were exposed upon objects of blue, yellow, red, and green colours without the interposition of the yellow screen, making use of the light of a coal oil lamp with a reflector placed near the objects, in addition to the light of the gas flames. The time of exposure with the B plates was fifteen minutes; with the Seed, two minutes. The ordinary developer of potash and pyro was used. I was troubled much with fog, especially with the Seed plates, whose sensitiveness was probably affected by the ammonia employed, but the results ob-

tained in the rendering of the yellow and orange were surprising. I have a couple of prints, one from the fogged Seed plate, two from the clear Carbutt plates, which show this remarkable action. The oranges in the basket were very orange in colour, while the flowers were hyacinths of the palest blue, almost white—nevertheless, the deep so-called adactinic colour of the fruit is rendered as a high light, as in nature, only a few degrees below the flowers.

In the other picture, the long-necked vase is of a bright chrome yellow colour—which ordinarily is translated dark, the vase immediately behind it is ultramarine blue, the large urn light green, while the recumbent vase is vermilion. This last has scarcely taken better than with an ordinary plate.

The erythrosine, therefore, would seem to depress the action of the blue, and to render the yellow, orange, and green in their true relations, but not the reds.

Probably it would make an excellent plate for the yellowish greens of spring foliage.

I made some attempts at portraiture with ordinary plates by gaslight, and I show them merely to call the attention to the possibilities of modelling with light and shade.

I found, by using a small hand reflector of cardboard and a shader, one might, if possessed of the skill, model in an artistic manner the head, by directing the light and shade to any desired part. Of course means could be devised to shorten the time of exposure to less than a minute, and by keeping the reflector and shader in gentle motion, any required degree of light and shade could be secured, and much softness given to the image.

One recommendation has photography by gaslight. It is independent of time and season and state of weather.

We could not help noticing how strange it was for us to be taking pictures in a warm, cosy room, while without the wind and the rain were striving for mastery.

JOHN BARTLETT.

THE FOCUS OF LENSES.

[A Communication to the Camera Club.]

A QUESTION is asked in last month's *Proceedings* as to the best way of ascertaining the focal length of a doublet lens. I think it will be of greater use to our members to give a short *résumé* and critique on the various methods that have been proposed at various times for ascertaining the focus, rather than giving any particular cut-and-dried formula. Let us suppose that we are photographing any subject—say, a candle: this candle, called the *object*, is a spot of light emitting rays in every direction; of these, a certain quantity, in shape a cone, fall on the surface of the lens, which possesses the property of seizing them, and re-forming on the ground-glass a representation of the candle, called the *image*. We have then two definite points, the candle, or object, on one side of the lens, and the representation on the ground-glass, or image, on the other side. Now, these two points are called the conjugate foci of the lens, and the distances from the optical centre of the lens to these foci are called the conjugate focal lengths.

Now, we know that if an object, in our case a candle, is near to the lens, the camera has to be racked out considerably; if we bring the object nearer, we have still more to increase the distance between the lens and the image; if, on the contrary, the object be removed further away, the distance is shortened, until at last we find that, arrived at a certain distance, no further shortening is necessary, for the candle, and every object beyond it, is sharply represented. The reason of this is that the angle of the cone of rays coming from the object and falling on the lens has become so exceedingly small, that the rays are virtually parallel; and, although the position of the conjugate focus on the object side may be moved further and further off from the lens up to infinity, that of the conjugate focus on the image side does not alter. This immovable focus is then called the principal focus of the lens, which we can define as the focus of parallel rays, and the distance from this point to the optical centre of the lens is the focal length of the lens.

The principal focus is also sometimes called the solar focus, because the sun is so far off that its rays are parallel, and the point where its image is formed is the solar focus of the lens. The measurement of this distance would, of course, give us our focal length in a very easy manner, but, unfortunately, it is a matter of considerable labour to find the optical centre of a lens, as it depends upon the radii of the curvature of the lens. For a plano-convex lens, however, this point lies on the curved surface, and the focal length can be easily found by measuring the distance between the curved side of the lens and the image of the sun.

When speaking of lenses formed of two or more combinations, the focus is spoken of as the equivalent focus. This only means the solar

focus of the combination of lenses. It is called equivalent focus, because a single lens of such a focus would produce results equivalent to the combination of lenses.

LYONEL CLARK.

(To be continued.)

ON RED AND PURPLE CHLORIDE, BROMIDE, AND IODIDE OF SILVER; ON HELIOCHROMY, AND ON THE LATENT PHOTOGRAPHIC IMAGE.*

Silver Carbonate may be roasted in the same way as silver oxide, and yields a similar product. By heat its colour changes from yellow to black; it is probable that the carbonic acid is driven off at a lower temperature than that at which oxide is reduced to silver, and that with it escapes part of the oxygen. The residue is converted by H Cl into deep red chloride.

Action of Various Metallic Oxides on Silver Oxide.—If we precipitate ferrous oxide with potash and add to this silver oxide, or what amounts to the same thing, if we add to ferrous sulphate potash in excess and pour over this silver nitrate solution, the silver oxide separated by the potash is partly reduced by the ferrous oxide, and when treated with H Cl forms red chloride, the intensity of the colour of which depends within certain limits on the amount of reduction of the silver oxide.

Similarly if we treat solution of manganous sulphate with excess of potash and then add silver solution, we get an analogous reaction, except that it is much weaker and heat is necessary.

With chromous oxide the action is still weaker, but evident. With cobaltous oxide it is scarcely perceptible without heat and long continued action.

Action of Ferric Chloride on Metallic Silver.—It has been long known that silver was blackened by ferric chloride, and this action has been proposed in the textbooks as a means of obtaining subchloride, for which it is quite unsuited.

Ferric chloride acts on silver much as sodium hypochlorite does, but less rapidly. With hypochlorite the action is complete in a few hours or often in an hour or less; with ferric chloride one or two days are required before the product ceases to yield silver to hot dilute nitric acid. In both cases the action appears to be alike in this: that no subchloride is finally left uncombined with normal chloride.

The product is an intensely dark purple-black, when the action takes place in the cold. With heat continued for many hours, ferric chloride can be made to attack the purple salt and gradually convert it into Ag Cl. With a strong solution in large excess kept at or near 212° Fahr. for sixty hours the colour was gradually reduced to pink and finally to a dingy pinkish grey. Pure white cannot be obtained, as it can by aqua regia.

In order to observe more exactly the course of the action, a strong solution of ferric chloride was allowed to act on reduced silver in fine powder for four minutes, and then a fresh portion (always in large excess) for the same time. Analysis showed that at this stage of the action the material contained:—

Ag (determined).....	76.07
Cl (by difference)	23.93
	100.00

If we suppose that all the silver was combined with chlorine, the constitution of the substance would be:—

Ag Cl	92.49
Ag ₂ Cl	7.51
	100.00

But this was probably not the case; there was almost certainly free silver present and consequently a less proportion of subchloride. Another specimen, treated repeatedly with hot acid until every trace of free silver was removed, was found to contain 1.52 per cent. of subchloride, colour purple. Another similarly treated contained 7.3 per cent. subchloride.

Action of Nitric Acid on Silver Subchloride.—When freshly precipitated and still moist subchloride of silver is treated with nitric acid, a sharp effervescence accompanied with a disengagement of red fumes, sets in; presently the strong red colouration of the photochloride appears and the action ceases. This production of the red and not the white chloride in the decomposition of Ag₂ Cl is precisely what might have been expected, for when Ag Cl is formed in the presence of Ag₂ Cl more or less combination always takes place.

The action is interesting in this respect: the Ag Cl first formed is at the moment of formation in presence of all the yet undecomposed portion of Ag₂ Cl, and whatever part it combines with is removed from the action of the acid. It would therefore seem probable that this method would be one of those that yielded a product having the largest proportion of Ag₂Cl, but analysis showed that different specimens were extremely variable—of those analysed, one contained 8.62 per cent. of Ag₂ Cl, another 6.56, and a third 1.96. All that analysis can do with such substances is to fix the limits within which they vary. The quantity of subchloride left after treatment with nitric acid depends partly on the strength of the

acid and the time for which it is allowed to act, but also to some extent on variations in the resistance of the substance itself. These specimens were of shades between rose and purple.

The colour of any particular specimen is always lightened in shade by abstracting Ag₂ Cl from it by continued boiling with nitric acid. But as between different specimens, especially when formed by different reactions, it by no means follows that the darkest in colour contains the most subchloride.

Argentous chloride when treated with sodium hypochlorite yields a purple form of photochloride. A specimen so treated contained 2.57 per cent. of Ag₂ Cl.

Action of Cupric Chloride on Silver.—When metallic silver is submitted to the action of either cupric chloride or, what gives the same result, a mixture of copper sulphate and ammonium chloride, an action takes place very similar to that of ferric chloride, but more energetic, and the resulting red chloride is apt to be lighter in shade, though in this respect it varies very much. As in the case of ferric chloride this action of cupric chloride on silver is given in some textbooks as a means of obtaining argentous chloride, for which purpose it is a little suited as the iron salt.

As a mode of obtaining red chloride it is not to be recommended. It is troublesome to get the copper completely removed. A specimen analysed was found to consist of white chloride with 6.28 per cent. of subchloride.

Action of Protochlorides on Silver Solutions.—*Cuprous Chloride.*—When very dilute solution of silver nitrate is poured over cuprous chloride, a bulky black powder results, which by boiling with dilute nitric acid turns red, the acid extracting little or no silver.

Ferrous Chloride.—When silver nitrate is dissolved in a slight excess of ammonia, and this solution is poured into a strong one of ferrous chloride, there results a precipitate which is sometimes greyish, sometimes olive black. By washing with dilute sulphuric acid, this product becomes brownish purple, and brightens by boiling with dilute nitric acid. It was found to contain 4.26 per cent. of subchloride.

Photochloride by Action of Hydrogen.—When hydrogen is passed over argentic citrate at 212° Fahr., as in Wöhler's process, there results a black or dark brown powder consisting of argentous citrate, metallic silver, and perhaps other substances. When this is treated with hydrochloric acid and subsequently with nitric, the resulting product is photochloride, the characteristic colour of which sometimes appears as soon as the H Cl is added. But more frequently the material after the action of H Cl has precisely the appearance of silver reduced in the wet way, and the red colour appears only after treatment with nitric acid. Even cold dilute acid (by some hours' contact) will isolate the red chloride; boiling acid does so at once.

Colour, beautiful purple. A specimen analysed was found to consist of normal chloride combined with 3.11 per cent. of subchloride.

Photochloride by Action of Potash with Oxidisable Organic Substances.—There is no better method of obtaining photochloride than by acting on a salt of silver with potash and certain organic substances. Milk sugar, dextrose, and aldehyde, give particularly good results. Milk sugar acts rapidly, dextrose slowly. Other substances with which, combined with potash, I have obtained chloride, are:—Gum, tannin, galloannic acid, manna, glycerine, alcohol, carbolic acid, &c. The number might, doubtless, be indefinitely multiplied. After the action has reached a proper stage, which with milk sugar is apt to be in less than a minute, and with dextrose may take half an hour, H Cl is added, whereupon the precipitate changes in appearance, but does not exhibit its characteristic colour until after boiling with nitric acid; the best result is obtained when the precipitate, after addition of H Cl, has a rich chestnut brown shade,* which by nitric acid changes to shades of purple and burnt carmine, when milk sugar, dextrose, or aldehyde has been the reducing agent. When the salt of silver employed has been the chloride, of course treatment with H Cl is superfluous.

A specimen, obtained by acting on silver nitrate with potash and dextrose, was found to contain 2.26 per cent. of subchloride. Another, obtained with silver nitrate, potash, and milk sugar, contained only 0.34 per cent. As in former instances, these determinations are useful only in indicating the extreme variability of these substances and their approximate limits of composition.

Other Reactions Leading to the Formation of Photochloride.—A few more instances are here added, indicating the variety of ways in which this product may be obtained.

The following is an interesting reaction:—If a solution of ferrous sulphate is made strongly acid with H Cl and solution of silver nitrate added, the silver is thrown down as white chloride. But if to the silver solution is first added a little ammonia, enough to redissolve the oxide, but much less than enough to neutralise the acid added to the iron solution, then on pouring the silver solution into the iron the silver falls as red chloride. So obtained, it has at first a dull purple or shade, but by purification, as before described, a good product is obtained. This method, however, scarcely tends to the production of the splendid copper red shades of colour that are got by acting on silver chloride dissolved in ammonia with ferrous sulphate, and then adding dilute sulphuric acid. The shade of colour shown by any particular specimen is always of

* A specimen in this stage, and before treatment with nitric acid, was found to contain 82.68 per cent. of silver, showing it to be a mixture of metallic silver with chloride and subchloride.

* Concluded from page 332.

interest, because, as before mentioned, it modifies the effect exerted upon it by the spectrum.

Potassio-ferrous Oxalate.—The now well known "oxalate developer," which I described in this Journal some years ago, throws down from silver nitrate a black powder; this precipitate treated with H Cl scarcely alters in appearance, but washed and boiled with dilute nitric acid changes to a deep purple.

Pyrogallol is capable of leading to the formation of photochloride. When ammoniacal solution of silver nitrate is poured into solution of pyrogallol in water made strongly acid with H Cl, in such proportion that the mixed solutions remain strongly acid, there falls a greyish product, which by washing and treatment with hot dilute nitric acid becomes bright pink.

Ferrous Oxide differs essentially in its action on silver solutions from ferrous sulphate. A silver nitrate solution added to one of ferrous sulphate precipitates grey metallic silver. But if potash or soda is first added to the ferrous solution, and then silver nitrate, followed by H Cl, the red chloride is formed abundantly. This reaction is similar to that already described, in which an ammoniacal solution of a silver is added to one of ferrous sulphate.

To the same class of reactions belongs the following: Silver carbonate with excess of sodium carbonate is thrown into solution of ferric sulphate, and after standing a few minutes H Cl in excess is added. The silver is converted into red chloride.

It seemed possible that silver itself might be made the means of reducing its chloride. The experiment was made in this way: Freshly precipitated and still moist chloride was intimately mixed with metallic silver in fine powder and a little water. This was heated till the water boiled and nitric acid was added. After the action was over the chloride had assumed a deep pink colour. A similar result is obtained without the aid of heat, but the resulting colour is much paler.

Analogous to this is the following: When a cake of fused silver chloride in a crucible is reduced with dilute sulphuric acid and zinc, if the reduction is interrupted when not quite finished, and the metallic silver is dissolved out with hot nitric acid, the residue of silver chloride will be found to be pink.

When H Cl is brought into contact with Ag together with an oxidising agent, such as a bichromate or permanganate, it gives rise to formation of coloured chloride. These I have not specially examined, but there can be little doubt that they are identical in nature with the foregoing. So, too, when silver in contact with mixed potassium chloride and chlorate is cautiously treated with dilute sulphuric acid.

The reactions above described will serve to show under what a vast variety of conditions the photosalts are formed. Most of the methods here described represent each a whole class of reactions, all resulting in the same general way, and these classes might doubtless be largely added to. Almost any silver solution brought into contact with almost any reducing agent, and then treated with H Cl, gives rise to the formation of photochloride. Almost any chlorising influence brought to bear on metallic silver has the same result, or when silver is brought into contact with almost any oxidising agent and H Cl. It may be said without exaggeration that the number of reactions that lead to the formation of photochloride is much larger than that of those leading to production of normal chlorides.

Reactions of Photochloride.—Exposed to ordinary diffuse light all the bright shades of silver photochloride quickly change to purple and purple-black. The darker shades are more slowly influenced.

Mercuric chloride gradually changes it to a dirty white. Mercuric nitrate dissolves it easily and completely, but apparently with decomposition, as it can only be recovered as white chloride. Potassic chloride seems to be without effect.

Potassic bromide soon converts it to a dull lilac, which at the end of twelve hours showed no further change.

In contact with potassic iodide the colour instantly changes to blue-grey; this change is produced by a quantity of iodide too small to dissolve even a trace of silver; the filtrate is not darkened by ammonium sulphide. With a larger quantity silver is dissolved abundantly. By acting with renewed iodide solution, the substance continually darkens and diminishes until only a few black points, barely visible, are left.

Treated with dilute solution of potassium chlorate and H Cl, the red substance gradually passes to pink, to flesh colour, and, finally, to pure white.

The action of heat on the photochloride is very curious; its tendency is generally toward redness. Specimens appearing quite black are rendered distinctly purple or chocolate by heating to 212° Fahr. in a drying oven. Often when the substance first separates by addition of H Cl, it is pure grey; this grey will often be changed to pink by simply heating to 212°. (This happens when a gray form is produced; if the greyness is due to admixed metallic silver, it is only removed by boiling with nitric acid.)

The somewhat surprising change of colour which is often seen when the crude substance is boiled with nitric acid (sometimes from dull, dark grey to crimson) is due to three concurrent actions: that of the mere heat, the removal of the silver, and the breaking up of uncombined subchloride.

It is not possible to dissolve out the normal chloride by a solvent like ammonium chloride from the photochlorides, leaving the subchloride

behind. When red chloride is boiled with successive portions of strong solution of ammonium chloride in large excess, the material gradually diminishes until, if the operation is continued long enough, there remains a small residue of a warm grey colour, which consists of metallic silver, and dissolves without residue in nitric silver.

If sodic chloride is substituted for ammonium chloride, the same result follows, except that the operation is greatly more tedious. If persevered in until the hot solution no longer removes traces of silver chloride, the residue consists of nothing but metallic silver.

Action of Light on Normal Silver Chloride.—When silver chloride precipitated with excess of H Cl is exposed to light, it becomes with time very dark. Cold, strong nitric acid 1.36 s.g. extracts a trace only of silver.

The principal action of light on Ag Cl (precipitated in presence of excess H Cl) consists in the formation of a small quantity of subchloride, which enters into combination with the white chloride not acted upon, forming the photochloride, and thus is able to withstand the action of strong nitric acid. At the same time a trace is formed, either of metallic silver or of uncombined subchloride, it is impossible to say which. After a certain very moderate quantity of photochloride is formed, the action of light seems to cease. The cessation has been noted by many observers, perhaps most exactly by Dr. Spencer Newbury.

The nature of the product formed by the continued action of light on silver chloride seems to support the conclusion that the subchloride is combined with the whole of the normal chloride after the manner of lakes rather than in equivalent proportions. If the latter were the case, it seems probable that the continued action of light would extend to much greater decomposition than it is found to do.

The action of light in the formation of the so-called latent image will be examined in the second part of this paper.

PHOTOBROMIDE AND PHOTOIODIDE.

It has been already mentioned that bromine and iodine form with silver combinations in all respects analogous to those of chlorine. A more particular account of the bromine and iodine compounds must wait for the next succeeding number of this Journal; here it can only be mentioned that these substances are formed much in the same way as the chlorine compound. They are less stable than it, and consequently the number of reactions that lead to their production is somewhat more limited. Each, however, is formed in a great variety of ways, and with the same ease as the chloride. In colour they are for the most part indistinguishable from it, but exhibit different reactions.

RELATIONS OF PHOTOCHLORIDE TO HELIOCHROMY.

The photochloride was examined both with the spectrum and under coloured glass. The rose-coloured form of photochloride was that which gave the best effect. In the violet of the spectrum it assumed a pure violet colour, in the blue it acquired a slate blue, in green and yellow a bleaching influence was shown, in the red it remained unchanged. The maximum effect was about the line F, with another maximum at the end of the visible violet, less marked than the one at F.

Under coloured glass the colours obtained were brighter; under two thicknesses of dark ruby glass the red became brighter and richer. Under blue glass some specimens gave a fair blue, others merely grey. Under cobalt a deep blue was easily obtained, and under manganese violet, a fine violet, very distinct in shade from the cobalt. Green produced but little effect—yellow was sometimes faintly reproduced but rarely. But the yellow glass of commerce, even the dark yellow, lets through portions of nearly the whole spectrum, as can readily be seen by testing it with the spectroscope.

The dark purple forms of chloride do not give as good results as the rose and coppery shades. These last have many points of resemblance with the material of Becquerel's films, resemblance of colour, probably of composition, as far as we can judge of the constitution of those films from their origin—they were far too attenuated to admit of analysis, and resemblance in the curious way in which their colour is affected by heat, so that the conclusion seems inevitable, that they are at least closely related.

There is certainly here a great and most interesting field for experiment; hardly any two specimens of photochloride give exactly the same results with coloured light, and this suggests great possibilities. There is the very great advantage in this method over any previous, that the material is easily obtained in any desired quantity, and in a condition most favourable for experiment.

The action of light on photochloride can be a good deal affected by placing other substances in contact with it. Any substance capable of giving up chlorine seems to influence the action somewhat; ferric chloride often acts favourably, also stannic and cupric chlorides.

Evidently an important point in all heliochromic processes is that as white light must be represented by white in the image, it is an essential condition that white light must exert a bleaching action on the sensitive substance employed. Red chloride does not bleach but darkens in white light, but the property of bleaching, to a very considerable extent, may be conferred on it by certain other chlorides, and particularly by lead chloride and zinc chloride. This I look upon as very important.

Another matter of interest is exaltation of sensitiveness, and this I find is accomplished in quite a remarkable way by sodium salicylate, the presence of which at least trebles the action of light on these substances. And probably on others.

I am persuaded that in the reactions which have been here described lies the future of heliochromy, and that in some form or other this beautiful red chloride is destined to lead eventually to the reproduction of natural colours.

M. CAREY LEA.

—*The American Journal of Science.*

WHERE I WENT WITH THE CAMERA.

NO. VII.—COLOGNE AND BRUSSELS.

LEAVING Berlin I came on to Cologne. After the cathedral, the bridge of boats, and one or two other stray subjects, I did not find much photographic work here. The streets generally are narrow and winding, and most of the houses are not well built.

The cathedral as a fine subject is known all over the world, both for its extent and its beauty. The time it has taken to build is also a very general part of the conversation when talking of this charming Gothic edifice. It was begun about 1250, and is not yet finished. It is shrewdly suspected that those interested are in no hurry to have the work completed, for it must be a considerable revenue to the church showing it off as it is, and demanding fees for everything to help to finish the good work. A franc to see the relics, a franc to go up the towers, a franc for this and a franc for that all over the place. It means a lot of money, for it is a good show and is always well attended. I did the mounting of the tower, but the day was lazy and unpropitious.

The Hotel du Nord, at which I stayed here, was certainly the best appointed and best all round house of any hotel on my route. I got one or two very good negatives from my bedroom windows.

It is stated that there are over thirty manufacturers of the genuine Eau de Cologne established in this city. That manufacture must be a pretty open secret.

One of the prettiest sights I saw in Cologne was the market-place in the morning, filled with busy life and bright, shifting colours. The square looked like a scintillating gem in a dark setting. I got a picture of the scene—a very pleasant memory.

I next came to Brussels, which is a very beautiful city, and, from a photographic point of view, one that would do your heart good to see. Streets, squares, promenades, and handsome buildings in abundance and to choose from. I found quite a number of studies in the market-place, in which is situated the Hotel de Ville or Town Hall, a very old but handsome building forming one side of the square. This hall is rich in relics and curiosities, and is open to visitors at a charge of half a franc. One thing that is pointed out particularly to the visitor here is the painting of a female on the roof of one of the state rooms. She has a trumpet to her mouth, and no matter where you turn, or what part of the room you go to, the figure seems to turn also, and the trumpet is always towards you. The effect is rather startling, the whole body seeming to alter in position as you walk round.

The tower of this hall is 360 feet high, and one of the grandest panoramas imaginable is obtained from the top. I got some good general views from this tower. Away up in this place, far above the noise of the seething city, a boy sat waiting to take the tickets from visitors when they came up. I suggested to him that his must be a very solitary life up there; but he had got quite used to it, and sat there reading hour after hour, perfectly satisfied with the monotonous occupation. On the Sunday morning I saw a novel sight in the market-place. This was a bird-market. Birds of all kinds in cages being bartered and sold—thousands on thousands of birds holding high concert as the sellers did a busy trade. This market is allowed a certain number of hours on the Sunday morning; when the time is up it is cleared. When the hour comes for closing it seems as if a magic wand had been passed across it, for presto! change! and the square is empty almost in a minute.

On this same Sunday I visited the Church of St. Gudule. When listening to the service there you may guess my surprise when a man came up to me and tended me his business card and asked me if I would be good enough to go and see the lace factory, that it was only a short distance from the church and well worth seeing. This is pushing business and no mistake, thought I. It was almost as bad as the Yankee who offered to supply a congregation with hymn-books free if they would allow him to put his "bat" advertisement on the fly-leaf.

The Palace of Justice in this city stands out as an edifice unique and alone, both as regards position and magnificence. In the midst of hundreds of splendid and beautiful buildings this palace towers above them all.

When in this city I visited the Wiertz Picture Gallery. It is not much talked about, but, knowing something of the life of the artist, and the eccentric form of his genius as displayed in his works, which for size, conception, and execution are most wonderful, I had a great desire to see it. Wiertz seems but to have had one concentrated passion all through his life—from his earliest boyhood up, and that was to attain glory, to gain a fame that would live for centuries. His father used to delight to dwell upon this theme, and the boy hearing it desecrated on and magnified from every point of view, it became a second nature to him, and renown became the object of his life. When other children were only thinking of toys, Wiertz was covering his copybooks with crayon drawings, or carving out all sorts of grotesque figures with his pocket-knife. On one occasion he carved a frog so true to nature that at first sight it seemed a living thing. The chief of police when visiting his father was shown this frog, and it

astonished him so much that he talked about it everywhere. This trivial incident decided his fate, for this story of the frog coming to the ears of M. Paul Maibe, a gentleman much interested in art subjects, visited the child and was charmed with him. He took him to his house, and afterwards sent him to school; he also gave him lessons in drawing. At the age of fourteen he was sent to be taught sculpture, drawing, carving, and engraving. At Antwerp he studied under Herreyns and Van Bree. In 1821, when he was but fifteen years of age, King William gave him a pension of 140 florins, rising to 300 florins a-year. This good service also was due to the kind representation of M. Paul Maibe. On this income, averaging 200 florins a-year, he managed to live, and, following the counsels of his father, he allowed himself no relaxation, but worked steadily and unceasingly on to the one point—to be a great painter. At the age of twenty, when recommending a pathway in life to young painters, he said, "In a time when mechanism is preferred to expression, you must have the courage to imitate the great Poussin, to paint for posterity, and struggling against the bad taste of the time know how to remain poor in order to know how to become great," adopting this stoical idea for himself. Some time after he wrote a friend, "To paint pictures for glory, and portraits for pot-boilers, is the occupation of my life."

In 1828 he competed for the prize of Rome, and in 1832 he was crowned. Now he could visit Italy; now he could study the great masters; now he could plan a work for himself. He wished to measure himself with Rubens or Michael Angelo. For his subject he went to Homer's *Iliad*—at this time he lived in the country of Homer, and revelled in his works—the outcome of which was his first great work, a picture thirty feet broad by twenty feet high, entitled *Patroclus—the Greeks and Trojans*. In six months it was finished and exhibited in Rome. Old Thurlowaldsen, when viewing the picture, exclaimed, "This young artist is a giant." This picture astonished the art world. The journals wrote him up, and the Art Society of Antwerp offered Wiertz a banquet; but the glow of this first dawn of glory was not broad enough for him, he had not yet reached the height he wished to attain. So he resolved to send his large picture to Paris. But, alas! at this time misfortune seemed to follow him. The picture only missed being seized by the Custom House officers, then it got storm stayed, and reached Paris too late to be in time for that year's exhibition. He got it in the following year, 1839, and it was placed in the Salon of Honour; but it was hung so high, and in such a bad light, that the subject could not be made out by any one. This failure made him begin to despair; for a little he seemed to doubt his genius, but only for a little, for shortly after this we find him at Brussels looking round for some place large enough to hold the size of canvas he wanted to paint. He was unsuccessful in his search for a long time. At last he came upon an old, empty mill that he turned into a studio. In this place he painted that picture which placed him in the first rank of the artists of his country—*The Triumph of Christ*. The size of this picture was forty feet by twenty-five feet. The grandeur of the conception, and the style and treatment of the subject, were considered entirely new. He lived to paint. The necessities of life only did he allow himself; idleness was unknown to him. He painted portraits to live, he painted pictures for posterity. In 1850 he had seven large pictures. The Minister of the Interior offered to build him a studio large enough to hang these, and space for his future works on condition that these seven pictures would be the property of the State, and that future works would be bought as arranged. He agreed. A building vast in size was completed and the pictures placed in it. Now had he attained what he had so long desired, and in his new studio he settled down to realise the dream of his life—the glory of a name. Shortly after this he invented a new medium for painting—a kind of flat or matt oil paint. Pictures painted by it could be seen in any light, as it had neither glaze nor reflection. He published the details, and other artists have made pictures by the process with marked success.

In the midst of mighty unfinished projects, and with a seeming glorious future before him, Wiertz passed away. He was only a few days ill. At first the doctors did not anticipate anything serious; but he grew gradually worse, and died on June 18, 1865, being fifty-nine years of age.

His last deposition was written by himself, and was very concise, thus:—

"I nominate my friend, Charles Potvin, my sole legatee."
But his friend knew exactly what he wanted done, and he faithfully attended to it. He was to offer the collection of pictures to the Government on the conditions that the collection was never to be broken up nor sold, but to be kept in its entirety as the Wiertz Gallery, and if they accepted his conditions he committed himself to the good faith of his country.

The terms were accepted, and the gallery is now one of the national institutions, and we, the visitors, are the posterity Wiertz dreamed of.

If in this city, do not miss seeing this collection of pictures.

MARK OUTE.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

The local Committee held a meeting at Glasgow on May 26. Mr. John Sturt, Chairman of Committee, presided. Final arrangements were made for the Convention meeting on July 4.

It was arranged to hold evening meetings from Monday to Friday inclusive, with the exception of Thursday night, which will be left free. Six excursions were agreed upon, giving a choice of two on Tuesday and two on Wednesday, leaving one for Thursday and one for Friday.

The details of these meetings and excursions will be given in a programme of the week's proceedings. This programme will be in the hands of members of the Convention some time before the meeting.

Attention is directed to the circular issued by the Exhibition Committee.

The importance and success of the Exhibition is already assured by the number of requests for space sent in by professional and amateur members of the Convention, and every member who possesses anything whatever of interest to the craft should take this excellent opportunity of exhibiting.

The following is the circular alluded to:—

"PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

"At Glasgow, week commencing July 4, 1887.

"EXHIBITION.

"The Exhibition Committee issue the following information to intending exhibitors:—

"1.—The Exhibition shall form part of the Convention meeting; is not competitive or public in its character, and is intended for members and their friends only.

"2.—The Exhibition is intended to include every class of photographic work and apparatus, and exhibits are requested from any member, whether professional, amateur, manufacturer, or dealer. Members are solicited to show anything whatever of special interest, whether old or new.

"3.—Exhibitors must be members of the Convention.

"4.—The Committee will be ready to receive exhibits on 14th June, and not later than 24th June.

"5.—All packages to be addressed 'Photo. Convention, Institute of the Fine Arts, 175, Sauchiehall-street, Glasgow.'

"6.—All forwarding charges to be prepaid by the sender.

"7.—Exhibitors are requested, on forwarding goods, to advise the Local Secretary, and to enclose address label for return.

"8.—Exhibitors are requested to attach to all exhibits a card, describing process, &c., and giving name of exhibitor. These cards to appear in a prominent position, as it is not intended to prepare a catalogue.

"9.—For the convenience of exhibitors at a distance from Glasgow, the Committee will repack and forward goods after the meeting.

"10.—Local exhibitors are requested to remove their exhibits within three days after the close of the Convention.

"11.—The Committee will take every reasonable care of exhibits, but they cannot undertake any responsibility for loss or damage.

"JAMES DAVIE, Hon. Local Secretary,

"36, Darnley-street, Pollokshields, Glasgow."

Our Editorial Table.

GUIDE TO THE SCIENCE OF PHOTO-MICROGRAPHY.

By E. C. BOUSFIELD.

London: Kent, Paternoster-row; and Sharland, Thavies Inn.

In this *brochure*, which contains sixty-nine pages, Mr. Bousfield very skilfully and ably goes into the practical details of photo-microscopy, treating all departments fully without being prolix. For the ordinary run of work he thinks that as to the source of light there is nothing at all equal to a good paraffine lamp with a flat-flame burner, although the more intense illuminants are not ignored.

Accompanying the pamphlet we have received some photo-micrographs of *Amphiptera pellucida* over four inches in length, which show that Mr. Bousfield flies at high game. These, he informs us, were taken by the new apochromatic objectives, with, of course, their accompanying eye-pieces.

THE AMATEUR'S FIRST HANDBOOK IN PHOTOGRAPHY.

By J. H. T. ELLERBECK.

London: Hamilton, Adams, & Co. Liverpool: D. H. Cussons & Co. Manchester: Heywood.

The present is a new and enlarged edition of Mr. Ellerbeck's manual. We have read it through carefully, and have nothing but praise to bestow upon the pamphlet as a useful and carefully written guide to those who want a reliable first handbook.

HOW TO BE A SUCCESSFUL PHOTOGRAPHER.

By W. J. LANCASTER.

Birmingham: J. Laneaster & Son.

In the fewest words compatible with lucidity in directions Mr. Lancaster, after giving a description of the various classes of apparatus desirable or necessary (profusely illustrated), takes the student by the hand, as it were, and having conducted him to the dark room proceeds to make up the various solutions required in order to produce a negative. He then touches upon the subject of portraiture, both in the garden and in the house, and having shown his pupil how to take and develop them, and to guard against the

pitfalls which lie in the way of the beginner, gradually leads him on to instantaneous work, in connection with which the tricycle and bicycle are impressed into his service. The production of magic lantern pictures and transparencies also finds a place in his manual.

VARIOUS CATALOGUES.

Mawson & Swan, Newcastle, and 33, Soho-square, London.

THE first of a series of catalogues emanating from this firm which we take up is that appertaining to *Chemical Apparatus and Chemicals*. It is a somewhat ponderous one of 132 pages, copiously illustrated from beginning to end. Although many of our readers only know this eminent firm in connection with photographic appliances, yet will a perusal of this goodly catalogue quickly apprise them that they are not only dealers in and manufacturers of chemical instruments and chemicals of all sorts, but are so on a most extensive scale. A perusal of this noble catalogue is truly fraught with suggestion.

The next in the list of Mawson & Swan's catalogues is that of *Electric, Magnetic, and Physical Apparatus*. Like the former this is a compendium in itself, the subjects being those appertaining to electricity and its cognates. It is *en suite* with the other, and is pagged to bind up along with it and those which are to be forthcoming subsequently.

Microscopes and Microscopic Apparatus form the theme of another part of this series, and in this, in addition to microscope stands and objectives, we have appliances for collecting, mounting, and storing objects, together with the cabinets in which these are to be ultimately kept for ready reference.

Department for Inexperienced Photographers.

THE USE OF A SWING BACK TO THE CAMERA.

THERE are three uses which may be made of a swing back, and these we shall treat in turn.

To explain its application to architecture, let us suppose that a photographer plants his camera in front of a large building. On looking on the ground-glass, he finds that though the building is square, and otherwise unobjectionable, its upper portion has not been admitted on the ground-glass at all. He naturally will raise the lens as far as the sliding front of the camera will admit of its being done, but this proving insufficient to get in all the upper portion of the building properly, only one course remains, namely, to point the camera upwards till the desired end has been attained. By this means the whole of the edifice is now got on the plate. But it will be found that, as a consequence of this tilting up of the camera, the sides of the building, which previous to the tilting were vertical, are now seen to be converging like a ∇ inverted. In short, the building is distorted, the defect being designated as the *Distortion of Convergence*.

How is this to be remedied? We reply—By allowing the camera to remain undisturbed, but by means of the swinging back bringing the ground-glass in a strictly vertical position, so that, in fact, it is once more brought into parallelism with the vertical plane of the building. All distortion has now disappeared.

A convenient way by which the back can be rendered vertical, after the camera has once been placed, is to have a bit of thread with a small weight at the end, which when hung at the edge of the ground-glass acts as a plummet, and permits of the back being brought into correct position with speed and accuracy.

But seeing the plate is now standing obliquely to the axis of the lens, the upper part being nearer the lens than the lower portion, it follows that both top and bottom cannot be equally sharp in focus at the same time. This is most readily noticed when a large aperture is applied; but by inserting a small diaphragm the discrepancy is obviated, and all parts are practically made alike sharp. This distortion of convergence is more likely to be noticeable when lenses of wide angle are employed, and, therefore, when using such instruments exceptional care is necessary.

The swing back is also useful, and frequently necessary, in pure landscape work. All good landscapes should, if at all possible, have some salient objects in the foreground, which may consist of shrubs, flowers, stones, grass, weeds, or any of the innumerable objects to be found in nature.

When the view is focussed, and everything harmoniously arranged on the ground-glass, it will be found that the foreground objects, which if well selected should impart such a charm to a picture, are hazy from being more or less out of focus.

This arises from their vicinity to the lens, contrasted with the greater distance at which the other features of the landscape are situated, and by the law of conjugate foci, of which we spoke in the antecedent chapter

of this series of articles, both cannot be equally sharp on a plane at right angles to the axis of the lens. Therefore, in order that the foreground objects shall be brought into perfect sharpness without interfering with that of the distance, it is requisite that the ground-glass shall be swung back, in quite the opposite direction to that which was necessary in the case of architecture. The top of the ground-glass, on which the shrubs in the foreground are delineated, is now further from the lens than the bottom, the result being that both the foreground and the distance are alike sharp.

It is true that by employing an exceedingly small diaphragm the same end would be attained, but to do so the aperture would be unnecessarily reduced, which would be fatal to quick exposures.

The longer the focus of the lens that is employed in landscape work the more necessary that a swinging provision is made for securing the utmost sharpness of the foreground.

A third use of a swing back is when a portrait lens of large dimensions is employed in the production of a portrait of a sitting figure, especially when the camera is at no great distance from the sitter. The hands, if resting on the knees, together with the knees themselves, are under such circumstances not quite so sharply defined as the face, necessitating a slight swinging of the back to bring them into equality as regards sharpness.

Incidentally we may remark that when copying an architectural picture that has been distorted by the convergence of the perpendiculars, these may be rendered quite rectilinear in the copy by swinging the back, and thus introducing enough distortion of an opposite character to counterbalance that of the distorted photograph which is being copied. The result, as we have hinted, is perfect rectilinearity in the copy thus obtained from a distorted original.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 7549.—“Improvement in Metallic Easel or Stand for Photographs, Cards, and other like Articles.” J. DEAKIN.—*Dated May 25, 1887.*

No. 7737.—“An Improved Method and Apparatus for Photographic Printing.” J. HARRINGTON.—*Dated May 27, 1887.*

PATENTS COMPLETED.

IMPROVEMENTS IN FRAMES FOR DISPLAYING PHOTOGRAPHS, ADVERTISEMENTS, AND THE LIKE.

No. 13,783. WILLIAM MOFFATT, Millfield-terrace, Hexham, Northumberland, and WALTER SCOTT, Wanlockhead, Lanarkshire.—*October 27, 1886.*

THE improved frame under our invention is designed for displaying in rotation a series of photographic views or portraits, advertisements, and the like, and it consists of an ordinary portable picture frame or stand supported in an inclined position by a hinged or other bracket, and having suspended within it a box containing the series of photographs or other announcements, said box being capable of rotation upon a horizontal axis, and when in its normal position of rest replacing the “picture,” which is ordinarily held stationary in the frame. The upper and under sides of the box have each two or more openings formed in them, through which openings the views to be displayed are seen and the views themselves are fitted in “slides” or shifting frames, which are placed in the box in two tiers, one tier loosely filling the box to the extent of half its length and the second tier partially filling the remaining half length or division of the box, a space equal to the depth of one of the sides being left by using an odd number of slides, so that the slide which for the time being is uppermost may be shifted from one end of the box to the other. The slides or shifting frames each contain two views or announcements placed back to back, so that in whatever position and order the slides may be placed in the box there are two views displayed at one side of the box and another two on the opposite side. In order to display in rotation the different views or announcements contained in the slides, the box is rotated intermittently by the use of a hand crank or otherwise, and it is brought to rest with one side in the same plane as the front of the supporting frame or stand by means of flattened discs, ratchets, or similar devices formed on a spindle, by which the box is suspended from bearing brackets on the back of the frame. On each movement of the box through half a revolution, the slide which is at the lower end of the box, and is on the top of the highest tier when the box assumes a horizontal position, is shifted or falls by its own weight to the opposite end as the box is turned over, and while by this movement it covers one of the views previously displayed it uncovers a slide containing a fresh view. When the box is again turned a like shifting of one slide from one tier to the other takes place, and by continuous turning of the box the whole of the views are in rotation shown at the front of the frame.

THE London Stereoscopic Company purpose holding their Third Annual International Amateur Photographic Exhibition in October next, when a sum of £50 in cash and a number of gold, silver, and bronze medals will be offered as prizes. The whole of the entrance fees will be given in full to the Photographers' Benevolent Association. All particulars relating to the Exhibition can be obtained by application to the Company's Secretary, 108 and 110, Regent-street, London, W.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
June 6	Notts	Institute, Shakespeare-street.
“ 7	Coventry and Midland	Coventry Dispensary.
“ 7	North London	Myddelton Hall, Upper-st., Islington
“ 7	Glossop Dale	Society's Rms., Norfolk-sq., Glossop
“ 7	Holmfirth	
“ 7	Sutton	Society's Rooms, 18, High-street.
“ 7	Sheffield	Masonic Hall, Surrey-street.
“ 7	Bolton Club	The Studio, Chancery-lane, Bolton.
“ 8	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
“ 9	Birkenhead	Free Public Library, Hamilton-st., G.
“ 9	Bradford Amateur	Grammar School.
“ 9	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

At a meeting of the above Association, held at the Masons Hall Tavern, City, London, on Thursday night, May 26, Mr. Herbert Starnes presided.

Mr. F. W. COX exhibited prints upon Fry's bromide paper; he said that they differed in type from those upon Eastman's paper.

Mr. A. MACKIE remarked that Eastman's paper was best for thin negatives.

Mr. W. H. PRESTWICH exhibited some views taken by Professor Stebbing, of Paris.

Mr. L. MEDLAND exhibited a shutter invented by Newman, which he considered to be about the most perfect obtainable; it was one which gave the power of regulating the length of the exposures.

Two members exhibited some not very successful views of the Derby.

Mr. C. HEINRICH TRINKS exhibited a Beck's lens with iris diaphragm.

Mr. J. J. BRIGINSHAW asked the nature of halation and how it could be cured.

Mr. COX responded that for the most part it is an optical effect.

Mr. W. M. ASHMAN stated that Mr. F. W. Edwards had said that it could be cured by coating the ground side of ground-glass with the sensitive emulsion.

Mr. W. E. DEBENHAM was surprised to hear that statement, because the indices of refraction of gelatine and of ground-glass are so nearly alike.

Mr. A. COWAN remarked that halation is most prominent in under-exposed pictures forced in development, all other conditions being equal.

THE CHAIRMAN asked if any one present knew anything about an alleged discovery by Mr. Mayall of a process for photographing in natural colours.

THE HON. SECRETARY thought that Mr. Woodbury had once professed to do something of the kind.

Mr. DEBENHAM: Never. Hitherto Frenchmen only have introduced coloured photographs as photographs in natural colours.

Mr. COWAN thought, from what he could gather from newspaper reports, that coloured photographs would be the proper name for Mr. Mayall's new productions.

Mr. J. B. B. WELLINGTON read from *Nature* a paragraph about what he called “real” experiments on photography in natural colours by Mr. Carey Lea. That paragraph was printed in these pages last week.

Mr. W. H. HARRISON said that in early days photography in natural colours had been brought to a fair degree of perfection by Niépce de St. Victor, Becquerel, and others. At the first International Exhibition in Hyde Park about 1851, were some photographs of the spectrum taken by Niépce upon silver plates, and which were exhibited in subdued light. Mr. Warren De la Rue purchased one, and about fifteen years later exhibited it to him (Mr. Harrison) at Cranford. It was kept in a leather case, and was only opened occasionally in subdued light for the inspection of the curious, the difficulty being to thoroughly fix this class of photographs. A few months ago, when Mr. De la Rue was at Hamburg, he, in the course of some correspondence, asked him as to the condition of Niépce's photograph of the spectrum, and was informed that it is still in as good condition as ever. It is a very fair photograph of the colours of the spectrum, taken upon a silver plate chlorised by means of an electrical current while the plate was immersed in a bath containing various chlorides. If Niépce were allowed to dress a doll in what colours he pleased he could somewhat faithfully reproduce its colours in the camera image. Metallic objects came out with metallic lustre by this process; thus gold would look like metallic gold in the photograph, and not merely a yellow colour. Mr. Traill Taylor had informed him that Niépce fixed such photographs to a greater extent than many persons imagined.

Mr. TRINKS remarked that Niépce had found dextrine useful when producing photographs in natural colours.

Mr. MEDLAND asked if any one had seen a remarkable photograph by Van der Weyde at the American Exhibition of Mary Anderson, which stood out in such relief that many persons believed it to be a statue.

Mr. WELLINGTON stated that it was in a semi-dark room, spectators were not allowed to go near it, and were considerably limited in the selection of their point of view; it was inspected direct, and not through any optical device. A friend of his still believed it to be a statue.

Mr. COX suggested that an opera-glass would be useful in the inspection thereof.

Mr. TRINKS asked what was the greatest speed of shutter most generally useful for practical purposes.

Mr. DEBENHAM with a lens at $\frac{1}{4}$ aperture had given one-thirty-fifth of a second exposure from beginning to end of the opening of the shutter, equal to one-seventieth of a second of the full aperture of the shutter. These measurements had been made for him by his friend Mr. Haddon.

Mr. TRINKS remarked that it was impossible for the human eye to detect any movement more rapid than one-sixtieth part of a second.

Mr. DEBENHAM said that a flash of lightning passed in infinitely less than one-sixtieth of a second, yet could be seen by the eye.

Mr. WELLINGTON added that the eye could detect both the beginning and the end of the flash.

Mr. HARRISON was doubtful whether the shape of the flash did not convey the idea of the beginning and the end, rather than the actual motion.

Mr. A. L. HENDERSON had calculated, but was not sure, that when at a Derby race the horses were moving at the rate of sixty-five feet per second, the exposure he gave to take them as sharply as in the result could not have been more than one-two-hundred-and-fiftieth of a second.

Mr. DEBENHAM said that, accepting that estimate, if one-sixtieth of a second exposure had been given the horses would have moved slightly more than one foot, and that would have destroyed definition; the eye being fixed on the horses, and not on the background, might not notice the motion made in one-sixtieth of a second.

Mr. TRINKS, accepting Mr. Henderson's figures as to the length of the course and the time of the race, found by calculation that the speed of the horses was 49.59 feet exactly per second.

A question in the box asked if dextrine were good for mounting prints.

Mr. HENDERSON replied that it was not.

Mr. COWAN stated that it was too hygroscopic.

Mr. ASHMAN possessed prints mounted twenty years ago with dextrine and still as good as ever.

The meeting then resolved itself into a committee for the business affairs of the Association.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

At the meeting of this Society, held at the Greyhound Hotel, Dulwich, on Wednesday evening, May 25, Mr. A. Rider in the chair, Mr. MARSH read a paper on *Amateur Plate Making*.

Mr. Marsh went through the performance of the details of making an imaginary emulsion, using only a few ordinary household utensils for the work. The various stages of the process were accompanied with lucid directions and explanations. Mr. Marsh stated that a good emulsion can be made at an approximate cost of one penny per ounce, which quantity will coat six quarter-plates or one 10 x 8. Mr. Marsh also described the making of an emulsion by the ammonio-nitrate method, by which the trouble of washing is avoided. This process is so simple and cleanly that it may be performed in a sitting room. Some negatives were handed round which contained about a grain of silver in the film of each.

A cordial vote of thanks was given to Mr. Marsh for his highly interesting and instructive demonstration.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this Association was held on Thursday, the 26th ultimo, at the Royal Institution.—The President, Mr. George H. Rutter, in the chair.

The minutes of the preceding meeting were read and confirmed.

Mr. Charles A. Colman was unanimously elected a member of the Association.

The SECRETARY acknowledged the receipt from Mr. Cussons of a copy of the new edition of Mr. Ellerbeck's *Handbook on Photography*, also the photographic journals from the respective editors, and circulars of Pumphrey's glass-mounted films.

It was unanimously resolved that the recommendation of the Council, "That the Association do not think it expedient this year to join in the associated *soirée* arrangements," be adopted. A resolution was then moved and carried that the Association shall make arrangements for an exhibition and *soirée* of its own, and a committee consisting of Messrs. H. N. Atkins, Beer, Crowe, Lange, Mayne, Rutter, and Sayce, was appointed to draft a scheme for that purpose.

In the absence of Mr. Evans, Mr. RUTTER read a report of the excursion to Chester on May 7, from which it appeared that twelve members and two friends took part, that one hundred and nine exposures were made, fifty-nine on plates, forty-two on paper, and eight on Pumphrey's films.

Mr. RUTTER also, in Mr. Beer's absence, reported that on May 18 a full day excursion took place to Sandbach and Moreton. Eleven members were present, and one hundred and twenty plates were exposed. They went to Sandbach, thence to Moreton Old Hall, a very fine old timbered house, worth a whole day spent upon it, and returned to Sandbach. Dr. Kenyon exhibited a number of very fine enlargements on Eastman bromide paper from quarter-plate negatives taken on Eastman's stripping films during this excursion.

Mr. EARP read a short account of the excursion to Worsley and Wardley Halls on Saturday, May 21, when they photographed Drywood Hall, the old landing place on the canal, Worsley Court House, Church, and Old and New Worsley Hall, only six members taking part in the trip.

The discussion on *Detective Cameras* was then opened by Mr. PAUL LANGE, who exhibited and explained one of his own construction, in the shape of an innocent-looking brown paper parcel, containing quarter-plate camera, Ross' rapid symmetrical lens, Eastman's roller slide, with Roger's indicator and Kershaw shutter, thus forming a very complete instrument; also some specimens of very fine work done by its aid.

Mr. Driffield, of Widnes, showed his modification of Marion's Academy camera, consisting of the addition of a focussing mirror. The camera works plates two inches square, and some fine enlargements were shown from these plates.

Messrs. Swinden, Kerry, and Comber, also exhibited detective cameras showing slight variations, but generally on the principle of the brown paper parcel. Dr. Kenyon, and Messrs. Sayce, Tomkinson, Kerry, and Driffield, exhibited a considerable number of prints and other work.

Mr. Mayne exhibited Anderson's metal developing dish with attachment for lifting the plate out of solution; also Shew's folding rack for drying negatives, which shuts up into a very portable form.

A vote of thanks was passed to Mr. Driffield for coming over from Widnes to show his camera, and to the other exhibitors.

PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

At the meeting of the Society held on the 4th ultimo, Vice-President Bullock in the chair, Mr. BROWNE announced the death of Mr. James E. McClees, an old Philadelphia photographer, who was one of the pioneers in the art in Phila-

delphia, and was well and most favourably known to the older members. Mr. ELLIS and Mr. BELL also added tributes of respect to his memory, alluding to the freedom of access to his laboratory formerly enjoyed by amateurs, and the help he was always ready to give at a time when every new discovery was jealously guarded by most professional photographers.

The papers of the evening were by Mr. Rosengarten, on *Photographic Chemicals and their Technology*, and by Mr. Bartlett, on *Photographing by Gaslight* [see page 343].

Mr. Trask showed a series of seventeen cabinet photographs of prominent Philadelphia elergymen, also three composite photographs made from the series.

Mr. VAUX, alluding to statements which had been made that the so-called photographs of lightning flashes are in reality only pictures of the illuminated edges of clouds, showed a series of pictures he had made of sparks from an electrical machine. From one to twenty sparks were included in each negative, and their form was so precisely similar to those of lightning flashes that there could be no question that lightning pictures were what they claimed to be.

Mr. Walmsley showed one of Horsman's Eclipse outfits, which were sold for two dollars, including all apparatus and chemicals necessary to produce photographs. He also showed some blue prints made upon postal cards which were prepared and sold ready sensitised for the purpose.

Correspondence.

Correspondents should never write on both sides of the paper.

CAREY LEA.

To the Editors.

GENTLEMEN,—The concluding sentence of your short article headed *Photochloride of Silver* must, I think, be heartily echoed by the older readers of THE BRITISH JOURNAL OF PHOTOGRAPHY. It was with mixed feelings of delight and regret that I this morning saw your announcement of Mr. Lea's valued communication in the current issue of the JOURNAL—delight, that its pages are again enriched with an intensely interesting record of his able investigations; regret, that ill-health has been the cause of his long silence.

Can I not venture to say that Mr. Lea may count upon the hearty sympathy and sincere good wishes of many like myself, who, though they know him not personally, remember his past service to our art-science? for he is one of that honourable company of original investigators which has a direct claim upon our gratitude and esteem.

That it may please God to quite restore Mr. Lea's health and strength and give to him "length of days" for further usefulness, is the sincere prayer of—Yours, &c.,

W. HANSON.

71, Great George-street, Leeds, May 27, 1887.

STEREOSCOPIC PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—As the above specially interesting branch of photography seems to be again "creeping to the front," I wish to call attention to a fact I do not recollect having seen stated, namely, that a distinctly stereoscopic effect can be obtained from two prints from the same negative. Properly mounted for the purpose, the result, while of course not equal to that obtained by prints from the two negatives, is a decided improvement on the single print.—I am, yours, &c.,

JOSEPH H. WOODWORTH.

Sydney Lodge, 89, Booterstown-avenue, Dublin, May 30, 1887.

[If properly mounted, a stereoscopic effect will be obtained as between the mount and the picture, but not as regards the relation of one part of the picture to another. But we have in our possession more than one "stereoscopic" picture bearing the name of a maker of repute in another part of the world, which are unmistakably produced from only a single negative; but there being no well marked object in the immediate foreground to serve as a foil to the distance, the trick is rarely discovered.—Eds.]

UNRELIABLE MEASURES.

To the Editors.

GENTLEMEN,—Allow me to point out a source of error, and sometimes complete failure, which is not generally suspected. Some weeks ago I broke the foot off my last sixty-minim measure, used for measuring concentrated solutions for developing, and at once bought another supply. Since the new measure came into use my negatives have been poor and thin, and have taken longer to develop. Of course I did as we are all inclined to do, attributed the fault to the only source of all our failures—the plate maker, but a few days ago something prompted me to compare the old graduated measure with the new, with astonishing results. I found that sixty minims, according to the new measure, only filled up to

forty-five in the old one; I had, therefore, been using my developer nearly one-third weaker than usual.

Both sizes of measures were bought from the same firm, who ought to have tested these frauds, and have saved themselves from supplying photographers with pitfalls which even experienced operators would scarcely suspect. If we cannot trust our weights and measures where are we? No wonder that different experimenters get different results from the same formula if they are liable to this enormous variation in their measures. And one cannot help suspecting that the same principle may run through everything, and that we cannot hope to even get two supplies of the same article alike.

With this I send one of the measures that you may test it with a correct one, if there is such a thing.—I am, yours, &c., H. P. R.

[On testing the measure sent by our esteemed correspondent, we find, on testing it by one of our own, that it is inaccurate to the extent of nearly twenty-five per cent. This is truly reprehensible.—Eds.]

PATENTED INVENTIONS.—A DETECTIVE CAMERA.

To the EDITORS.

GENTLEMEN,—By parcels post I send you the remains of a detective camera, the back of which seems to be identical in principle with that described in your last issue as patented by Mr. A. S. Newman. Like it, my back is a box with a spring at the back forcing the plate forward to the front, and provided with a cover with two slits, through one of which the plate when exposed is forced up into a light-tight bag, whence it is passed down through the second by the hand outside the bag to take its place at the back of the box behind the other plates. The plates were contained in carriers of ferrotype plate. The only difference even of detail seems to be that while Mr. Newman provides a special mechanism to raise the plates on withdrawing the sliding shutter, in my camera an unexposed plate is pushed by the spring into its place, and on closing the slide after exposure is forced by it up into the bag.

This camera was made in the spring of 1885, and was first used out of doors on the Whit Monday of that year, and of course was shown to many of my friends. That it was quite a practical success you will see by prints I enclose from negatives, one of which was taken on the Whit Monday in question and the other a few days after, and I have always intended to reconstruct it in a more workmanlike manner. Perhaps you will kindly verify this description and return the camera, to defray the postage of which stamps are enclosed.—I am, yours, &c.,

Hotspur-street, Tyne-mouth.

HENRY R. PROCTER.

[All quite right as per above description; but the making and using of the instrument, and even the showing of it to friends, may possibly not be considered publication in the sense of overturning a patent. Why, when an invention is made, cannot ingenious photographers send an account of their inventions to the journals, for such publication as will be recognised in a court of law?—Eds.]

MR. NELSON'S PHOTO-MICROGRAPHIC APPARATUS.

To the EDITORS.

GENTLEMEN,—Perhaps you will allow me, as one who has had some experience in photo-micrography, to make one or two remarks as to this matter.

In the first place, it may be taken for granted, I think, that the chief thing to aim at is to get a correct and perfect adjustment of the image on the camera screen. Many devices have been adopted for this purpose, but they chiefly resolve themselves into that of rotating the fine adjustment button by means of a long rod, to which the button is connected by a cord, or thread; Dr. Maddox waxes the thread—a very good plan, which gives it grip. When using high-power lenses from $\frac{1}{2}$ inch upwards a variation in the adjustment of the $\frac{1}{1000}$ of an inch, and even much less, is distinctly perceptible to the eye. Granting that the lens used is a good one, giving a sharp and finely defined image, and that the illumination is everything that could be wished, and the arrangements perfect, I would ask, What is it all worth if the whole are put wrong by the use of a slide incapable of working to register? I have seen several of the new metal slides, in fact I have three of them before me while I write, and there are none of them I should ever think of using, or dare to use, in a photo-micrographic camera. They may do well enough for a landscape where the lens has a considerable depth of focus, but in a photo-micrographic camera where there is none, it simply destroys and puts to naught the whole of the previous delicate arrangements. They are not flat in the slides, and I doubt much if they can be made so; and yet Mr. Nelson used slides of this sort. It cannot be too strongly insisted on that there must be the most perfect register between the image on the screen and the exposed face of the slide. If it were possible to remove the screen from the frame and substitute the sensitive plate for it, photo-micrography would be made a much simpler affair than it now is.

There is another point which requires the most careful attention,

namely, the utmost possible rigidity of that portion of the camera into which the dark slide goes. One maker of repute constructs a very nice apparatus for photo-micrography, but the whole thing, although well and firmly constructed otherwise, is spoiled by the use of a camera which racks out behind, and that portion has no support on the baseboard of the apparatus. Delicate focussing arrangements are of no avail unless the back portion of the camera is perfectly rigid.

I have been tempted to make these remarks by a notice of Mr. Nelson's arrangements in yours of May 13, which I have just seen, in which it is stated that the "advantage of using an eye-piece is undoubted in the direction of convenience." And so it is. The camera is shorter, the whole apparatus is more compact, and much more under control in the manipulation, and the field of view given by the object glass is flatter. But there are disadvantages which more than counter-balance these. One is the diminished light, rendering very much longer exposures necessary; another, and the chief of all, is that so clearly pointed out by Professor Abbe in his paper in the February number of the *Royal Microscopical Society's Journal*, namely, the use of an eye-piece has the effect of separating more widely the chemical and visual foci of the objective. It is so difficult to get a good micrographic objective in which these are combined, or nearly so, that no one ought to do anything to still further widen the breach. I have never used an eye-piece for photo-micrography. I felt that the eye-piece did harm, why I did not know. Now we know, and know that we should eschew eye-pieces.

Photo-micrography is now coming rapidly to the front, both for the purpose of book illustration and in the examination of diseased specimens of pathological tissues, and anything which tends in the least degree to render the apparatus more convenient in the use cannot but be of value, and cannot be made too widely known. Even your own valued contributor, Mr. Pringle, has been bitten, and is, I hear, pursuing the subject.

I do not make the above remarks in any captious, fault-finding spirit. I only want to add my mite to help on the good work to which so many able men are devoting time and energy, without, in some cases, knowing the why and wherefore of certain things about the art.—I am, yours, &c., PROCELLA.

STORING NEGATIVES.

To the EDITORS.

GENTLEMEN,—On reading an article in the *JOURNAL* of a week back on the subject of storing negatives, I thought a method I have employed for mine, and which I find very successful, might perhaps be of use to some of your readers, especially the amateurs.

I made a plain wooden box, twenty-seven inches long, nine inches high, by seven inches wide, of which the inside measurement is $8 \times 6 \times 26$. Then, by placing each negative in a separate envelope, the box will hold comfortably 200 half-plate negatives placed in on end. The lid of the box should be about two inches deep inside, so that when the box is open the negatives stand above the level of the box, as this greatly facilitates taking them out. A further convenience is to divide the box into ten compartments, by means of thin pieces of wood, which prevents too many negatives from leaning against each other. All my envelopes are numbered, and as each compartment holds just twenty any one number can be selected without disturbing a single other negative. When the box is full it can easily be stacked away, as it takes up very little room, and can be shifted from place to place with ease.

Any amateur can make his own box, or can have it made for a small sum. Of course, it must be fairly strong, owing to the weight of the glass; half-inch deal will, however, be found quite strong enough.

The dimensions I have given you are so arranged as to leave a decent margin, as it is easier to move the negatives if they are not packed tightly. It may be that this idea has been suggested before, but if not, and you think it might be of service to some of your readers, kindly insert it in your pages. I should be very glad to give you any further information on the subject, if necessary. Should you decide to insert this, do not hesitate to condense it, if you think you can simplify it, as I have no doubt the space in your *JOURNAL* is fully occupied.—I am, yours, &c., JOHN GLADSTONE.

Kelton, Edgbaston, Birmingham, May 29, 1887.

THE RIGHT TO THE NEGATIVE.

To the EDITORS.

GENTLEMEN,—Once more, and only once, I ask your kindly indulgence. Successful extortion cannot be eminently satisfactory to any honourable profession. To say it is so would be a slander, against which I, for one, would strongly protest.

One thing to be learned from the letters on this subject which have appeared in your *JOURNAL* is, that minds thoroughly warped with the interests of self to the exclusion of the claims of others are incapable of judging what is morally right and what is morally wrong.

The healthy and honest utterances of Mr. Dutton, of Bath, in your last issue, I take, from experience among them, as the representative utterance of the great body of photographers.

Mr. Dutton's letter, and the letter which follows, may some day prove to contain the data from which the question at issue will be finally settled.—I am, yours, &c.,
J. F.
Newcastle-upon-Tyne, May 28, 1887.

To the Editors.

GENTLEMEN,—We are now getting on with Sitter versus Negative. Mr. Dutton considers throughout this trial "all your correspondents appear to have missed the point." It's now thought the greedy photographer, having purchased his plates, may be fully entitled to own the glass, gelatine, and silver contained thereon. But "the point" stops at the "impression," and this is the private and absolute property of the sitter. Good. Supposing he or she desires to exercise the right to take away the said "impression," will Mr. J. Dutton say how it's to be done, keeping in mind the film and glass belong to the photographer?—I am, yours, &c.,
T. COAN.

Exchange Column.

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

- Ross' 12x10 single view lens in exchange for an Optimus or other rapid rectilinear quarter-plate.—Address, DIXON, Photographer, Coine.
- Will exchange photographer's cart for half-plate portrait lens or photographic sundries.—Address, A. TAYLOR, Photographer, 77, Fore-street, Ipswich.
- Wanted, camera and lens, printing frames, and posing chair. Will give good exchange in backgrounds.—Address, J. DEAN, Brook House, Clough, Golcar, Huddersfield.
- Wanted, a good enlarging lantern or night-light in exchange for photographic dark carriage in splendid condition. Photograph sent.—Address, J. WALKER, 48, Wellington-street, Woolwich.
- I will exchange 10x8 studio camera, having swing back with three motions, equal to now, and Voigtlander's No. 7 portrait lens, for a 3B Dallmeyer's or Ross' lens, or 15x12 outdoor camera and lens by any good maker.—Address, MELVILLE, 105A, Market-street, Manchester.
- Wanted, 12x10 very light camera, twenty-six inches extension, rising front, swing back; also twenty-four-inch $\frac{1}{8}$ or $\frac{1}{10}$ single landscape lens, and ten-inch wide-angle symmetrical. Exchange for quarter-plate camera, six slides, leather case, Scepticon lantern, three-and-a-half-inch condensers and lens, 12x10 glass bath and chonite dipper, nineteen-inch porcelain print washer, 12x10 new strong tripod, and Cadott's two-guinea shutter, working inside camera.—Address, PACO, 10, Cambridge-gardens, Richmond, Surrey.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED :—
John Stuart, 120, Buchanan-street, Glasgow.—Two photographs of Rev. J. McGregor.

- D. D.—We shall make inquiry and let you know (if possible) next week.
- T. A.—Negatives that have been intensified after fixing should not again be treated with the fixing bath.
- G. F.—First ascertain the focus of the lens, then determine the relations existing between the aperture in the stop and the focus; lastly, square these relations and compare with each other.
- W. L. (Bridgwater).—We doubt not that the article advertised quite bears out what you say, but we like to see and test such things before admitting any certificate as to their merits. You labour also under the disadvantage of withholding your name.
- J. HUMPHREY writes: "Having a permit from the Board of Works to photograph in Royal parks and gardens, can you kindly inform me if this permit includes Kew Gardens, Richmond, Greenwich, Busby, Windsor, and other parks outside the metropolitan area?"—Our correspondent will only be allowed to photograph in the places specified on the permit.

QUERY writes: "In purchasing a first-class photographic business, on what principle should the valuation of the good-will be made, and what is the usual method of estimating the value of the negatives? If you could answer above in your JOURNAL I should be obliged."—We are unable to answer this query properly, and shall feel obliged if any readers conversant with the transfer of businesses will give the information.

LEX.—No description of roll holders other than in our publication of specifications of Patents has appeared in the JOURNAL.

GEORGIUS "would be glad of an answer to the following queries: He intends sensitising his own paper. He will sensitise perhaps once a-month. Will the bath keep uninjured if not used? He will place it in the sunlight to purify it. Does this exhaust the silver?"—In reply: The silver solution will keep quite good for an unlimited period. The only matter that is thrown down by sunlight is an organic compound that it is desirous to get rid of. A tablespoonful of kaolin kept in the solution will answer better.

INQUIRER writes: "I. Can you tell me if crayons suitable for doing back-grounds, as recommended by you a short time back, can be bought? If so, where? If not, do you know any one who would undertake to make them?—2. Can you recommend any particular detective camera up to half plate?"—In reply: 1. The crayons cannot be bought, but colours suitable for making them can be obtained from any oilman. This, mixed with a little water and dextrine, and moulded into shape and afterwards dried, is all that is requisite.—2. From what we hear, it is likely that quite a number of detective cameras will be in the market very soon.

E. B. sends queries as follows: "1. If a person is limited to one pair of stereoscopic lenses, what would be the most useful length of focus for them?—2. If the lenses are placed opposite the centre of each half of an 8x5 plate, can they be used in that position for an ordinary stereoscopic plate, that is, 6 1/2 x 3 1/2?—3. Is the single combination of a rapid symmetrical lens as efficient for landscape work as a single landscape lens of the same focal length?"—We reply: 1. About five or six inches.—2. Yes, certainly. See our articles on this subject in the ALMANAC.—3. A portion of a compound of the rapid type makes an admirable single landscape lens, but it is necessary that such an adaptation be made as to have the stop placed at a somewhat greater distance from the lens than when it is employed as an elementary part of a compound objective.

EDINA writes: "I have had great bother with my silver baths, new as well as old, for the last month, with a white-like scum or fog which when rubbed with finger or piece of cotton wool rubs up white. The baths work one or two plates at intervals all right, but then go wrong again. I have tried all usual remedies without success. I may also mention that dark room forms camera; have also had samples of silver from more than one firm. Do you think fumes of gas and other chemicals affect plates when in holder exposing? I may also mention I use same collodion and developers as I have used for years. If you can assist me out of my difficulty and favour with an answer in your next issue you will greatly oblige."—If our correspondent is quite certain that the fogging does not arise from light, then must the cause be organic matter in the silver bath. Add a few drops of a weak solution of bicarbonate of soda—enough to render the bath slightly milky, expose in the sun for several hours, acidulate with nitric acid, filter, and employ a collodion that is of a sherry colour, and the fogging will be a thing of the past; but no gaseous fumes must be allowed to have access to the plates while being exposed. A few drops of tincture of iodine added to the collodion will frequently ensure cleanness of the image.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—On Saturday, June 4, there will be an excursion to Loughton. The train leaves Liverpool-street (Great Eastern Railway) at thirty-five minutes past two p.m.

HOW IT IS IN PARIS.—The following is an extract from a note received from Mr. Prithoe, of Bristol:—"I have just returned from Paris, and write to thank you for so kindly sending me an introduction to Professor Stebbing. My friend Mr. G. Seamell accompanied me over, and I lost no time in sending your note to Mr. Stebbing, who wrote me making an appointment, and I spent a most pleasant and profitable day in his company. He took us to see several first-rate studios—the most interesting being M. Nadar's, who received us with a hearty welcome and showed us around his fine establishment. Amongst other things he showed us some good work on Eastman stripping films—some he had just taken of the fire at the Opéra Comique. The weather was most unfavourable for outdoor work, but what we saw was very good under the circumstances. M. Nadar told us he never got any failures with the stripping process, and seemed to be greatly pleased with it. His reception room is a most elaborate place, and his sitters are conducted to his studio on top of the house by means of a lift. I noticed several good features at this place which I shall endeavour to benefit by. Mr. Stebbing could not have been more attentive and kind to an old friend than he was to us, and I shall always remember our pleasant day together. I was very sorry to see his nice little plate factory in ruins, and although fully insured he has a troublesome lawsuit pending with the insurance company, which I wish him well out of."

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1414. Vol. XXXIV.—JUNE 10, 1887.

THE LATEST THING IN PHOTOGRAPHY IN "NATURAL COLOURS."

THE old adage says that "It never rains but it pours." Scarcely has the Mayall process of (alleged) photography in natural colours had time to cool down by the discovery that it is *not* a process of photographing in "natural colours," than, as we hinted last week, another Richmond enters the field, this time the Cellierier Syndicate, Limited.

Although the title this Syndicate adopted at first—"Photography in Natural Colours"—was misleading, and therefore reprehensible, yet when we pointed out to them the real meaning of the phrase as long understood by scientific photographers, they at once disavowed any intention of desiring that the public should be deceived by any misleading term, and have lost no time in amending their title to the more accurate one of *Photographs in Colours*, to which no objection arises.

Responding to an invitation to see specimens of the Cellierier-Parkes process and to witness the method of producing them, we called at their gallery in Pall Mall, where we saw several examples of the work, but did not witness the operation of producing them, for which purpose we were told we should have to visit their works in Sidcup, Kent, where the pictures are made. The appearance of these prints is in some cases rather pretty, bearing a resemblance to good work executed by the time-honoured and times-without-number-patented crysolium process. One of the specimens having been dissected revealed the fact that it consisted merely of a transparency on glass, having a white paper backing, upon which had been painted washes of water colours which, when the transparency was superimposed, showed through and thus imparted apparent colour to the picture, the drawing, lights, and shadows of which were obtained in the course of ordinary photography. How, on the strength of such a process, the "invention" has been acquired, as we are told, by a party of influential British capitalists—the Cellierier Syndicate, Limited—we are unable to say, but it speaks well for the organising ability of some one.

We were, some months ago, shown a prospectus, when the shares were being issued, in which it was stated as an inducement for intending applicants that a large amount by way of returns would ensue from the royalties or licences paid by professional photographers all throughout the country, who, to save themselves from the successful competition of others, would be compelled to become licensees of the company; and our friends naturally will look to us for information as to how or to what extent they will incur danger to themselves by

either colouring a transparency from behind or backing a plain transparency with paper having on it washes of colour.

The first (or among the first) to apply a coloured paper backing to gelatine transparencies, which in those days were made by the Woodbury process, was R. H. Ashton, who, in March, 1866—now over twenty-one years ago—obtained a patent for an invention entitled "Improvements in pictures obtained upon paper, glass, porcelain, or other surfaces with transparent or semi-transparent materials." In this the backing paper was printed upon in flat tints by chromo-lithography, or "by any other known process." We feel rather an interest in the Ashton process, because we have still in our possession specimens of his backing papers (which he called chromotypes), and also because such chromotypes have, as we think, a not unimportant bearing upon the invention patented by M. Cellierier. Anyway, those of our readers—and they are not few—who have entered the field of photography within the last two decades will be glad to know what was done in this direction anterior to their time.

The Ashton process, the originator of which was in business alliance at the time with the late Walter B. Woodbury, consisted in backing a transparency with white paper, on which was depicted either by hand or (for large quantities of prints) by chromo-lithography, such a backing in colours as served to show behind the transparent photograph, and thus impart apparent colour to it. Much of Ashton's specification is devoted to the most convenient methods of obtaining correct registration when superimposing the print upon the chromotypic backing, but this is of no consequence for us just at present. What we are seeking to show is that the principle of backing transparencies with paper washed with colours had been long ago recognised. To establish this more clearly, we make a quotation from the specification: "I have above particularly alluded to obtaining prints on paper; when they are to be on glass, porcelain, or other hard substance, angle pieces may be adopted; the position of these angle pieces are transferred to the surface which effects the colour printing," &c. Again, "The two printings may be combined by transferring a print obtained in gelatine to the chromotype, in order to effect which the following method may be adopted." Here follow details. "After which the paper may be stripped, leaving the gelatine print superimposed on the chromotype." If the gelatine print be on glass, the registration is adjusted to the chromotype by hand. "I have hitherto supposed that the coloured picture" (the backing) "is produced by printing; but the same effect may be produced by filling in the required tints by hand, and

this method would of course be adopted when a few copies only were required."

Now it appears to us that the Ashton invention, of which we have here given only an outline, presents features of marked similarity to the new Cellier process. Be this as it may, our readers will, from the foregoing, judge to what extent they may go without infringing any patent, the one in question having lapsed many years ago.

Towards the end of the same year, 1866, the papers literally gushed over an alleged new process of photography in colours which was going to revolutionise the art. This is the way in which it was heralded by one of our daily papers:—"The honour of producing on paper the exact colouring which the human form throws on the camera has been reserved for M. Chambay, whose process I have carefully investigated, and am able to declare that he succeeds in producing a portrait which gives all the exquisitely varied tints of flesh, together with a transparency in the shades never before attained. This is a great chemical triumph." But it was quickly revealed that this revolutionary process, this "chemical triumph" consisted in superimposing a very transparent coloured picture over an opaque one more strongly tinted with brilliant colours. And after an inspection of some of the Chambay pictures we wrote at the time that the colours were not obtained, as alleged, by chemical means but were put on by the brush, and we added that the processes for producing such effects had, on several occasions, been published in the JOURNAL. And this was in December, 1866.

We have no desire to say anything here concerning the Cellier patent, or its validity, as we shall take an early opportunity of reprinting it in its entirety; but so far as we were permitted to see the result of the process (and we speak only of what we saw) their invention appears to have been in a large measure forestalled by those to whom we have referred, not to speak of the system so successfully adopted by the late Oliver Saroni in connection with his large portrait transparencies, which were backed with papers containing hatchings executed by lithography and also by tinted sheets.

EXPOSURE.

WHAT may be considered a correctly timed negative? This is a question impossible to answer, inasmuch as there is no real standard for comparison, and even if there were a great diversity of opinion would still exist amongst different operators. Supposing a batch of negatives of average quality were submitted to half a dozen photographers, various opinions would be expressed as to which out of the number had received the most correct exposure. If this diversity of opinion exists with reference to negatives when they are finished, what must be said with regard to the exposure in the first instance?

Every experienced photographer knows quite well there is such a latitude allowable that it is possible to produce fairly good, if not indeed very good, negatives when there has been a great departure from what may be termed the normal exposure, supposing such a thing to exist. This, as every one knows, is accomplished simply by modifying the development. This brings us to the point for present consideration. Given two photographers working on the same subject, with the same plates, and under precisely identical conditions, it will often happen that the one will habitually give a much longer exposure than the other, and yet each will obtain in the end equally

good negatives. This is owing to the development being conducted by the two men under different conditions—the normal developer employed by A. being in fact what B. would consider only suitable for what he would term under exposed plates, while that used by B. is just such as A. would think fit only for what he would designate over exposed ones. In a word, B. would look upon A.'s negative as being under exposed and forced in the development, while, on the contrary, A. would consider B.'s over exposed and restrained in the development. But, as we have said before, both operators may obtain, to all intents and purposes, equally as good printing negatives.

This diversity of opinion as regards the proper exposure has not arisen entirely since the introduction of dry plates, as it existed, though, perhaps, to a minor extent, in the days of wet collodion. It then often occurred that what one artist would consider a correctly timed negative another would pronounce over, or perhaps under, exposed. Some operators, as a rule, gave a much longer exposure than others and considered it absolutely necessary for the best results. With the maximum of exposure the details of the picture quickly appeared when the iron developer was applied. The plate was then intensified with pyro and silver to the requisite density. When, on the contrary, the minimum of exposure was given, the iron solution was more relied upon to bring out the image, with the result that it came out more slowly, and by the time the negative was fully developed little, if any, after intensification was necessary.

Here, again, equally as good printing negatives, apparently, were secured under, in some cases, widely different standards of exposure. The two classes of negatives obtained under these conditions we have heard familiarly described as "light negatives" and "chemical negatives," according as the power of the light of the developer—if we might use the term—had preponderated.

Now, however much opinions may differ amongst experienced artists as to the theoretically correct exposure, there is no question whatever that a very large proportion of amateurs' negatives are decidedly much under timed and more or less forced in the development. Of course we are not alluding to the work of the well skilled amongst amateurs, but more particularly to those of somewhat limited experience.

Generally, when looking through a collection of prints from amateurs' negatives, one can scarcely fail to be impressed with the general lack of detail in the deepest shadows, these being too frequently represented as little better than black masses. Particularly is this the case with foliage. In most cases an examination of the negatives will show that the detail may be all there, but of a very feeble character. Consequently, by the time the lights are printed through, the shadows have become completely buried and lost. The real test of the quality of a negative, it should be borne in mind, is not what can be actually seen on looking through it, but what it will yield when printed from.

It was one of the maxims in the collodion process, "Expose for the shadows and leave the lights to take care of themselves." This maxim should also be applied to dry plates. If it were, it would be found that many amateurs' negatives should have had twice, and, in some instances, as much as three times the exposure they received. Had this been the case, the shadows would have been full of detail, and the whole picture harmonious instead of being heavy and patchy. Knowing full well this general tendency towards under exposure with amateurs, we introduce the subject once more in

order that they may steer clear of the reproach which applies to so many of their productions. The novice ought to bear in mind that a good negative should possess no clear glass whatever, save in the *extreme* points of the deepest shadows, and even these may often be slightly veiled with advantage.

A FEW years back, when more interest was bestowed on the electric light in its commercial aspects than is being done at present, the late Sir William Siemens, at the conclusion of a course of lectures at the Society of Arts on the dynamo, its construction and capabilities, in proposing a vote of thanks to the lecturer remarked somewhat to the following effect:—He wished the public would attend such lectures as those just delivered, and learn something about the subject dealt with, instead of rushing off to the Stock Exchange with their money. This was sound and genuine advice, and applies equally as well to other speculations as to those on electric lighting.

WE learn of a very singular paper having been read at a recent meeting of the Canadian Institute by Dr. Rosebrugh on *Photography of the Interior of the Living Eye*. The feat was performed as follows:—A glass transparency was illuminated by the sun, and reflected into the eye by a piece of plate glass placed at an angle of forty-five degrees to the rays passing through the transparency. The image thrown on the retina was viewed through this glass from a point situated in the axis of the eye, and a small camera and lens there placed, which gave an image of the picture on the retina, and it is stated that photographs taken with about five seconds exposure by this means were exhibited at the meeting. Of course the pupil of the eye had first to be dilated by artificial means before making this very remarkable experiment, and it is obvious that, even with a five seconds' exposure only, the submitting of the eye to the strong illumination described, and the keeping it motionless for the time required, must have necessitated a considerable amount of painful endurance and steadiness of nerve.

OUR contemporary, the *English Mechanic*, recently printed a letter from a correspondent asking the meaning of the expression, "a ten per cent. solution," a form of words whose liability to misunderstanding we have before alluded to in these pages. It is, however, quite evident that, whatever practical skill and theoretical knowledge many amateurs and others are possessed of, the knowledge of the application of elementary science to tables of weights and measures is by no means general; for on reading the replies to this particular query we note that, though six correspondents have rushed to the rescue, one only—and he dismisses the subject in a few lines—has managed to escape blunders of a most egregious description. The subject is by no means an unimportant one, and we will, therefore, make a few practical observations upon it very shortly.

WE have on former occasions referred to the manufacture of sundry articles useful to photographers from paper, and we now learn that the production of paper bottles is become an important industry in Chicago. For photographers who are travelling about, such vessels would be of the greatest use, and we should imagine that they will ere long become part of the usual stock of the dealers. These bottles are coated internally with a protective varnish, which is stated to be capable of resisting both acids and spirits. The bottles are constructed by first making a tube by rolling upon a mandrel sheets of paper cemented upon one side, which tube is then cut into suitable lengths, and fitted with wooden or paper bottoms cemented in their place, and also, when required, with the paper necks, which likewise are cemented to the tube. All that is then necessary is to varnish the interior with a suitable material, which protects it in the efficient manner described.

WE have on a previous occasion referred to the photographing of a bullet during flight, a feat whose counterpart was performed a quarter of a century ago by Mr. Skaife, who, as some of our readers may remember, took a negative of a shell after leaving the cannon's mouth.

This later feat, however, possesses points of special interest. It does not need explaining that the rapidity of the flight of a projectile is nowadays far beyond that obtained at the period we speak of, though, again, this difference is more than discounted by the sensitiveness of dry plates as against wet collodion. The projectile in the present case was fired from a Werendler gun, its velocity being thirteen hundred feet per second. The negative gives an image not only of the projectile itself, but also of the layer of air enveloping it, which is seen to be of a hyperbolic form.

THE marvels of modern photographic representations are by no means exhausted by the above recorded examples. Mr. Baker, the architect of that wonderful piece of engineering skill now so near completion—the Firth of Forth Bridge, gave a most interesting account of the work and its progress in a lecture delivered at the Royal Institution last month. During the course of his lecture he stated that photographs had been taken of the interiors of the huge caissons, which, diving-bell wise, were used to work from at the bottom of the water. These caissons were entered through an air-lock, and the pressure of air was often as high as thirty-five pounds to the inch. The photographs, however, were defective from a singular cause: every one who has experimented with an air-pump has noticed the haze produced when the pressure of air is first reduced, and a similar effect was produced in these caissons. Every now and then the compressed air would find its way out of the huge chamber, at the edge, and then a haze was formed resembling the air-pump mist, which naturally affected the integrity of the shadows of the photograph. This it would be the more likely to do, seeing that the glare from lamps of an aggregate power of six thousand-candles would heighten the effect. Mr. Baker says exposures of fifteen minutes were sometimes given, but "the results were not so good as could be wished, the eyes especially coming out in a glaring, spectral fashion." With exposures of a quarter of an hour, and the barometer standing at about seventy inches, it could scarcely be expected that niceties of expression could be secured.

It is little probable that light modification for dark room purposes will ever be brought about by other means than the familiar one of filtration by means of coloured screens of translucent material—glass, paper, or woven fabric. It is, however, when delicate experiments are in question, well to remember that no one screen used is absolute in its light separating power, as some of the more refrangible rays will pass through almost every substance in popular use for the purpose. It is useful, therefore, to have in our power still other means for producing monochromatic light, and these would seem to be available in a method recently described in a foreign journal. The expedient is simple. A salt which is known to impart a certain desired colour to flame is put into a hydrogen generating apparatus at the same time as the zinc, and the gas required to feed the flame is then passed through this flask on its way to the burner. It must be said of this method that gas so passed should be hydrogen, for if ordinary coal gas were used we should anticipate the actinic rays usually given out from its flame to be simply masked and not intercepted or destroyed.

HARDWICH ON THE OPTICAL LANTERN.

I THANK you for the bundle of JOURNALS you sent me containing articles on lantern matters. I have read them with much pleasure, and with your permission should like to make a few remarks.

First, as regards Mr. Brooks's paper on the oxyether or "ethoxo" light. I am one of those who think that Mr. W. Broughton, of Manchester, has been badly treated. He gave us a simple and reliable process, and has received but a scant measure of praise. They say that the oxyether is not safe in the hands of inexperienced persons who decline to follow instructions; but may not the same be said of the oxyhydrogen? and yet this process is much used.

Mr. Brooks speaks of the ether throwing down a white deposit on standing. This, I think, must be due to the materials used in soldering the tank, as I have never observed anything of the kind in my own experience. The methylated ether I employ is supplied to me as a favour by Messrs. Mawson & Swan, of Newcastle-on-Tyne, and is, I

fancy, the same they use for their collodion. It is so light that a 1000 grain s.g. bottle of it weighs not more than 710 grains at 60° Fahr., and I use it over and over again by filling up to the original bulk with fresh ether. It would be no advantage to use cheap and inferior ether of '750 or more, as greater attention would have to be given to the taps, from the constantly decreasing volatility of the fluid.

During the past season I have used the oxyether limelight almost exclusively, with the modified form of tank and safety jet described in your JOURNAL about a year since. No difficulties of any kind have occurred, with the exception of an occasional hissing or roaring noise when the bag is heavily weighted.

Any one who has not heard this unpleasant noise may produce it, at will, in the following way. Begin by selecting a nipple which experience has proved to work silently at high pressure, and remove lime dust or any other kind of roughness by polishing the interior of the bore with a needle of a suitable size, scratched transversely by rotating it on emery powder between the finger and thumb, as advised by Mr. Lewis Wright. Then get all into working order, and whilst the flame is playing quietly against the face of the lime, with the two gases in the right proportions, *pinch* the shut piece of rubber tubing which conveys the oxygen from the tank to the jet until the channel is almost obliterated; the flame will rise to a great height in the lantern, but there will be no noise. Now release the oxygen tube and pinch the ether vapour tube in the same way; the flame will then become small and blue, and there will be a loud roaring or hissing, which can be heard at the further end of the lecture room. Even when you remove your finger and both gases are flowing again in the correct proportions, the roaring will continue, but if you lift the lime cylinder off the pin and take it quite away it will cease. Evidently, therefore, the lime has something to do with the hissing, and so has an *excess of oxygen* in the flame. High pressure must also be taken into account, and this is the reason why the roaring often happens at the beginning of the lecture, because the sides of the bag are then tight, and every pound of additional weight tells. Also because the air has not been entirely expelled from the tubes, for I find that oxygen contaminated with atmospheric air is more noisy than pure oxygen.

To prevent the hissing, load the bag at first with not more than two half-hundredweights, and if it is a large bag, eight feet or more, put on another fifty-six pounds at the end of twenty minutes or half an hour, always taking care to see that the edges of the flame are red from excess of ether. If the noise should begin in spite of this precaution, turn off the O tap until it ceases, and then gradually turn it on again to the right point. When the bag is half empty, we may put on a fourth fifty-six pounds; but I find no advantage myself from doing so, provided the granule chamber be kept in working order by an occasional pricking out of the wire gauze with a needle and filling up with fresh pumice.

No "snaps" or "passing back" must be permitted, or the wire gauze will soon be choked up, and heavier weight be required on the bag. Extinguish the flame at the end of the lecture by turning off the H tap slowly and allowing the O to blow it out. In the case of dissolving lanterns keep the bye-pass rather high, and if snapping still occurs file the H groove in the plug of the dissolver a *little* longer and deeper than the O groove.

I have now said enough on the precautions to be taken for securing a noiseless flame; only one more needs to be mentioned. Notice the distance of the lime cylinder from the jet, as the hissing is worse when it is too near. Supposing the nozzle to be bent at an angle of 45°, a quarter of an inch will be a suitable distance, measured in the direction of the flame. But as the limes I use are all exactly of one size, I find it answers very well to measure *half an inch* from the orifice of the jet straight across to the lime pin, and the flame will then be exactly a quarter inch long before it strikes the cylinder. You may see when it is right by the appearance of the lime itself after use; it should be worn away into a shallow cavity of an oval shape, and if it is drilled with a number of circular holes side by side the cylinder was too near.

Mr. Brooks is quite right in saying that the two short lengths of rubber tubing which connect the tank with the jet should not be allowed to get out of condition. This, in fact, is the principal element

of danger in the process, and I once heard of a case of that kind which nearly led to a disaster. A bottle of compressed gas was turned on rather suddenly, when the rubber ripped up from end to end, and a flame shot out a yard long. Even supposing the tube to stand, it might easily be forced off from its connection with the jet, and a stream of ether, more or less explosive from admixture with oxygen in uncertain quantity, be lighted from the nearest flame. I am glad to be assured by Mr. Baker that with the "automatic gas regulator" nothing of this kind could happen; but I think it would be an improvement if Mr. R. Beard, the inventor of the valve, could make it equivalent to *six inches* of water pressure, when desired, instead of twelve inches. Meantime, we must secure ourselves by tying the rubber carefully to the jet, and choosing a strong kind, in which the diameter of the two sides together is as great as that of the bore (half inch tubing, with sides of one eighth inch thick and a quarter inch bore).

Zirconia Light.—This paper, by Mr. Lewis Wright, interested me extremely, and strengthened the conviction I had previously formed that the brightness of the limelight disc on the screen depends on the *area* of ignition as well as on the intensity. It seems that Zirconia is not a good conductor, and that the incandescence does not spread. I have noticed in the limes of different makers that some give a larger area of ignition than others, and more light; also a difference in the colour of the illuminated disc, which is *yellowish* with one lime cylinder and pure white with another. The oxyether flame is larger than that of oxyhydrogen, and hence, although its heating power is less, the ultimate result, as regards brightness of disc, is nearly the same. We can see at once by looking at the lime cylinder that a much larger surface is incandescent when ether is used in place of coal gas.

The above remarks do not apply to the limelight used with the microscope. The radiant ought, I presume, in that case to approach more nearly to a point.

Dissolving View Apparatus.—I can never regret having purchased a binial lantern, because I have learnt much by it that I could not have known in any other way. Nevertheless, I find that, as years go on, I use it less frequently than I once did. My people seem abundantly satisfied with a single lantern, provided it is a good one, and the lecturer, when left without an assistant, has less upon his mind. I agree with Mr. A. W. Scott that the pictures are not intended to supersede the lecture, but to illustrate it, and therefore the less of reading from a book, and the more of a simple and natural talking to the audience in your own words, the better.

A friend came to me not long since prepared to spend sixty pounds upon a triple lantern, but I advised him not to do so at that time. It would, I thought, be better for him to perfect himself in the first instance with a single lantern, and then to consider what should be his next step. It often happens with these double and triple lanterns that the condensers are not exactly of the same size, nor the grooves in the slide carriers of equal depth. Hence an amount of adjusting and centering is required most puzzling to a beginner. The management of the limelight is also more difficult than in the case of a single lantern.

Manufacture of Oxygen.—A student fresh from the chemical laboratory has been accustomed to make small quantities of oxygen gas in a glass retort, and has been taught that the presence of oxide of manganese facilitates the escape of the O from heated chlorate of potash. He therefore naturally concludes that the more he uses of this black powder the quicker will be the flow of the gas. In preparing large quantities of oxygen, however, for the limelight, he finds that a sixth or an eighth of manganese enables him to fill his bag more quickly and at a lower temperature than when he adds one-half. There is, no doubt, some danger of a "rush," and therefore the tubes must be kept well open from end to end. I myself work in this way because time is an object, and the iron retorts last longer when they are never allowed to get red hot, but I think Mr. Lewis Wright's advice is better for beginners, namely, to proceed cautiously at first, and to use the maximum quantity of black oxide. I am surprised, however, to hear him say that he finds the powdered chlorate to yield less oxygen than the crystals. With me it is quite the other way, and by looking at his figures I see that I get more gas per pound than he does. Perhaps the powdered chlorate he uses has been kept for a time, and has undergone some decomposition in consequence.

I do not recommend an impure sample of chlorate. If retail dealers

would once try the chlorate of potash manufactured wholesale by Messrs. Kuntz & Co., of the Sutton Alkali Works, St. Helen's, Lancashire, they would, I think, be astonished to find that so good an article could be made by one crystallisation, and at a moderate price.

For purifying the gas I employ two common zinc washers of the usual size ($5 \times 4\frac{1}{2}$), with a pint of solution of "washing soda" in each. The entrance tube of the second is closed at the end, and then drilled with half a dozen or more holes one-sixteenth of an inch diameter, like what is called a "rose burner." This prevents water from being driven into the pipes however fast the gas may come over, and the holes do not become choked, as the black powder is deposited in the first washer. Note, however, that rain water should not be used for dissolving the soda, as it often contains organic matter and causes frothing of the liquid.

I have not as yet had an opportunity of trying the addition of "salt" to the oxygen mixture, but hope shortly to do so.

T. FREDERICK HARDWICH.

GELATINE DIRECT POSITIVES.

HAVING undertaken, with a friend, to open a photographic studio in a bazaar for a charity, the question arose how to take a gross or so of quarter-plate portraits in the course of an afternoon, and as far as possible to hand them, finished and framed in trays with mats and preservers, to the sitters before leaving in the evening.

A direct positive process of some kind or other was at once decided upon as the only one sufficiently ready, and the following was the procedure adopted.

The plates (a cheap, thin make of instantaneous gelatino-bromide dry plate was selected) received a very short exposure (but not with a drop shutter). They were developed with ferrous oxalate, the development being stopped as soon as the detail was all out, but while the image was still bright on the surface and the shadows still unclouded. The alum bath and hypo bath were then used as usual, and after a moderate washing the image was bleached with iodine dissolved in solution of potassium iodide (colour of golden sherry). A dilute solution of ammonia after rinsing, or perhaps soaking in water, whitens the image and clears the film from excess of iodine. The plates were then dried and varnished with clear negative varnish, and backed in the frames with black velvet.

It is essential that the development be stopped long before the density suitable for a negative has been attained, otherwise the shadows would not be clear and show the backing well through. For the same reason the exposure should not be sufficient to cloud the shadows in the least.

The iodine solution should not be too strong, otherwise a considerable excess will penetrate into the film, and a prolonged soaking in water or ammonia solution be required, which may injure the result.

The plates may be varnished with black varnish, but unless they be much more strongly developed they will be too dark in colour.

The process may appear too obvious to be worth mentioning, but I have failed to find any convenient process for the utilisation of gelatine plates for direct positives in a text-book or periodical. We had not sufficient confidence in the permanence of an image bleached with bichloride of mercury to risk its employment, though the freedom of the yellowish, creamy colour of the silver iodide gives it at first a more pleasing effect, and Obernetter's process for direct positive images was too complicated, and did not fully succeed in our hands.

The process above described can hardly be surpassed in simplicity, and though, like all direct positive processes, it does not admit of ready multiplication, it possesses other advantages. For a framed landscape it affords rather a pleasing effect, and there may be cases where an amateur may require only one or two copies for framing, which may more easily be obtained directly in the camera than otherwise.

I have not tested it to ascertain whether with shorter exposure than is required for a negative the same details might be secured. If this be so, this, or some other direct positive process, might of value for astronomical subjects.

It should be noted that the iodine solution should be saturated with iodine, there should be no free potassium iodide, otherwise the strength of the image will be impaired.

Rosse.

Athenæum Club, Pall Mall, S.W., June 8, 1887.

THE FOCUS OF LENSES.*

In catalogues one also meets with the term "back focus." This term is of no value whatever, and only represents the distance from the back of the lens to the focus. It is entirely unscientific, and could be neglected without loss to anybody.

The following explains a method often given for obtaining the focus of a combination. We stated above that as the distance between the lens and the object increased, the distance between the lens and the image decreased, and *vice versa*. This is always so, and changing the lens only changes the actual distances, which still remain proportional to each other. If, then, we could get an equation embodying these two distances, from object to the lens, which we will call A, and from the lens to the image, which we will call B, as known, for we can measure them, and the focal length F, as unknown, we could determine this latter. Now this equation is—

$$\frac{1}{B} - \frac{1}{A} = \frac{1}{F} \quad (1)$$

Now if A, the focal distance between the lens and the object, be of an infinite length, and $A = \infty$; $\frac{1}{A} = 0$, and then $\frac{1}{B} = \frac{1}{F}$, that is, the conjugate focus equals the principal focus. We reasoned this fact out in the beginning of this paper.

Equation (1) can be written

$$\frac{A \times B}{A + B} = F \quad (2)$$

and this, or some such form, is given in many books as a good method of obtaining the focal length.

What it practically comes to is, you place a candle or other object at some distance, which you guess to be more than twice the focal length of the lens; then focus it on the glass, measure the distance from the object to the centre of the lens, which can be taken as the diaphragm slot, and the distance from the slot to the ground-glass; then the product of these two distances, divided by their sum, gives the focal length.

For instance, we find the first distance to be 33", and the second 10; the $\frac{33 \times 10}{33 + 10} = \frac{330}{43} = 7''\cdot7$, the focal length of the lens.

But we have been obliged to assume that the diaphragm slot is the optical centre of the combination. This is undoubtedly true in most lenses of the rectilinear type, but in triplet or portrait lenses, without central diaphragms, we must seek a fresh equation.

We remarked above that when you brought the object near to the lens the image receded from the lens. Now, if you continue such a movement, you must come to a position where $A = B$, or the two conjugate focal lengths are equal and equidistant from the lens.

In such a case equation (2) becomes

$$\frac{A}{2} = F \quad (3)$$

that is half the distance from the lens to the image or object, or one-quarter the total distance between the object and the image gives the focal length. Practically you shift the camera and alter the focus till you get the image of the same linear dimensions as the object, for it is a property of lenses that when their focal lengths are equal, the images they form are also equal. This method is very largely used, and has been repeatedly advocated. It possesses but one fault, equation (1), on which it is based, does not take into account the thickness of the lenses themselves, and in cases of short focus lenses, where the thickness is naturally considerable in respect to their focal length, the error may become appreciable. We must, therefore, seek some other method free from this fault.

Now, the result of any lens or series of lenses is, after all, only to alter the angle that the object subtends. This is equivalent to saying that it alters the size, and this size is directly proportional to the focal length. Now, then, if we have a lens of a known focal length F, and we focus some object on the screen, and measure its size Q on the screen, then, with our unknown lens X in the same position, focus the same object on the screen and measure it, P

$$\text{then } Q : P = F : X \quad (4)$$

In practice, if with our known lens of 6" focus, the image Q measures 3", and with our unknown lens the image P = 4", then

$$X = 6'' \times \frac{4}{3} = 8''$$

And this is correct if the objects are distant enough to be considered as parallel rays.

But everybody doesn't possess a lens of accurate known focus, and to meet such a case Mr. Traill Taylor lately proposed an extremely simple and correct method. You focus again two distant objects, and mark on the ground-glass their distance apart. Then

* Concluded from page 345.

remove the lens and replace it by a piece of cardboard with a pinhole in it. As you all know, you will get a view of the scene on the ground-glass, and you shift the ground-glass in and out till the two distant objects are represented the same distance apart as they were with the lens; now the distance from the ground-glass to the pinhole is the focal length of the lens.

I have used the same system myself, only with modified details. I used a view meter, like those sold by Sands & Hunter. I measure, like Mr. Traill Taylor, the distance apart of any two objects as represented on the ground-glass by the unknown lens. Say this is 3". Now, examine the object in the view meter, and slide the front frame in and out till the two objects just fill the field, measure the distance from the frame to the eye; the size of the front frame you know, say it is 2", and the distance you measure and find to be 9".

$$2'' : 3 = 9 : x \text{ the focus required.}$$

$$\therefore x = 13\frac{1}{2}''$$

This system is identical with that of Mr. Taylor, but avoids the pinhole and the slight difficulty there is in seeing any but bright objects, and were the view meter provided with sliding sides, so as to be able to make the front frame equal to the distance between the points taken on the ground-glass, you would only have to measure the distance from the eye to the front frame to obtain at once the focal length.

LYONEL CLARK.

HALATIONS IN NEGATIVES.

CHAPTER III.

It has occurred to me that I have not been sufficiently explicit in my previous remarks respecting the *backing* of bromised dry plates for the prevention of optical halation. After many experimental trials by testing the plates with unnecessarily long exposures on subjects containing strong and abrupt contrasts of light and shade, I adopted the following somewhat indefinite formula for a backing pigment, which fulfilled all my expectations as a preventive of this kind of halation, and at the same time was easily removed from the back of the glass plate previous to development.

Take equal parts of burnt umber (reddish brown pigment) and dextrin (British gum), and intimately mix these with water into a thickish paste — about the consistence of treacle. This mixture is applied to the back of the dry sensitive plates with a broad camel-hair brush. When the pigment has dried they are ready for packing up or for exposure.

If dextrin, or some similar substance, be not mixed with the pigment, some of the particles of the latter are apt to be abraded and deposited on the surface of the sensitive film, where, unless removed previous to exposure, they will certainly give rise to pinholes in the negative. This gummy backing, moreover, is much more easily removed from the glass, previous to development, than would be the case if a simply aqueous mixture were used. Before proceeding to development, a few gentle rubs with a wet cloth or sponge will clear the glass sufficiently well to enable the operator to watch progress by transmitted light and arrest development at the proper time. The late Major Russell was in the habit of employing a broad chisel for scraping off the hard aqueous pigment, until latterly I suggested to him the advantages of mixing the colour with dextrin.

A method adopted by Dr. Hill Norris of finishing his commercial dry plates, was to paste on the back of the glass a piece of thin black paper. This prevented halation to some extent but, as the paper was not in true optical contact, was by no means equal to the plan devised by Russell.

As to the second kind of halation arising from the diffusion of refracted light when passing through the bromised film, I cannot suggest any certain remedy, nor do I think it possible to devise one which would not, if effective for that purpose, entail as great, if not a greater, evil. Staining the film itself, as has been suggested, with a dye impervious to actinic radiations, and one which is washed out in the course of development or subsequent operations, would certainly prevent such lateral and injurious diffusion, but, as has already been pointed out in Chapter I., the remedy would most probably prove worse than the disease. The only available mode of procedure that I can see whereby this kind of halation (*diffusion-halation**) can be greatly reduced, or, at least, ameliorated, is by having a minimum of gelatine and a maximum of bromide in the sensitive pellicle. In cases where small negatives have to be greatly enlarged — to life-size, for instance — this plan would undoubtedly prove beneficial, as a dense negative is not needed, and these are just the class of pictures in which this species of halation

* I have ventured to coin this uncouth compound word for present use in the hope of some one suggesting an equally expressive but more euphonious term.

renders itself particularly conspicuous. In direct photographs it is not very noticeable, unless sharp outlines are inspected with a magnifying glass.

GEORGE DAWSON, M.A., PH.D.

PHOTOGRAPHIC PAPERS AND PAPER MAKERS.

I.

FORTY-FIVE years have elapsed since Fox Talbot brought out the first effective photographic process upon paper, to be quickly followed by the complaints of experimentalists as to the difficulty of obtaining any uniformly trustworthy paper in the market; and as the various paper processes multiplied, so also did the complaints. Herschel, Becquerel, and Hunt, devoted their powers to the examination and testing of various descriptions of papers; nor were they long in discovering that the sizing of the papers had an important and usually beneficial influence, that the most difficult defect to overcome was the presence of minute iron and brass particles, or of specks of metallic oxides in the papers, and that traces of the thiosulphate of soda used to eliminate chlorine after the bleaching of the paper pulp had likewise an injurious effect. They furthermore found out that old papers worked much better than those freshly made, and that unequal absorption of aqueous liquids by a paper was objectionable. The earliest method of examining a new sample of paper was simply to place a sheet of it in water, to take it out after a minute or two, and to hold it between the eye and the light; this at once makes visible, by areas of relative transparency and opacity, to what extent the sheet absorbs water unevenly. To get rid of iron and other metallic spots, a favourite plan was to carefully sponge sheets on both sides with pure water, then to place them in a dish of water with enough nitric acid added to make it slightly sour to the taste; in this weak acid solution it was left for several hours, then was washed for one hour in gently running water. In 1852, Mr. William Crookes published in *Notes and Queries* his method of eliminating iron or brass spots by soaking the paper for two hours in iodide of potassium, one ounce; water, one pint; and enough free iodine to give the solution a sherry colour. In those early times they did not do much in the way of mitigating their difficulties, by coating their papers with special substrata to make them less pervious to aqueous liquids and to keep the photographic image well on the surface, although the waxed-paper processes tended to take this direction.

Another factor had to be considered in those early times about ordinary commercial papers. These sometimes contain foreign matters known as "fillings," which add nothing to the strength or durability of the papers, but increase their weight with or without certain advantages. China clay or kaolin is a favourite substance for the purpose, and it aids in producing a fine surface. Kaolin is not always chemically injurious, but the commoner varieties are liable to contain oxides of iron and other metals, which are bad in that respect. Necessity exists for the abolition of "fillings" in photographic papers, even when not chemically objectionable, because now we have processes which produce pictures more imperishable than any paper upon which they can be printed, so that the amount of permanency of the proofs for historical purposes rests in reality with the paper manufacturer. Cotton fabrics loaded with kaolin have been turned out in Manchester to such an extent as to have largely destroyed the British trade in cotton goods with certain barbarian and Eastern countries, to the great advantage of foreign competitors, and that which renders articles of clothing less durable cannot increase the quality of papers. A photographer who finds "fillings" in his paper has a right to go to the manufacturer and to say, "Your supply contains foreign matters which should be absent," as the dry-plate maker remarked to the water-rate collector when he discovered that he had stewed a frog in his emulsion.

From the first dawn of photography down to the present moment, so far as the manufacture of English papers is concerned, little or no improvement has been made, and any paper turned out at English mills is used, if at all, with innate misgivings by photographers. The effect of this is that thousands of pounds a-year are sent out of this country for the purchase of foreign papers for photographic purposes, made chiefly by two Continental firms, who long ago began to exert themselves to meet a public want. For some time the English makers of gelatine ignored the requirements of photographers after the gelatino-bromide dry plates came into vogue, and only when they discovered that photographic plate makers were buying gelatine from the Continent by the ton did they enter into the competition, but too late to more than partially divert the trade already established. The weight of paper consumed in photography must be infinitely greater than that of gelatine, and the recent great influx of amateurs, by reason of the easiness of the new negative processes, must have given

an additional impetus to the consumption. If any means exist of ascertaining and giving a rough idea of the weight of photographic papers consumed annually in this country, it would be of interest to any English manufacturer who had an idea to trying to meet some of the demand, so that any information the readers of these pages can give upon this point would be of value. A few months ago one of the oldest and most noted photographers in this country, Mr. William England, remarked, while presiding over a meeting of the Photographic Society of Great Britain, that it was a remarkable thing that so much capital has to be sent regularly out of the country for foreign papers, and probably every English photographer is of the same opinion.

My interest in this subject was awakened by the fact that I was practically working out some new iron processes, also some new platinum processes both with and without the conjunction of iron salts, and was impeded in getting good results, in a pictorial sense, by the eccentricity of the effects given by different samples of English papers, and it is hard that scientific research should be retarded by such simple mechanical and commercial obstructions. I bought, at first, a quire of one of the good foreign photographic papers, and found it useless for my purpose, because it was too thin, so that after being soaked in a liquid it would break with its own weight when pinned up to dry. On comparing its retail price with those of some first-rate English vellum-wove papers made from good cotton cellulose, I found that the foreign paper was from four to six times the price for equal weights; for be it remembered that papers are bought and sold by weight, unless in very small quantities. Instead of getting a thicker foreign paper, I resolved to turn aside from the research in hand to learn something about the manufacture of papers, to find out to what extent the prevalent objections to English papers are well-founded, to what extent the objections are merely superstitions because of lack of investigation, and to what extent some defects in home papers can be remedied without difficulty. As the inquiries have gone on, the subject has increased in interest, until at last I do not regret having had to investigate this matter, for the experience gained will always be of use. Just as in engineering it is required that the student shall first go through the drudgery of the workshop, that he may afterwards be the better qualified to perform the higher duties of an engineer, so in photography nothing is lost in the long run by acquiring knowledge about varieties of paper and their methods of manufacture, into which subjects I intend to plunge in the present series of articles.

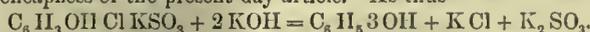
W. H. HARRISON.

escaped notice. Such bodies are described in chemical language as isomeric. Theoretically, as regards pyrogallol, we find there should be really three bodies having the formula C_6H_3O . All these three bodies have been isolated, and in appearance closely resemble one another. I think here is a field for experiment and research opened up. How could these bodies act as developers?

I have broken the ice a little myself, but not with any satisfactory results as yet; chiefly because, owing to *fitting*, like many others at this season, my dark room is not, I am afraid, quite light-tight as yet, and as my experiments ended, not in smoke, but in fog, I am at a loss whether to attribute it to developer, light, or a combination of either—combined, of course, with the uncertainty of working always connected with new developers.

As regards the names of these others, the pyro, pyrogallol, phloroglucinol, hydroxyquinol, I may say they all act as developers; that is, they are reducing agents.

During the time I have practised photography, pyrogallol has undergone two transformations—one in form, the other in price. As a schoolboy I amused myself and tortured my friends with photography, and I well remember having to save out of two weeks' pocket-money whenever I wanted to indulge in pyro. If I remember aright, I paid sixpence for about thirty grains. After leaving school I gave up the art, for I neither had time nor could I carry the enormous amount of paraphernalia about with me when a student. A few years ago, however, I could not refrain from returning to the old love, and commenced by reading up the elements of modern dry-plate photography. I must admit that when I found my old bugbear pyro was the favourite developer, I thought of the expense, but soon discovered that what I formerly bought by the grain, I could now purchase by the ounce without any considerable fortune to back up the expenditure. I enjoyed the luxury of purchasing a whole ounce of pyro, and then found that along with a transformation of price there was one in form. What I purchased as a boy was more compact and less feathery than what we are now familiar with. Formerly I knew it was made by heating gallic acid (hence, in fact, the name) until it lost carboic acid. Considering the price at which it is now sold, I cannot believe that it is made in this way in the present day. I have made some inquiries as to the German method by which pyro is made, but cannot procure any definite or reliable information; the process seems to be very much a secret. There are a number of ways of making it artificially, but only one, to my mind, would account for the cheapness of the present-day article. As thus—



Whether this is the method adopted I cannot say, but of one thing I am certain, that it is not made from gallic acid.

All bodies allied to carboic acid—or the phenols, as they are termed—have the power of absorbing oxygen to varying extents. Phenol turns red on exposure to air; pyro turns brown. In chemical language, they are reducing agents, some more powerful than others. Now, what we call development consists in reducing the salts of silver to the metallic state after they have undergone some change by light; what that change is I do not think any of us can say. The latent image is at present an unexplained mystery. That the change is wholly chemical I do not believe. Be that as it may, a reducing agent applied to an exposed plate has the power of reducing to the metallic state those portions of the silver salt which have received the actinic rays. Used by itself it acts with great slowness, but in presence of an alkali, which absorbs the halogen set free, the action is rapid.

In the chemical laboratory, we use pyro to absorb oxygen in gas analysis, always in alkaline solution.

As you all know, the question of which alkali to use is a somewhat vexed one. Chemically speaking, I cannot see that it matters which alkali is taken; the final result is much the same, although the one developer may produce that result quicker than another.

We are all apt to overlook the fact that a process that succeeds with one man will not do with another. I should say, let each one use the alkali which suits him best, and with which he gets the best results.

As to the unhealthiness of ammonia I am doubtful. The small quantity given off during development I cannot bring myself to believe is hurtful, notwithstanding all that is said to the contrary. I am acquainted with chemical works in which ammonia fumes are constantly present, and in which the workmen are healthy enough. In my own laboratory I have frequently had more ammonia flying about than ever I had in my dark room.

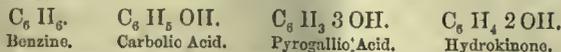
My experience in the matter may not be of much value, but I have tried all the three alkalies, and can develop equally well with either. Soda alone, however, with me gives a red tone, which is rather misleading when judging of printing value.

PYROGALLIC ACID AND ITS USES IN PHOTOGRAPHY.

[A Communication to the Edinburgh Photographic Society.]

THE first point that strikes me is the misnomer "pyrogallol," for what we know as pyrogallol is not an acid, but an alcohol. Some time ago, reading a short article on development in one of the *Year-books*, I was amused to find how the writer strongly insisted on the acid nature of pyro. He was trying to prove that all our development was really acid development—that no matter how much alkali we used, we also had to use an excess of acid before it would act, the acid being either citric, sulphurous, or (save the mark!) pyrogallol.

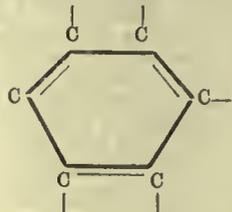
Without stopping to consider the rather novel views on development enunciated by this writer, I must say that it is a *reductio ad absurdum* proof, seeing that the argument is really based on pyro being a body, and having the properties of an acid, whilst in reality it is of no such nature. Pyrogallol, as it should be more correctly termed, belongs to the same group of organic compounds as carboic acid—also misnamed, by-the-by. They are both alcohols derived from benzene or benzole.



Scientific chemists are fond of speculating as to the arrangements of atoms composing the group, and in the benzene series we have every reason to suppose atoms are arranged and connected one with another in such a way that each earlier atom has the same relation to the other. The graphic method adopted to show this is this:—

Now it is possible, assuming our theories to be correct, to prophesy how many bodies can be produced having the same formulæ, and these prophecies stand more chance of being fulfilled than those of a sporting prophet on the Derby.

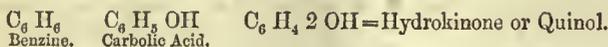
These theories have been proved to be correct, and many new bodies have been discovered in consequence, which might otherwise have



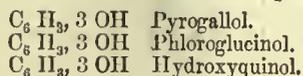
One thing I never do—that is, keep pyro in solution. To my chemical mind it is impossible to keep it in solution for many seconds without change taking place. When the brown colour is developed after absorbing oxygen a number of complex bodies are present, including acetic acid, carbolic acid, &c. Both of these bodies act as restrainers, besides destroying a large quantity of alkali. In fact, the sulphurous acid is the most powerful restrainer I know of. I have saved over exposed plates with a solution of sodium sulphite saturated with sulphurous acid gas, when I do not think I could have done anything with bromide. But sulphurous acid is as unstable a body as pyro. It tends to become sulphuric, or the sulphite to sulphate, and after that stage the solution is useless. I always use pyro dry, and nothing will ever make me change except the introduction of a hitherto unknown preservative. For professional photographers using large quantities of pyro it may not matter so much, but to my fellow amateurs I advise that they should avoid solutions of pyro.

Now a word or two as to the other compounds alluded to in the earlier part of my paper. Phloroglucinol: I procured a small quantity from a benzine compound, and attempted to use it as a developer. It began to develop a picture without any alkali, but almost immediately fog appeared. You could not use ammonia with this body without it undergoing change, but the new substance produced will act as a developer. In my only experiment fog was produced at once; this proves that it has the power, and I have no doubt careful experiment would show us a method by which it might be used. Hydroxyquinol, the other body referred to, I have not had time to make, but I should say that it was even more powerful than either of the other two ferns.

Now, I will ask you to observe one thing, namely, the close relationship between these bodies:—



$\text{C}_6\text{H}_4\text{2OH}$ Catechol,
found in the autumn leaves of the Virginia creeper.



T. W. DRINKWATER.

SULPHURATION OF PRINTS.

GELATINE EMULSION PAPERS.

My next series of experiments were with developed prints on various papers coated with gelatine and a silver haloid, against albumenised paper and platinum prints. As the deterioration of albumenised paper prints in the earlier stages is far more due to the yellowing of the whites than to the fading of the images, it was necessary to see if this yellowing would take place when the paper was coated with an emulsion not containing any free silver; at the same time, if there were any yellowing it would be necessary to find out if it were due to something in the paper itself or to a discolouration of the emulsion film on its surface. I may say that I have already commenced a series of experiments in somewhat the same direction as that mentioned in a leaderette in a recent issue of the JOURNAL.

I am trying to discover if there be anything else than bichloride of mercury (a salt for several reasons I would like to do without if possible) which will remove the yellow colour in the high lights of a faded albumenised print. If there is, to see how prints so treated (as well as some prints treated with bichloride of mercury) will afterwards stand against an atmosphere of sulphuretted hydrogen; and then try to find if, by treating freshly prepared albumenised prints in the same way with bichloride of mercury, &c., whether the latter will, by destroying the producing agent of this yellowing of the prints, prevent any such fading action taking place. Printing out gives us such enormous facilities for producing the most satisfactory work, that any amount of trouble might be given to solve these problems.

We know that the papers of many old engravings exposed to light and air have yellowed considerably, and if photographic prints did not yellow any sooner or worse than those, practically we might rest perfectly satisfied; but, unfortunately, we are as yet far from that standard.

For my experiments I took about twenty different samples of papers. It may not be waste of space if I state what they were, because any of your readers who think of making their own bromide papers might like to know what papers can be used which will stand a prolonged exposure to sulphuretted hydrogen without changing colour.

The following were, as far as I could see, perfectly unchanged after a week's exposure in a (humid) atmosphere of sulphuretted hydrogen:—Whatman's hand-made drawing papers; Waterlow's machine-made drawing papers in various sizes from $17 \times 13\frac{1}{2}$ to 40×27 ; Waterlow's Turkey Mill drawing papers in the same sizes; Rives's photographic paper; Waterlow's continuous drawing cartridge, fifty-four inches wide; Whatman's double elephant and imperial drawing cartridge; Waterlow's machine-made cartridge, twenty-six inches by twenty-one inches to forty-four inches by twenty-nine inches.

One of my great objections to many of the bromide and platinum prints I have seen is the chalky whites of the paper, and that is why I tested the cartridge papers. The colour of these is quite different to the yellow tint of faded albumenised paper or platinum prints, and I know many photographic people who would be very pleased if they could purchase bromide papers of a warmer tint than those now sold.

After settling the question of the paper, the next stage was to find if there were likely to be any discolouration in the whites of the prints due to invisible chemical combinations formed before or during development, &c., which would only show itself after prolonged exposure to the light and air. This subject is quite distinct from any fading or change of colour of the silver forming the image. To test this I coated pieces of the above-mentioned papers with gelatino-silver-bromide emulsions (with various proportions of gelatine and silver), and without exposing them to light passed them through the developing and fixing baths, and washed them well. I also took masked portions of prints on "Alpha," "Argentotype," "Eastman," and platinum papers, either produced by the firms manufacturing the papers themselves, or by their acknowledged representatives, some masked portions of albumenised paper prints, some Monckhoven's double enamelled transfer paper used for carbon printing, and a steel engraving from the *Art Journal*.

These were all subjected for nine days to sulphuretted hydrogen in a glass bottle, in the centre of which was a sponge full of water to produce a humid atmosphere. The albumenised papers, of course, had yellowed considerably, the platinum ones were nearly as bad, the enamelled transfer paper had also yellowed slightly, but the Alpha, Argentotype, Eastman, and my own bromide papers were apparently unchanged, as well as the engraving. So we see that as far as the whites in our photographic prints are concerned, coating the papers with emulsion instead of floating them on a nitrate of silver bath is a great step in advance as regards the permanence of their purity, even when organic salts of silver are in the emulsion.

And now for the permanence of the images on these various papers, prints upon each being subjected to the same test. The albumenised paper prints had, of course, faded terribly, those printed from the densest negatives standing much the best. The images on the Alpha paper had faded to a yellow colour, but did not appear so bad as the albumenised paper prints, because the whites had kept pure. The lightest tints were lost. The Argentotype prints had lost a little in density, and had changed from a dense black to a much warmer and not at all an unpleasing colour; indeed, for many subjects it would be an improvement on the original cold black. The half tones were not injured, and the whites were apparently unchanged. The images of the platinum prints were of course unchanged, but the prints had deteriorated a good deal in appearance through the yellowing of the surface of the paper. This can be removed by chlorine water, and I intend to try by putting a fresh prepared platinum print into chlorine water whether the latter will destroy the producing cause and prevent any future yellowing of the print by sulphuretted hydrogen. If it will, it will only be necessary to pass the prints through chlorine water, and wash them before mounting.

My own bromide prints gave various results, I believe due to the different proportions of iron and oxalate of potash used in the development; but it will be necessary to carry out a fresh series of experiments to solve this question. Some of them were as nearly as possible identical with the Argentotype prints, others had changed to a sepia colour, but in none of them had the lightest tints been destroyed, and the whites were very pure.

Undoubtedly, in my hands the Eastman prints stood the best of them all, taking into consideration the purity of the whites and the density and colour of the blacks and half tones. Indeed, the same sulphuration test which practically destroyed the albumenised paper prints, and had changed the others as I have mentioned, had improved the Eastman prints, because it had given a slightly richer and warmer tone to the blacks without the slightest reduction of their density.

Were they not produced by a blind process requiring development, I would consider that the Eastman Company had solved the problem

of photographic printing. If we could only get the same results by *printing out*, it would be good-bye to all others, at least as far as I am concerned.

HERBERT S. STARNES.

DALE ABBEY.

[A Communication to the Derby Photographic Society.]

Fifty years ago, Richard Howitt, the poet, a native of the neighbouring village of Heanor, wrote some verses entitled *The Hermit of Dale*, in which he says:—

“O Deepdale! lovely is thy land
With pasturing herd and flock;
And lovely is thy Hermitage,
Cut in the solid rock.

“A cheerful place of healthful life—
A spot of Nature's love;
With greenest grass up to the door,
And crowned with trees above.

“With that one arch before thee set—
That one old Abbey window fair;
The only wreck of the rich Fane
That restless time would spare.”

And there is little change here to this day. Dale Abbey lies buried amongst the woods and fields in a secluded valley, far away from the “madding crowd;” and though the Great Northern Railway has made it more accessible than heretofore, there is a quaintness about it speaking of the past, and realising the idea of an old English village enjoying the calm and tranquility of bygone years. It is true that the grey old guest-house disappeared nearly four years ago to make room for the present building—a change to be deplored by every lover of the beautiful, especially as it might have been carefully repaired, and its old form and features retained. You will see by these photographs—some of them taken only just *one* day before the work of destruction commenced—what a charming old place it was. The field where stands the old Abbey window has been excavated, and the foundations of the walls, pillars, &c., exposed to view, increasing our knowledge of the building, and bringing to light many matters with which we were not previously acquainted. The old yew-trees, coeval with the sacred edifice near which they stood, have gradually disappeared, and not a vestige of them now remains. I have brought photographs of these subjects, taken before and after the diggings. The churchyard was formerly hedged round on the north and west sides, and the brook connecting the old fishponds was crossed by a little ford and a plank footbridge, instead of the arched bridge as now. For nearly half a century have I made constant pilgrimages to Dale Abbey, and these are the principal changes I note. The old-world place remains much as it was when the poet wrote—

“Here, as to all the world unknown,
A sage seclusion dost thou keep;
And here Antiquity enjoys
A deep and mossy sleep.”

This seclusion was somewhat rudely, though reverently, disturbed on the 9th of September, 1878, by some of the members of the Derbyshire Archaeological Society, when the excavations commenced, and were again renewed on the 2nd of July in the following year. The results of our labours—for I was one of the disturbers—you will see on the site, and those who take interest in archaeological matters may find an account of our diggings in Vols I. and II. of the Society's *Journal*.

The Abbey of the Blessed Virgin Mary at Dale was founded about 1160, by Serlo de Grendon, Lord of Bradley, as a Monastery of Austin Canons, who were afterwards replaced by Præmonstratensians. Indeed, there were many changes which I have not time to tell of. Some of the canons, being idle and addicted to the pleasures of the chase, were turned out by the King; others could not live there in poverty, after hunting the deer was stopped, so returned to their former homes. Towards the close of the twelfth century, however, some members of the De Grendon family endowed the monastery, and placed it in charge of nine canons from Newhouse, in Lincolnshire; and from this time, under eighteen successive abbots, the place prospered and increased in wealth and lands, and at the dissolution of monasteries, in 1539, it had sixteen canons with a yearly revenue of £144 4s., equal to about £3000 at the present time. The original structure has almost entirely disappeared, and the remains you now see are parts of a magnificent building begun about the year 1200, with later additions extending over nearly two centuries. We shall not have time for a detailed description, for I must say a few words about the Hermitage on the hillside yonder; suffice it, that the Abbey of Dale was once a noble building of great extent and beauty, as you may judge from the disclosed foundations, the grand old window-arch, and other remnants still standing *in situ*—as parts of the kitchen and the gate-house.

One of the canons of the Abbey has left us a most interesting chronicle, the original of which is in the British Museum. A good translation of it will be found in Glover's *History of Derbyshire*. This canon, Thomas de Musca, divides his chronicle into thirteen chapters, each beginning with

one of the letters of his name, forming a sort of acrostic. Chapter III., “Concerning the Baker who became a Hermit; the First Inhabitant of Deepdale,” gives an account of the origin of the Hermitage, as related to him by “a noble matron, the Lady Matilda de Salicosa-Mara,” one of the founders of the monastery. I wish there was time to give this legend in his own words. It relates that a baker of Derby, Cornelius by name, and living in the parish of St. Mary, “a religious man, fearing the Lord, and much intent upon alms and good works,” fell asleep “on a certain day in autumn” at the hour of noon, when the Blessed Virgin Mary appeared unto him in a vision, and bade him, if he were disposed to become a perfect man, to leave all his worldly possessions behind him, and go to Deepdale, thence to serve her and her Son in solitude. He was miraculously directed to the place, to which he was previously an entire stranger, by a maiden, whose mother he overheard directing her to drive some calves there. He found it a cold, marshy, and desolate place, and here “he served God day and night, in hunger and thirst, in cold and meditation.”

“Here in the hollow oak he made
His dwelling night and day,
Whilst he with unrelenting hands
The hard rock cut away.”

I need not describe the Hermitage, for you have seen it, and got some good views of it too, I hope. The country round about is much changed since the Derby baker came here, but the Hermitage is very little altered, though a stockinger did once make it his home. The surrounding trees are of comparatively recent growth, but here and there you will find a hoary trunk, the last lingering relics of the primeval woods. In the dim old days of which I have been speaking, the valley of Deepdale was a wild and lonely spot in the midst of a great forest extending from Derby almost to Nottingham—well stocked, we may imagine, with deer and other wild animals. However that may be, “a certain potent lord, of the name of Radalphus, the son of Gremund, and lord of the meity of lands of Ockebrook and Alvaston,” returning from Normandy, took it into his head to have a little sport in these woods, and whilst hunting, was attracted by the smoke of the poor hermit's fire curling up through the trees, and wished to know who dared, without license, make a “mansion” in his forest. But on seeing the wretched Cornelius, clothed in rags and skins, he was “smitten at the heart,” and granted him the place, together with the tithes of the mill at Borrowash, for his sustenance. Here he battled bravely with the devil, who envied this good man his peaceful and religious life. Cornelius also suffered greatly from the want of water, and discovered a spring in the deeper valley, close by which he built an oratory in honour of God and the Blessed Virgin, where “he wore away the sufferings of his life, laudably, in the service of God.” The well is still to be seen at the bottom of the orchard, to the north-east of the church, and is still known as the Hermit's Well. Another legend in the same chronicle relates how the site of the Abbey was fixed upon through the vision of “one Uthlagus, a very famous man,” who was sleeping and dreaming on Lyndersyke, the hill you see to the west of the Abbey, when he beheld a golden cross standing in that spot where the foundation was afterwards laid.

There is a tradition extant amongst the inhabitants of Dale, that so long as the Abbey arch stands they are exempted from payment of tithes. Another, that treasure of great value lies buried in the Abbey fields, though we came not across it in our diggings; graves there were in plenty,* and archaeological treasures not a few, but no treasure-trove! The last and most popular legend I shall give you, is that telling of how the King granted to the Abbot of Dale as much land as he could encircle in one day with a plough drawn by deer caught in the forest, as shown in one of the windows in Morley Church, removed from Dale. This window, however, represents the well-known story of St. Robert of Knaresborough, and once adorned the refectory of Dale Abbey.

The quaint old church here, one of the very smallest in England, boasts of great antiquity, and is on the site of the oratory built by the hermit, if, indeed, some parts of it are not of the original structure; and small though it be, you have seen that it has a nave, chancel, side aisle, screen, and gallery—the latter of comparatively recent construction, and reached by steps on the *outside* of the building. The pulpit in the corner is certainly not of the “Perpendicular” order, the communion-table is unique, and the bishop's chair quite a Brobdingnagian feature in this Lilliputian church. The font, after various vicissitudes, has settled at last in the east end of the aisle. I remember the time when it did duty as a flower-pot in the vicar's garden at Stanton; then it was brought here and placed in the north-west corner of the churchyard, close by the gate; and, finally, came to rest in its present position. The carving on two of its sides of the Virgin and Child, and the Crucifixion, is of good design and execution. This font belonged to the Abbey. The guest-house next door once seemed to form part and parcel of this sacred edifice, as you may see in these old photographs, and the writer of *All About Derbyshire* says, “I defy you to decide where the church ends and the house begins.” There no such difficulty now. In the old house you might have seen a blocked-up doorway, once opening into the church. It was closed because

* “I have heard it said by a man of veracity, worthy of belief, that more than four hundred warriors lie buried in that place, setting aside others of the nobility and gentry, and a prodigious number of common people.”—*Chronicle of Thomas de Musca*, VIII., 6.

the singers and others sometimes got tipsy. For you must know it was a public-house at the beginning of this century called the "Blue Bell." I have seen the signboard.

And now I must close my rambling recollections by telling you that relics of the Abbey exist at Radbourne, Chaddesden, and Morley churches. In the latter are the interesting series of stained glass windows I have before named. Morley and Breadsall would make another good afternoon's work for us, as some pretty bits could be got at either place, though the latter has suffered much from an artist's point of view since the railway station perched itself there. I do not go so far as Rnskin in my distaste for railways—for do they not carry us easily and cheaply to places we should never have dreamt of seeing without their aid?—but I would recommend you to hasten with your cameras to any historical or lovely spot when it is threatened with a railway station for its near neighbour, for as surely as it is built, so surely will hordes of trippers devastate the neighbourhood, and ugly houses rise around to deform the landscape. Just one more piece of advice and I am done. Photograph any and every old church or other ancient building you may come across before the "restorers" fall upon it and take away its beauty. Long may it be before the rude old church of Dale is "restored" and revived, or destroyed as the adjoining house has been!

RICHARD KEENE.

LITHOGRAPHY IN HALF TONE.

HUSBAND'S PAPYRINT.

THIS process is specially adapted for the reproduction of subjects in half tone, such as architectural drawings in monochrome, or subjects from nature, and it is inexpensive. Its advantages over other methods of half-tone photo-lithography are, that a transfer can be taken in greasy ink, for transfer to stone or zinc, direct from any negative, however large, without the aid of a medium, the grain or reticulation being obtained simply by a chemical change. The transfer paper being in direct contact with the negative, the resulting prints are sharper than by those processes where interposed media are used; whilst the same negative will answer either for a silver print, platinotype, or a transfer for zinc or stone. The advantage of being able to use a non-reversed negative is very great now that gelatine plates have so largely superseded those made with collodion.

The method of manipulation is as follows:—Any good surfaced paper is floated on a bath composed of—

Gelatine (Nelson's flake).....	8 ounces.
Glycerine	1½ "
Chloride of sodium (common salt)	2 "
Water.....	50 "

Great care should be taken that the solution is not overheated, and that the paper is coated without bubbles. It is then dried in a temperature of 60° Fahr. The paper will take about ten hours to dry, and in this state will keep for years. When required for use, it should be sensitised by floating, or immersing, in a bath of—

Bichromate of potash	1 ounce.
Chloride of sodium	½ "
Ferricyanide of potassium	100 grains.
Water	30 ounces.

This need not be done in the dark room, as the solution is not sensitive to light.

The paper, after sensitising, is dried in a temperature of 70°, and in a dark room. When dry, it is exposed under any half-tone negative, in the ordinary printing frame. It is preferable to print in sunlight, and, for negatives of medium density, an exposure of three minutes is required; but the exposure will vary according to the density of the negative. The correct time of exposure can best be judged by looking at the print in the frame. When the image appears on the transfer paper, of a dark fawn colour on a yellow ground the transfer is sufficiently printed. It is put into a bath of cold water for about ten minutes, until the soluble gelatine has taken up its full quantity of water; then taken out, placed on a flat piece of stone, glass, or zinc plate, and the surface dried with blotting-paper.

The action of the light has been to render the parts to which it has penetrated through the negative partly insoluble, and at the same time granulated. A hard transfer ink is now used, composed of—

White virgin wax.....	½ ounce.
Stearine.....	½ "
Common resin	½ "

These are melted together in a crucible over a small gas jet, and to them are added four ounces of chalk printing ink, and the mixture reduced to the consistency of cream with spirits of turpentine. A soft sponge is saturated with this mixture, and rubbed gently over the exposed paper (in this stage the nature of the grain can be best seen). An ordinary letterpress roller, charged with a little ink from the inking slab, is then passed over the transfer, causing the ink to adhere firmly to the parts affected by the light, and removing it from the parts unacted upon. It will be found that with practice, rolling slowly and carefully as a letterpress printer would his forme, the ink will be removed by the roller according to the action that has taken place by light, leaving the shadows

fully charged with ink, and the high lights almost clear, the result being a grained transfer in greasy ink. The transfer is next put into a weak bath of tannin and bichromate of potash for a few minutes, and when taken out the surplus solution should be carefully dried off between clean sheets of blotting-paper. The transfer is hung up to dry, and, when thoroughly dry, the whole of the still sensitive surface should be exposed to light for about two minutes. A weak solution of oxalic acid should be used for damping the transfer (about 1 in 100), and this should be applied to the back of the transfer with a soft sponge. After it has been damped about four times, it should be carefully put between clean sheets of blotting-paper, and the surplus moisture removed. A cold polished stone is then set in the press, and after everything is ready the transfer is placed on the stone and pulled through twice. The stone or scraper is then reversed, and the transfer is again twice pulled through. A moderate pressure and a hard backing sheet should be used, care being taken not to increase the pressure after the first pull through. The transfer is taken from the stone without damping, when it will be found that the ink has left the paper clean. Gum up the stone in the usual way, but if possible let the transfer remain a few hours before rolling up. Do not wash it out with turpentine, and use middle varnish to thin down the ink.

It should have been mentioned that varying degrees of fineness of grain can be given to the transfer by adding a little more ferricyanide of potassium in the sensitising solution, and drying the transfer paper at a higher temperature, or by heating the paper a little before exposure, or by adding a little hot water to the cold-water bath, after the transfer has been fully exposed; the higher the temperature of the water the coarser the grain will be. The finer grain is best suited to negatives from nature, when a considerable amount of detail has to be shown.

The coarse grain is best for subjects in monochrome, or large negatives from nature, of architecture, &c., where the detail is not so small. Even from the finer grain several hundred copies can be pulled, as many as 1200 having been pulled from a single transfer, and this one would have produced a great many more if required.

—*Photographic Journal.*

WHERE I WENT WITH THE CAMERA.

NO. VIII.—ANTWERP.

My next stay was at Antwerp, and the last on the journey. It is a sea port of considerable importance. Away down by the harbour, with its miles of shipping and intersecting canals, there is a breezy, open, free air, that smells of tar, and ropes, and ships—the very atmosphere suggesting the sea. In this district, down by the quays, very interesting studies in marine subjects are to be had on every hand. The city itself is rich in historical associations, fine streets, notable churches, and valuable paintings. In some of the old, out-of-the-way streets I found good pictures—Catholic shrines in baserelief and faded colourings, quaint, old, and decayed places where devotees used to kneel and pray now passed by unheedingly; that which in former days was approached with love and reverence, now left rotting over cellar doors.

St. Paul's of Calvary is a church that contains within its grounds some original features for the camera. The story of the Crucifixion is rendered in rough sculpture built up in the grounds of this church, with rocks for hills and figures life-size; under the Hill of Calvary, in a cave, is placed the body of Christ lying in the sepulchre. With the exception of this latter, which is in considerable darkness, all the other scenes depicted are out in the open and can be easily photographed. The cathedral of Antwerp is known all over the world for its magnificence as a building, and for the wealth of paintings covering its walls. It is in rather a confined situation for making effective pictures.

From the spire of this cathedral Quintin Matsys is said to have fallen and been killed—falling close to the iron ornamental fountain that he himself had made, and which now stands in the square. He is said to have been up repairing the spire; but I fancy that this must be a fable, for he never seems to have done blacksmith work after he became an artist. It is said that it was the power of love that made him leave the anvil for the brush, and his success was so complete that he gained the lady and, as an artist, world-wide fame.

Points of interest, such as the Museum, the Rubens' pictures, Rubens' house, the Stadthouse, &c., cannot be well overlooked by any visitor; but there is a small museum at Antwerp that I would like specially to draw attention to, if ever you visit this city. It is called the "Plantin Museum." In these days of photo-mechanical printing and engraving by all the various processes—to all who take an interest in such departments—this museum will be found a special attraction; not that the printing or processes here have anything to do with photography, but as one of the handmaidens of the past, showing what had been done in those early days in engraving and printing, the collection will be found wonderfully interesting.

First copies of books, designs, illuminated alphabets, engravings, copperplates, woodcuts, original manuscripts, and autographs, dating back to the fifteenth century, and all gathered together in the house that was Plantin's home. It seems like a fairy tale. Upstairs and downstairs, flat after flat, as his stores of treasures grew upon him he still added

parts to his house, and here, in the nineteenth century, you will find the rooms he lived in just as he inhabited them in the sixteenth. The bedroom—and the bed still there—the kitchen, and the tools he used to work with, the library and the books he used to read. And the marvel is, that how, in the midst of such a checkered life, Christopher Plantin was enabled to build this monument for himself, which will last as long as his country and its people.

Christopher Plantin may be said never to have had any money but what he himself made. When quite a lad his father left him at Paris to get his education, and seeming to forget all about him left him for good. As the school fees were never forthcoming, and the boy was thrown on his own resources, he was compelled to leave school, and got a situation as assistant to Robert Mace, a printer of some note, at Caen, Normandy. Here he resided for some years, and here seems to have been born that intense love for books. However, he laid it aside for a time, for, coming to Paris, he started a business to emboss leather, and gild and illuminate it, for bookbinding and kindred works. He came to Antwerp in 1549, and made it the city of his adoption, continuing here for a time this business of leather dressing, bookbinding, and jewel-case making, and gained a very high reputation for gilding and enamelling on leather.

At this time an accident occurred that changed the current of his life. One night, in the darkness, Plantin was taking home a small jewel case which had been specially ordered by Gabriel de Cayns, Secretary to Philip II.; so particular was it that Plantin had been desired to bring it himself. On the way he was set upon by several men masked and armed, and left on the ground wounded and nearly dead. The masked party had been waiting in ambush to attack an enemy expected to pass that way, and Plantin being mistaken for their victim was cut down. No sooner did the perpetrators of the deed see their mistake than they fled. He was so ill after this encounter that he was unable to resume his business, and falling back upon his knowledge of printing began that as his trade for the future. He was not long at this new employment, however, before he was accused of publishing heterodox works, and for safety he fled to Paris, where, one of a company, he for some years carried on a printing business. Heterodoxy here also seemed to make living unsafe, and he renounced the company and chose an orthodox pathway for the future, returning to Antwerp. In 1567 he published a Bible according to the authorised version of the Council of Trent, and by the Pope's authority he was privileged to sell it; but trade being unsatisfactory he left Antwerp again, and did not return till 1585, when he stayed for good.

The King gave him very extensive orders, which he would have been better without, for he never paid anything for them, neither to Christopher Plantin nor his successors. The King also awarded Plantin a pension, but it never was forthcoming. The money to pay it was to be obtained from the confiscated estates of the Prince of Ghent, but the estates were given back, and hence the source from which the pension was to flow being dried up he never got it.

And still, amidst all these vicissitudes, he managed to build up this collection, so wonderful in its completeness, in this house where he lived and died, and which the family, generation after generation, have cared for and kept on till 1876, when it was bought and became one of the institutions of the country. Do not miss going to see it. It will be a day well spent.

I got on board the boat at Antwerp, and being early put up my camera and made a few exposures. I then packed up my traps and laid them away. In the cool of the summer evening, sitting on the deck as we sailed homeward, I was looking over the pages of my diary of the past few weeks before I closed the journal, and the variety of people one meets struck me as strange as the variety of places. I find noted:—

"In the carriage in which I am comfortably seated there is rather an eccentric young (?) lady. She talks loud and lets everybody know her business. She is bound for the Hague. She insists on filling up the window as she talks on. The old man outside, who looks like a battered ruin, is her father. She pulls a cigarette case out of her pocket and insists upon his taking one; she next furnishes a match box and lights it for him. 'And now, pa,' says the giddy soul, 'my book will be published in a fortnight; the first issue is thirty thousand copies, and, remember, pa, when I come back it will be out, and won't we have such a day at Brighton.' Again and again the old man was assured of that till the train started.

"In the corner of the carriage sat a ponderous daughter of Israel, whose only travelling gear seemed to be a little handbag. Some Jewish people saw her away, and she talked with every questionable character on the journey. In the boat she preferred the storage to the cabin, and talked and chatted with every servant on the route. She was evidently doing business, but whether in diamonds or rabbits' skins one could not guess.

"The young lady with the spectacles is going to Germany to work as English governess—and in return they are going to *finish* her,' she says.

"On the train over here I met the Christmas-card man, who had travelled with his wares as far as St. Petersburg, and who was now on his way home to Berlin.

"I saw a little Frenchman who had travelled all the way from Moscow, and in that second-class carriage; he had been three days and three

nights without stoppage, and as he was going on to Paris he had another twelve hours to travel. He had gone this journey sixteen times already, and he was not yet twenty-four years of age.

"The cheery priest from Ireland with his dull pupil I met doing the journey to Rome. The English nobleman in disguise I met—he who sits reading what he would have you believe were State despatches, and haw, haws, all round, filling up the carriage with what the Irishman calls promiscuous ostentation."

It is getting dark. I close the book.

MARK OUTE.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 8132.—"Improvements in Photographic Apparatus." Communicated by M. Carquero. E. DE PASS.—Dated June 6, 1887.

PATENTS COMPLETED.

IMPROVEMENTS IN VIGNETTE PAPERS FOR PHOTOGRAPHY.

No. 9155. GEORGE JOSEPH SERSHALL, 371, Lodge-road, Hockley, Birmingham. July 14, 1886.

THIS invention consists of a new and useful method of making vignette papers for photography, as hereinafter described. By my method the paper is printed by lithography, or other suitable means, on both sides; one side with red ink and the other side with yellow ink; the gradation of tint from the solid colour to its faintest edge being obtained by means of stipple, spottle chalk, or otherwise; or, instead of red and yellow inks, any other two suitable colours may be used; or the paper may be printed, as before named, on one side only in any non-actinic colour for the same purpose. After the printing is completed it must be thoroughly dried, and then the paper must be rendered transparent by varnishing one or both sides, or any other suitable means, and when the varnish becomes hardened the paper is ready for use; or, if preferred, the paper may be rendered transparent before being printed on.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—Producing vignette papers by printing by any suitable method non-actinic colour on to one side or on to both sides of paper already transparent, or to be rendered transparent in the required parts after printing as herein described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
June 14.....	Great Britain	5A, Pall Mall East.
" 14.....	Derby	Sykes's Restaurant, 33, Victoria-st.
" 14.....	Manchester Amateur	Masonic Hall, Cooper-st., Manestr.
" 14.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 15.....	Bristol and W. of Eng. Amateur	Queen's Hotel, Clifton.
" 15.....	Bury	
" 15.....	Hyde	Mechanics' Hall, Hyde.
" 15.....	Manchester Club	
" 15.....	Edinburgh Photo. Club	5, St. Andrew-square.
" 15.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 16.....	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, June 2nd, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. J. Taylor presided.

The CHAIRMAN remarked that the Cellerier Syndicate had invited the inspection of their process that day in relation to what they called photography in natural colours; he and Mr. T. Bolas were among the members of the press who consequently attended. The specimens exhibited were merely coloured photographs, and upon being told that the description of the photographs publicly made was misleading, they replied that if so it was unintentional on their part, and they would alter the title of the Company. He found that to see the working of the process he would have to leave London for Sideup, and that being inconvenient he had not gone there. He asked them in what their method differed from Ashton's process, and they replied that they could cement the pictures; he replied that that had been done before. They said, "Well, these are in carbon," and he replied, "So are the Woodburytypes."

Mr. A. L. HENDERSON said that the Antotype Company had once turned out carbon photographs backed by coloured *papier minéral*; they had much the appearance of old oil paintings. Léon Vidal had exhibited some beautiful photographs taken by one of this class of processes at the last International Exhibition in Paris.

The CHAIRMAN added that Vidal had applied the same principle to some beautifully executed portraits, and that a detailed account of his process had been published in *The Popular Science Review*. One difference between Mayall's and Cellerier's process was, that Mayall had not floated a company yet. Mayall had not sent him yet the photograph for which he sat; perhaps no colours could be found to suit his features.

Mr. L. MEDLAND read the following extract from *The Family Doctor*, No. V., Vol. I., April 4, 1885:—"Photographic Printing in Colours.—Paint by hand, with transparent colours, an ordinary negative. 1. Take a piece of

ordinary sensitised paper and wash it to remove any free silver nitrate. 2. Place the washed paper in a solution of protochloride of tin, and expose to weak light until the silver chloride is reduced to subchloride and the paper assumes a uniform grey colour. 3. Float the paper on a mixed solution of chromate of potash and sulphate of copper, and dry in the dark. The paper is now sensitive to all the colours of the spectrum, and by printing upon it with a coloured negative the colours of the negative will be reproduced. After printing, wash with cold water and dry."

The CHAIRMAN remarked that the statements just read were true; it was Becquerel's process, but scarcely explicitly enough stated. If it could be quickened sufficiently for the camera it would be one of the steps in the direction of photography in natural colours. The best thing done yet was by Carey Lea, who, with subchloride of silver, had certainly obtained colours.

Mr. J. B. B. WELLINGTON exhibited some of the red chloride of silver spoken of by Mr. Carey Lea. He said that it was sensitive to light, that it consisted of chloride and subchloride combined, and that it was not soluble in nitric acid, but would dissolve both in ammonia and hypo. He exhibited a piece of paper coated with it, with a print of Warnerke's sensitometer screen thereupon.

Mr. HENDERSON thought that the image had really been produced, as usual, in chloride present, and not in the subchloride.

The CHAIRMAN said that Becquerel, with red chloride of silver upon Daguerreotype plates, had obtained photographs in natural colours.

Mr. HENDERSON moved a resolution to the effect that that Association considered the title of Cellerier's process to be misleading, that the process was not novel, and that this should be notified to the public.

Mr. A. MACKIE seconded the motion, which was then passed.

A question in the box asked what was the action of the infinitesimal proportion of chloride of lime, one grain to a quart, recommended for toning prints.

Mr. HENDERSON thought that such a small proportion would have no effect at all.

Mr. YORK had been trying it, and could not find that any effect was produced.

Mr. HENDERSON supposed that a trace of chloride of lime might help to keep the whites clear.

The question was asked why citric acid tended to preserve sensitive albumenised paper.

Mr. W. H. HARRISON believed because most acids resisted deoxidising influences in photographic processes. Ferric salts had a tendency to be deoxidised directly by light and other influences. The haloid salts decomposing under light and other influences tended to deoxidise water, and the oxygen then attacked any organic matter present.

Mr. W. M. ASHMAN objected that ready sensitised paper printed as fast as other paper.

Mr. HARRISON thought that in any such cases the relative power of light was so strong that the resisting power of the acid was not noticed.

Mr. J. J. BRIGINSHAW found that steeping prints in a very weak solution of washing soda greatly facilitated toning.

Mr. MACKIE believed that there was gum in most of the ready sensitised papers. Mr. W. K. Burton had found gum and citric acid formed one of the best mixtures for preserving sensitive papers.

Mr. HENDERSON believed that anything of the nature of a varnish tended to have that effect. If a ready sensitised paper were prepared on the principles he had publicly laid down for his "argentic stain" some time ago, it would be likely to have excellent keeping qualities.

Mr. HERBERT STARNES had prepared some plates according to Mr. Henderson's published formula, and they went brown at the edges.

Mr. BRIGINSHAW had some which had been prepared with it, and had kept perfectly.

Mr. JAMES ERNEST BROWN, of Melbourne, upon being invited to speak, said that he had not been long in England, but so far had seen nothing above good Australian photographic work, except that in Melbourne no one was yet turning out burnt-in enamels or producing photo-lithographs; not much, also, was doing in carbon printing. The Australian opal pictures were mostly produced by the old silver wet process; he thought that in time carbon would be substituted. Melbourne was the largest city by far in Australia and the chief photographers in it were Messrs. Johnstone, O'Shanessy, & Co., Limited, and Monsieur Grouzelle. Photographic societies had been started there, but they had died out because of small quarrels and bickerings; he believed that there was now no photographic society in Victoria. Prices were higher in Melbourne than in London, but the high duty on photographic goods made higher prices necessary. *Cartes* in Melbourne were turned out from 7s. to nearly £1 per dozen, and cabinets at from 10s. 6d. to £1 per dozen; for larger pictures there were no standard prices. In Victoria people demanded paper pictures with a gelatinous or other glaze, which he thought to be very bad taste. About half the photographers in Melbourne stuck to the wet plate process. They had one manufacturer of dry plates, and his plates were excellent in quality.

The CHAIRMAN thought from the specimens exhibited to the meeting by Mr. Brown of his own work that Australians had nothing to learn from London in the way of artistic portraiture. Once he had received a very good specimen of a vitrified enamel from Australia, but had forgotten whether it came from a professional photographer.

Mr. ASHMAN then introduced Mr. C. Wood, of Stamford, Kent, to the meeting.

Messrs. Medland, Smith, and others, then exhibited photographs they had taken during the recent excursion of some members of the Association to Chiddingstone, Kent.

The HON. SECRETARY remarked that the train on the South Eastern Railway took three hours to get there.

Mr. MEDLAND could not understand why halation appeared in one of his plates.

Mr. HENDERSON responded that the tendency of the times was for plates to get more and more thinly coated with emulsion.

Mr. WELLINGTON exhibited platinum prints of views taken at Leatherhead.

Mr. STARNES exhibited the results of some experiments he had made as to the comparative permanency of prints. He had cut a piece off each print and

placed it for nine days in a closed bottle containing sulphuretted hydrogen gas and a wet sponge. The platinum prints yellowed, Fry's bromide prints stood pretty well, and the Eastman prints best of all. In all the bromide pictures he had so tested, and there were many prepared in different ways, the whites had kept clean. He fancied that the Eastman paper contained some platinum.

Mr. HARRISON thought that in the instance before them due care had not been taken to get all the iron salts out of the platinum paper by sufficient temperature or length of immersion in the hydrochloric acid bath.

The CHAIRMAN had found some paper for development printing, issued by Marion & Co., to be extraordinarily sensitive.

Mr. ASHMAN wished that Mr. Starnes would try the influence of sulphuretted hydrogen upon blue iron prints.

The CHAIRMAN said that there were hopes that special railway facilities from London would be given to attend the Convention in Glasgow early in July.

The HON. SECRETARY said that several invitations had been received from different towns, inviting the Convention to hold its meeting in them next year.

The meeting then broke up.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE monthly meeting of the above was held at the Technical Schools, Bridge-street, on May 26,—Mr. W. J. Harrison, F.G.S., in the chair. There was a good attendance.

The minutes of the last meeting having been duly read, Messrs. A. Atkins, Jarvis, and G. Barton, were nominated for election as members.

The report of the excursion to Lichfield was read by Mr. A. PUMPHREY. In it was mentioned that one hundred and seventy-seven pictures were obtained, amongst them being some of Eastman's stripping films and also Pumphrey's flexible films. A very enjoyable day was spent, there being plenty to be taken by the camera; in fact, a number of the members went over for a second time, not having secured all they wished on the previous visit.

A large number of prints were shown by Messrs. Harrison, Hendren, Harold Baker, B. Karlese, Dutton, Pettitt, Thomas Taylor, Thomason, and J. H. Pickard, some of the views and interiors of the cathedral being very fine.

Mr. W. OSBORN then read his paper on *Reminiscences of Photography*, giving his experiences as an amateur photographer for the last twenty-five years, having gone through most of the processes from the Daguerreotype and calotype up to the present dry plates. He described the same, and gave a most valuable and instructive lecture to his listeners, finishing with a biographical account of the old pioneers of photography in Birmingham, foremost of whom stood the Society's President, Dr. Hill Norris, the original inventor of the dry plate processes.

Mr. PUMPHREY read a paper *On a Multiplex Dark Slide for Card-Mounted Films* [this will appear in a future number].

Mr. Welford then exhibited a number of cameras and shutters, and other apparatus, lent to him by various firms, notably amongst which were a detective camera by Newton & Co., Liverpool, and Newman's automatic shutter. He also showed street views and crowds he had taken the same day with the detective camera, which were remarkably good.

The meeting terminated with the CHAIRMAN announcing the excursion on May 30 to Millers Dale, Derbyshire; also the paper for June 23, *Printing by Artificial Lights*, by Mr. F. Birkett.

DERBY PHOTOGRAPHIC SOCIETY.

THE members of this Society, to the number of twenty, paid a visit to Staunton Harold and Calke Abbey on Saturday last, by the kind permission of the Right Hon. the Earl Ferrers and Sir V. H. Crewe, Bart., under the leadership of Mr. J. W. Price. The journey was made by brake, starting from the General Post Office shortly after two p.m., the weather being all that could be desired. On arrival at Staunton Harold the party took negatives of all the most interesting spots about this beautiful estate, and then proceeded to the "Saracen's Arms," where they were met by Mr. Leadbetter and Mr. Chapman (the respected stewards of Earl Ferrers and Sir V. H. Crewe), who entertained them at a most sumptuous and excellent tea, to which the members did ample justice, and a hearty vote of thanks was accorded to these two gentlemen for their kindness in providing such an unexpected treat. After tea a large group was taken on a 15 x 12 plate by Mr. Roberts (one of the members), also by Mr. Price and Mr. Keene. The journey to Calke Abbey was then continued, where some more plates were exposed, and the party returned to Derby at about a quarter to ten, having thoroughly enjoyed a most successful excursion.

HALIFAX PHOTOGRAPHIC CLUB.

THE monthly meeting of the above Club was held in the Mechanics' Hall on the 26th ultimo,—Mr. B. Rowley in the chair.

Mr. W. CLEMENT WILLIAMS gave a lecture and demonstration on the carbon process. The great simplicity and beauty of the process received the full admiration of all present, and many decided to adopt it at once. The general impression had been that the carbon process was a difficult and tedious one, but, as demonstrated on this occasion, the expression of opinion pointed to the opposite conclusion.

A very hearty vote of thanks was passed to the Lecturer, and also to the Autotype Company for the very great treat they had afforded the Club in sending for exhibition a large number of beautiful carbon pictures; as the President aptly remarked, quite a fine-art gallery.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE eighth ordinary meeting of the current session was held in the Professional Hall, George-street, on June 1, at eight o'clock, the President occupying the chair.

Mr. George Stewart was elected as an ordinary member. Dr. THOMAS W. DRINKWATER read a paper on *Pyrogallic Acid and its Uses in Photography* [see page 359], which was highly appreciated, and was the subject of discussion.

Mr. J. M. TURNBULL said he preferred to keep pyro in solution for development, because it was more convenient. It doubtless oxidised a little, but with the addition of sulphite of soda and sulphurous acid, and when kept well stoppered, it remained perfectly good for a long time. He had seen excellent negatives developed with it, even after the solution was twelve months old.

Mr. JAMES JAMESON entirely agreed with Dr. Drinkwater in using dry pyro. A solution began to change from the moment it was made up, whereas when used dry it could be depended upon to produce precisely the same results in each case and at any interval of time.

Mr. A. A. INGLIS found the Ilford Company's formula work well in his practice.

Mr. JAMES CRIGHTON developed with two stock solutions. Dr. DRINKWATER replied to some remarks made in reference to the manufacture of pyro, and reiterated his preference for keeping it in a dry state. He recommended a means of measuring it for use contrived by Mr. Jameson some years ago, namely, a graduated glass tube in which a sliding pencil-shaped piece of wood is adjusted. The tube is simply dipped into the dry chemical and takes up exactly whatever quantity is desired.

The SECRETARY intimated that a strong desire had been expressed for one or more outdoor meetings on the Queen's Jubilee holiday, the 17th instant, and that Dunfermline, Dollar Glen, Roslin, and St. Andrews, were places which had been thought of as suitable to visit. Members desirous of using the holiday in the manner proposed should meet in the Council room on Tuesday evenings, the 7th and 14th instant, to make arrangements or otherwise signify their wish to join a party, the results of the day's work to be shown at the annual display in November.

Mr. TURNBULL then proceeded to give a description of the process by which stripping film negatives were obtained, and exhibited to the members a number of films, and his manner of detaching them from their paper and glass supports.

Mr. W. BASHFORD referred to the stripped eburneum films of twenty years ago, and how long a good idea sometimes had to wait before its merits were generally recognised and turned to practical account.

Mr. JAMES McGLASHAN remarked that care was needed in drying the film before removal, so as to secure the stage at which stripping was easy.

Mr. J. Wardale exhibited a new shutter release, which consisted in a small brass ball being propelled pneumatically in a short tube and caused to strike the trigger of the shutter, any shock being manifested after the exposure was made.

Grimstone's patent shutter for working between the lenses was exhibited by Mr. JAMESON, who spoke highly of its merits as a portable and ingenious piece of apparatus.

The ordinary meetings are suspended during July, August, and September.

Correspondence.

Correspondents should never write on both sides of the paper.

THE PHOTOGRAPHIC SOCIETY AND MEDALS.

To the EDITORS.

GENTLEMEN,—I have heard a rumour that the Council of the Photographic Society of Great Britain has under consideration the desirability of withdrawing the medals which have done so much to make the exhibition a success. Their decision is only postponed, I hear, that the feeling of the members of the Society may be obtained. How they intend to get the information I have no means of knowing, but, as a contribution to the subject, I have taken the trouble to make some inquiries, and send you a dozen of the replies I have received.

No. 1 writes:—"Quite a fatal mistake. Few of the leading photographers have anything to gain by exhibiting except honour. They will not care to go to the trouble and expense of preparing pictures for exhibition if they have nothing to hope for. There are already too many exhibitions to make anybody but the youngest amateurs eager to send to any particular one."

No. 2 says:—"You will have to send your Secretary into the highways and byways to fetch in the lame, the halt, and the blind, for the guests accustomed to honour won't appear."

No. 3. "We live in degenerate days. Emulation used to help a man to do his best. Perhaps, however, all really do their best, but don't want others to take the reward of doing better. Rank Socialism!"

No. 4. "Another robbery of the country members. The chance of the medals was all they had for their subscriptions, except the *Journal*, with three weeks' old news."

No. 5, who I expected would strongly object to the withdrawal, unexpectedly says:—"I don't care; it will suit me. It has been my modest ambition to have the largest collection of medals in the world, and I have got it. This, of course, will continue if others have no chance of levelling up."

No. 6. "Don't give up medals, but rule a certain number of regular medal takers out of competition, so as to give the second line a chance." This man belonged to what may be called the second line, and wanted

to get to the top of the tree by cutting away the upper branches, and making a fictitious summit. I suggested that the tree should be cut down to the stump to give that a chance, but he wouldn't see it. This correspondent also recommends that all the best pictures should be skid so as to give the general exhibits a chance. He also says something about removing the Queen, the Lords and the Commons, but politics are not to our purpose.

No. 7 airs his classics:—"Metiri se quemque suo modulo ac pede verum est. Some people know themselves, and can never hope to win a medal, and object to have this pointed out."

No. 8. "Medals ought to encourage photographers, but if they are given as at our late exhibition—two each to the Hon. Treasurer and Hon. Secretary for very inferior work, and, in two cases, without competition—I should vote for their abolition. It will take years of good management to restore confidence in our Society."

No. 9. "Medals have made me a better photographer than I should have been. I have not won many, but the effort to win has been of incalculable service."

No. 10. "There was a time when the honour of exhibiting was enough, but that is passed, and pictures done for the honour of the art will cease to be produced if not encouraged by the hope of medals or similar rewards showing the approbation of fellow photographers of good work. But not, however, with diplomas for medals, as at Edinburgh last year. That was too ingenious a method of substituting paper for gold and silver."

No. 11. "Suicide! Leave out a dozen or twenty of the pictures usually medalled, and your exhibition would be no more worth a visit than those in Bond-street. Who cares to go over a thousand ordinary photographs with nothing to break the monotony?"

No. 12. "The suppression of medals would save me a lot of useless expense. I should never exhibit."—I am, yours, &c.,

AN EXHIBITOR.

PHOTOGRAPHING LIGHTNING.

To the EDITORS.

GENTLEMEN,—May I beg to call your attention to the enclosed circular which the Council of the Royal Meteorological Society have just issued to all the Photographic Societies and Clubs of Great Britain, in case you should think it worthy of some notice in your editorial columns.

The Council believe that photography may settle several points connected with the discharge of lightning, about which physicists differ very much, and hope that they may be able to enlist workers in this field of research.

The Council have also inserted advertisements in the leading photographic journals, so as to leave no stone unturned in their endeavours to obtain the information they want.—I am, yours, &c.,

WILLIAM MARRIOTT, *Assistant Secretary.*

"The Council of the Royal Meteorological Society are desirous of obtaining Photographs of Flashes of Lightning, as they believe that a great deal of research on this subject can only be pursued by means of the Camera.

"The Council would esteem it a great favour if you, or the Institution which you represent, could give them any assistance in this matter, either—1. By sending them copies of any Photographs of Flashes of Lightning that may have been already taken; 2. By endeavouring to procure them yourself, or to interest others in the work.

"It may be well perhaps to mention that the Photography of Lightning does not present any particular difficulties. If a rapid plate and an ordinary rapid doublet with full aperture be left uncovered at night during a Thunderstorm for a short time, Flashes of Lightning will, after development, be found in some cases to have impressed themselves upon the plate. The only difficulty is the uncertainty whether any particular flash will happen to have been in the field of view.

"The Council hope that now the Thunderstorm season is approaching, many Photographers may be found willing to take up this interesting branch of their art."

PRESERVATION OF FERROUS SULPHATE.

To the EDITORS.

GENTLEMEN,—I notice in the current number of the *JOURNAL* a paper by Mr. Kenyon detailing an elaborate system for the preservation of ferrous sulphate solution. Is all this precaution necessary? I think not.

At one time, under the impression that a solution of this salt rapidly deteriorated, I adopted all manner of precautions, but found them troublesome, especially with rubber tubing and pinchcock, for I found my tubing became covered with crystals of ferrous sulphate however tight the cock appeared to pinch. I find no difficulty in getting the solution to keep almost any length of time provided it is well corked. I always use the granulated sulphate of the Pharmacopoeia and do not make up any large quantity at a time. A small one suffices, as I am in the habit of using my developing (mixed) solution over and over again. After using I bottle it up, add a minute quantity of citric acid, and expose to sunlight, after the manner recommended by Mr. Hepworth in his little book on phot-

graphy, and to me it appears an old solution works even better than a fresh one; I may be wrong, but this my impression.

I enclose for your inspection a print on Fry's paper developed with a solution mixed upwards of a fortnight ago. I developed another one on Eastman's paper with the same solution directly after, with equal results. —I am, yours, &c.,

J. G. BRADEN, M.R.C.S.

Castle-place, Lewes, June 6, 1887.

[The enclosed print is very brilliant, and the blacks are singularly beautiful.—Eds.]

NEW PATENTED INVENTIONS WHICH ARE NOT NEW: CAMERA BACKS.

To the EDITORS.

GENTLEMEN,—In the issue of the 27th May of THE BRITISH JOURNAL OF PHOTOGRAPHY, you insert a notice of a changing back patented by Mr. A. S. Newman.

In his description of it he says:—"For this purpose I construct the changing box, holding any suitable number of plates, with two slits or apertures at the top of the box, one at the back and the other at the front. Over these slits a hood or covering is mounted of sufficient size to freely contain a plate, this hood or covering being formed of any flexible light-tight material (or it may be a bellows), and is securely fixed on the box," &c.

He then goes on to show how the exposed plate is to be raised through the front slot, and transferred to the back of the other plates by passing it through the back slot, and he describes a cranked lever and other means for raising the plate in the first instance.

To-day's JOURNAL brings Mr. Procter on the scene as a claimant of the idea, and I see by his letter that he used a changing arrangement very similar in the spring of 1885, and I note your remark at the foot of his letter to the effect that ingenious photographers would do well to send an account of their inventions to the journals.

I was the ingenious photographer who invented the method of changing plates, and I did publish an account of my invention in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, with a diagram, which any one may see by referring to the 1885 ALMANAC, page 140, under the title, *A New Departure in Dark Slides*. The account of my invention was sent to you in November, 1884, but it was invented, and I can prove it, in both single and double forms two years previously.

Mr. Newman's patent refers to a single back, but in my contribution I described a double back. It was, however, perfectly plain that the arrangement applied to both single and double backs, and, indeed, it was applied in the single form (with a fixed bag) first, like the ordinary single wet plate slide, but thicker. Seeing, however, that there would be less changing required by the double method (as by it a dozen plates or films can be changed in only five operations, the plates being in pairs back to back), I described that method in the ALMANAC. There were only two kinds of slides existing, the single and the double, at the time I was writing, and my title, *A New Departure in Dark Slides*, included both.

A member of the Club and of the Photographic Society of Great Britain, Mr. J. A. Harrison, knew of my invention long before it was published.

As to the two methods of changing, single or double, there are advantages in each. I think the double the most convenient. The plates in metal carriers take up less room by being two in a carrier, back to back, with a piece of thin black card between them, whereas in the single arrangement each plate needs a carrier and partition, making a difference in weight and bulk.

Having published my invention in the ALMANAC, I claim precedence over both Mr. Newman and Mr. Procter, and without attributing *mala fides* to either of them, it is singular that their inventions should crop up so soon after publication of mine.—I am, yours, &c.,

G. V. J. POIRIN.

2, Eardley-villas, Eardley-road, Streatham, S.W., June 3, 1887.

PHOTO-MICROGRAPHIC APPARATUS.

To the EDITORS.

GENTLEMEN,—Replying to "Procella's" letter on this subject in your last issue, I may say that in taking up this most absorbingly interesting branch of photography the necessity of perfect registration between the focussing screen and the sensitive film was at once apparent. To obtain this I use a single dark slide, having a carrier into which a loose focussing screen is fitted. The screen, after focussing, is replaced by the sensitive plate, which, occupying exactly the same plane, ensures perfect register.

Photo-micrography is now beginning to receive that attention to which its usefulness and importance well entitles it, and I quite agree with your correspondent that matters of detail, although small in themselves, cannot be too widely ventilated for the benefit of those who make photo-micrography one of their studies.—I am, yours, &c.,

Walthamstow.

J. J. BRIGNSHAW.

To the EDITORS.

GENTLEMEN,—I should like, with your permission, to make a remark on one point raised in the letter of "Procella" in your last issue. He

finds fault with the metal slides advocated by Mr. Nelson for use in photo-micrography, on account of the want of mathematical coincidence between the position of the sensitive film and that of the focussing screen, upon the absolute necessity of which he lays the greatest stress. Having given considerable attention to this very point, I venture to disagree entirely with the conclusions of "Procella."

The conditions involved in photo-micrography are exactly the reverse of those existing in photography—the former deals with a picture produced by divergent rays, the latter with one produced by convergent rays; in fact, photo-micrography is exactly like enlarging, and every one who has worked at the latter knows that in enlarging to any great extent a difference of position such as would be fatal to success in direct photography becomes inappreciable.

I have no hesitation in saying that with a distance of four feet between the eye-piece and the screen, a variation in position of half an inch of the plate would scarcely be perceptible in the negative, except by alteration of size.

With reference to the use of the eye-piece, "Procella" overlooks the fact that the corrections of objectives are made with a view to their being used in combination with eye-pieces, so that many objectives will not do their best without them; personally, I find that the convenience in working afforded by their use far outweighs any theoretical objections such as those advanced by "Procella."—I am, yours, &c.,

363, Old Kent-road, S.E., June 6, 1887.

EDWARD C. BOUSFIELD.

To the EDITORS.

GENTLEMEN,—Since you published, more than two years ago, my method of making photo-micrographs, I have been making numerous experiments in order to improve the results. In "Procella's" letter in your edition of the 3rd instant, I notice that he has never used an eye-piece for photo-micrography. It is probably a matter of opinion whether the eye-piece should be used or not, excellent negatives being produced by both methods. For my own work, which is chiefly pathological, anatomical specimens, and bacteria, I invariably use the eye-piece; and though for experiment I have frequently taken the same object without eye-piece, I do not hesitate in saying that in my hands the negative taken with the eye-piece is far superior to the other. I may have been more fortunate than some in my choice of oculars and objectives, but I have only once had to discard an objective for non-correction of visual and chemical foci.

In case it might be of use, I subjoin a complete list of the lenses I use for microscope photography:—

Eye-pieces.—Zeiss' Nos. 1, 2, 3, and the new series, No. 18, 10 mm.

Objectives.—Wray's 3 in. Zeiss' a', A, DD., and one of the new glass apochromatics marked 16.0 mm., apert. 0.30. Leitz, homogeneous immersion $\frac{1}{2}$.

I have tried Zeiss' new projection eye-piece, but can find no advantage in using it. His apochromatic series are perfect, and give a great "depth of focus." I have experimented on isochromatic plates, and think they will be useful, especially for double stained bacteria, though not necessary when vesuvin is used as a stain.—I am, yours, &c.,

J. COCKBURN.

Greybrook, St. Boswells, N.B., June 5, 1887.

To the EDITORS.

GENTLEMEN,—Referring to "Procella's" letter in your last issue, may I say that my experience differs somewhat from that of your correspondent? Accurate focussing is undoubtedly essential, but its attainment depends much more upon the distance observed between the object and the lens than the distance between the lens and the focussing screen or the sensitive plate, upon which the image is projected in the same manner as upon the screen of an optical lantern, the object itself being but a few inches from the lens, while the image is projected to a distance of many feet, and a considerable latitude in the position of the screen, after focussing, is allowable both in the case of the lantern and in that of the photo-microscope.

"Procella" might "dare" to try the metal slides in the photo-micrographic camera and be a gainer by the experience, as I became after daring against advice to try microscopic lenses not specially corrected for photography, and warranted not to work "true to focus," but they worked true to focus nevertheless. If, however, "Procella" insists that the focussing screen and the sensitive plate shall register accurately, then the metal slides (which I assume to be those of Tylar's make) are admirably suited for the purpose, as they separate into two parts, either of which can be used as a frame for the focussing screen, which may be held in position by two small spring clips, and after focussing the object it is not only possible but easy "to remove the screen from the frame and substitute the sensitive plate for it." I have been familiar with the working of these slides for a year or more, and now use no other kind.—I am, yours, &c.,

JOHN EDMONDS, President of the Birmingham

Hockley, Birmingham.

Microscopists' and Naturalists' Union.

VALUATION OF GOOD-WILL.

To the EDITORS.

GENTLEMEN,—I note your suggestions on this matter. I should think these bargains are generally made as you would buy a horse, by a rough

estimate, but if a proper systematic valuation is to be made, I would advise that an experienced photographer be asked to report (1), Upon the character of the locality and the surrounding population; (2), The suitability of the premises to the business; (3), To value the apparatus, or movable plant, and which could be sold by auction when done with; (4), The number and quality of the negatives; (5), To give his opinion as to the probable yearly return to be got from (a) the business; (b), the stock of negatives.

Having by these statistics and evidence arrived at the probable annual profit for a given term, I would say, What is the present value of an income of £— for — years at 10 per cent., which is to cover redemption of capital?

As an amateur, I have no idea of the value of such profits, but in the case of mines, where the risk is great, it is usual to take fourteen per cent. to redeem capital and fair interest, in the length of time the lease or supply of minerals lasts.

To the above sum may be added the present value of the auction price to be realised by the plant at the end of the term, but this would be a very small sum. These present values may be either calculated or got from tables, and any present capital required beyond the mere price necessary to conduct the business should be deducted.

May I add a word on the proprietorship of the negative? When a dozen portraits of any size are ordered, the sitter is seldom, I believe, able to prove that there was a negative. By general knowledge he may be aware that he cannot be photographed without one, but he never sees it, unless by special goodwill of the operator, and if he gets his dozen cabinets that is all he asked for, and all that was promised him, or that he can prove is in existence.—I am, yours, &c.,

A. L. STEAVENSON.

Durham, June 6, 1887.

COAL GAS AND FUMING PRINTING PAPER.

To the EDITORS.

GENTLEMEN,—Let me supplement your remarks on the use of coal gas. You mention that there are three dials visible. There is, however, another above these which is useful, not only to indicate leakage but also to measure the quantity of gas consumed per hour by any burner. On the smaller meters, such as are usually found in moderate sized houses, the hand moves once round for each foot that passes through (or for each two or three feet in larger meters as marked on the dial). It is thus easy by watching it for only ten minutes or so (each foot being divided into quarters) to calculate how much gas is being consumed per hour. I have tested all my stoves and burners in this way.

There is another matter to which you have scarcely alluded. This is the great excess of pressure, beyond what is desirable for economical consumption, which is generally given by the companies. For most purposes a pressure of less than one inch of water is ample, but three or four inches is nothing unusual, and in such a case the waste of gas is considerable. It may be remedied in two ways, either by small regulators on each burner, or one large one on the main just outside the meter. I use the latter, but as it is occasionally useful to have the full pressure for furnace work and other purposes, there is a bye-pass with tap, which allows the gas to pass, when required, without going through the regulator. N.B.—There are many so-called regulating burners which are humbugs.

In the same number your correspondent, W. K. Burton, mentions that the Americans dry their albumenised paper after silvering over a row of Bunsen burners without any ill effect. I can confirm this. It has been my practice for many years when only a few sheets are required. If there are many to do, I prefer drying over hot water pipes, but it would be too much time and trouble to heat the furnace (it is a gas furnace for the sake of cleanliness and simplicity) for only a dozen sheets or so. On only one occasion have I met with an accident, when the whole batch was sulphurated. [Editor—Query sulphurised.] I complained at the works, and they admitted that there was something out of order on that day.

Mr. Burton also remarks on the universal practice in America of fuming the paper. I have tried this over and over again as it has periodically cropped up in the journals, and my verdict is that it is an advantage with some samples of paper. I have had a ream now and then that would not work satisfactorily without fuming, and was all right with it, but with the paper I am in the habit of using, which is prepared to my special order, with from eight to twelve grains chloride of ammonium to the ounce—a much larger quantity I think than is used for commercial papers—fuming is no advantage whatever. The prints certainly look richer on taking them out of the frames, but there is no difference in the finished result.

My experience is entirely with Saxe paper and landscape work. It is possible that with other paper and for portraits there may be a difference.—I am, yours, &c.,

RUSSELL SEDGFIELD.

Norbiton, June 5, 1887.

DEVELOPMENT OF GELATINE PLATES WITH HOT WATER.

To the EDITORS.

GENTLEMEN,—In the paper on *Odds-and-ends*, by Mr. Heywood, in your last JOURNAL, he asks the question, "How a plate would be affected in development by hot water?"

I have during the winter used hot water for developing, and found it excellent both for ordinary negatives and transparencies on lantern plates. I consider I get a better tone (warmer) by the hot water.

I think if Mr. Heywood had used hot water in the development of the plates exposed in Norway they would not have frilled. In my experience hot water prevents frilling, and makes development much quicker. In instantaneous work it would be a great advantage, as the plate would develop sooner, and there would be less danger of fogging.—I am, yours, &c.,

EDWARD WOODWARD.

Upton, Macclesfield, June 4, 1887.

THE RIGHT TO THE NEGATIVE.

To the EDITORS.

GENTLEMEN,—I am a lady amateur. I have had my portrait taken many times by professional photographers, but about the negative retained by them I gave no heed—indeed, the subject never entered my mind.

The correspondence, however, on this subject which has appeared in your columns has forced upon me the serious importance of the question, and I now ask myself, What right have photographers to retain the negatives of persons whom they have photographed, and for which they have been handsomely paid?

Criminals in our jails are photographed and the negatives of them are kept, registered, labelled, and stored. Have ladies and gentlemen to be subjected to such criminal bondage, even against their will, by men whom they have employed and whom they have paid well for their work, by men of whom they know nothing further than their professional name? Have ladies and gentlemen, I again ask, to be subjected to such criminal treatment? to have their portrait negatives retained, registered, labelled, and stored for the profit of any man? Have ladies and gentlemen, to be freed from this criminal bondage, to pay blackmail?

I blush to think that any photographer who values his manhood would dare to uphold so monstrous a system.

This question is of sufficient importance for the daily press, and a good subject for our young men's debating societies.

The letters in your columns from the upholders of this wicked system are suicidal, and furnish the best possible evidence against it, and are levers for its correction.—I am, yours, &c.,

MILLIE.

Newcastle-upon-Tyne, June 4, 1887.

To the EDITORS.

GENTLEMEN,—Allow me to point out to "J. F., Newcastle-on-Tyne," that one man charges, and gets, for his first dozen of *cartes four* and sixpence, while another, presumably more gifted, charges, and gets, a guinea for his first dozen of same size photographs; so is it the negative image or the artistic and other abilities of the photographer that makes the difference in price?

Further, cannot able photographers, like other able artists or doctors, make their own terms with the public without being stigmatised as "J. F., Newcastle-on-Tyne" has done in the second paragraph of his extraordinary letter?

"J. F." might cogitate to some advantage over the "pound of flesh" T. Coan dangles before Mr. J. Dutton!—I am, yours, &c.,

Edinburgh.

USE AND WANT.

To the EDITORS.

GENTLEMEN,—Mr. T. Coan, in his letter which appeared in your JOURNAL of the 3rd instant, asked me, in reference to the proprietaryship of the impression on the film of the negative, "Supposing he or she desires to exercise the right to take away the said impression, how is it to be done?" Well, to use a vulgar expression in answer to a stupid question, "It cannot be dill." But I said nothing about the right of the sitter to take it away; on the contrary, I said that custom had given the photographer the right to keep it.

Mr. T. Coan appears to think there can be no proprietaryship in anything that cannot be handled; in this, however, he is much mistaken. For example, the holder of the copyright of a book may put the MS. in his pocket, with a legal deed that secures the copyright to him; but the most valuable part of the property consists in the exclusive right of its production and sale—this he cannot put into his pocket. And again, when the book is set up in type to be printed it does not become the property of the printer, although the type used is his own; it still remains the property of the original owner, who, on the other hand, has no right to the type or the setting up without purchasing it. The analogy between this and the photographic negative is obvious and needs no comment.

Mr. Coan also mentions the "greedy photographer." Is it not rather the greedy amateur, who, not having the skill to make good portraits of his friends, wants the photographer to give up the negatives to enable him to print from them.

Perhaps, however, I should not take his letter seriously, as on reading it again I am inclined to think he only meant to make what Artemus Ward calls a "goak."—I am, yours, &c.,

J. DUTTON.

Bath, June 6, 1887.

To the EDITORS.

GENTLEMEN,—It is very interesting to your readers to know that your correspondent, "J. F.," of Newcastle-on-Tyne, considers that successful extortion cannot be eminently satisfactory to the profession. Why, however, does he draw the line at successful extortion? What has success or failure to do with it? "J. F." has left out of his letter what must certainly have been in his mind, namely, the familiar words, "God, I thank Thee that I am not as other men are, extortioners, unjust," &c. Leaving this, however, and returning to "use and wont," which I think must govern the question, I would remark that I am not a professional photographer, but remember more than twenty years ago buying of a professional photographer his negatives of a near relative of mine then lately deceased, and considered then, as I do still, that the transaction was a fair one, and that I was not the victim of "successful extortion."—I am, yours, &c.,
W. H. J.

To the EDITORS.

GENTLEMEN,—Having perused with considerable interest the correspondence in your valuable JOURNAL on the above subject, may I be allowed to solicit your opinion upon a question very much akin to what has been already treated in your columns? The circumstances of my case are as follows: I took a likeness of a certain person prominently connected with a popular movement, and presented it gratuitously to the party. Shortly afterwards, to my great astonishment, I saw a reprint of this identical photograph on the front page of a periodical issued by the fraternity, without my permission nor acknowledgment of authorship. Now, I am desirous to ascertain whether I have any power to make a claim for this glaring infringement of a right and pecuniary loss thus incurred, which should have been reserved by me and for me, or should at least be duly acknowledged as a copy from my production.—I am, yours, &c.,
Carnarvon, June 1, 1887.

JOSEPH KINSLEY.

Exchange Column.

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

Handsme black Newfoundland dog, will exchange for whole-plate wide-angle rectilinear lens by good maker.—Address, J. H. GOEMAN, Dulverton.

Wanted, a wide-angle doublet lens, half-plate, in exchange for short-foeus rapid C.D.-V. portrait lens by Shepherd.—Address, Mr. E. B. HODGSON, St. Paul's Vicarage, Halliwell, Bolton.

Wanted, in exchange for five backgrounds in good condition, a half-plate view camera with three double slides. Photographs sent. Or exchange in backgrounds.—Address, T. S. DAVIS, 4, Silver-street, Halifax.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED:—

George Watmough Webster, 5, Eversley-park, Liverpool-road, Chester.—Eight views of Eaton Hall.

SIMMONDS.—Apply to Mr. Gotz, 19, Buckingham-street, Strand.

J. E. HOLMES.—Messrs. Marion & Co. supply the brass rims for mounting photographs; so does Mr. J. Fallowfield.

POSING.—There is no work published on the subject. Your best plan will be to study the best work by our leading photographers.

ALONZO.—Brown-hard varnish is preferable to white-hard as a protective of negatives. The quantity of spirit added in either case is about the same.

Z. A.—For rapidity of action nothing surpasses the portrait combination; but, in proportion to its focal length, its covering powers are somewhat circumscribed as compared with other forms of lenses.

F. FREEMAN.—There is no photographic directory published. Kelly's *Chemists' and Druggists' Directory* contains the names of most professional photographers. This is the nearest approach to a directory of photographers.

LEX.—So many roll holders and analogous contrivances have from time to time since the earliest days of photography been described. If you refer to the annual lists of patents published in the ALMANACS from year to year you will find what has been patented.

W. A. C.—The markings on the plates are due to the manufacture and not to the development. The markings are known by many as "snail marks," and there is no method of getting rid of them when they exist. Sometimes, however, they do not show so strongly in the finished negative as their appearance on the plate would lead one to imagine.

D. MCGREGOR.—There are several methods of making opal enlargements. The simplest method is to make them direct on gelatino-bromide plates, such as are supplied commercially for the purpose. The makers supply a formula for the development. Opal enlargements are also made by the carbon process and by the powder process; sometimes, though rarely now, they are made on wet collodion.

E. D. writes: "The other day after I had toned and fixed a lot of prints I put them in a large bath to soak for the night; in the morning, on looking at them, I found that nearly all of them had blistered more or less. As this is my first experience of blistering, I am writing to ask you to be good enough to tell me the cause and remedy."—From what our correspondent says, we imagine that the blisters were not apparent overnight. If they were not they must have been caused by the long soaking. Usually blisters make their appearance either in the fixing bath or in the first washing waters. The remedy in our correspondent's case would be to effect the washing in a shorter period.

J. K. B. says: "I should be glad if you will answer me the following queries in respect to the working of a burnisher:—1. Ought the prints, after mounting, to be perfectly dry before passing through the burnisher?—2. If they must be dry, is it necessary to put any soap or other lubricant on the faces of the prints?—3. Ought the pressure to be heavy—say as heavy as when using an ordinary rolling press?—4. To about what temperature ought the tool to be heated?—5. How many times ought the print to be passed through the burnisher?"—In reply: 1. The prints should be perfectly dry before burnishing.—2. The prints should be lubricated.—3. About the same.—4. The "tool" should be made tolerably hot, but not sufficiently so to scorch the prints.—5. Until the requisite polish is obtained. This will depend to some extent upon the pressure applied.

H. W. PHILLIPS writes: "1. Will you kindly give me, in your 'Answers to Correspondents,' a formula for making and method of using the boracic acid toning bath?—2. And can you relieve me of a difficulty I have with my negative varnish? I have made some with methylated spirit and white-hard spirit varnish, but no matter how much I dry the negatives after varnishing they are always tacky. If you can give me a remedy for this I shall feel deeply obliged."—1. By "the boracic acid toning bath" we presume our correspondent means the borax toning bath; if so, the proportions are from half a drachm to forty grains of borax to each grain of gold in about eight ounces of water.—2. Evidently an unsuitable sample of white-hard varnish has been used. If the white-hard varnish were of the ordinary kind no difficulty would be experienced, and it would dry perfectly hard on the negatives. Our correspondent should get a sample from another source and try again.

A. S. asks: "1. Will you kindly tell me what objection, if any, there is to using paper negatives for portrait work? Would there be distortion?—2. Also if you will answer the following:—I have commenced saving wastes; I mix everything together—fixings, paper, and gold baths when they go bad. I use salt, but the water is still very black, caused principally by the discolouration by fixing plates in the hypo. Will chloride of zinc do to throw down the metals?"—In reply: 1. There will be very little distortion provided the paper negatives are not attached to a ridged surface whilst they are wet. The Eastman Company are now supplying a paper for negatives in which this trouble is reduced to a minimum.—2. If all the baths have been mixed together either salt or chloride of zinc is useless as a precipitant; sulphide of potassium (liver of sulphur) must be employed. It is better to keep the different wastes separate and treat them separately—precipitating the gold from the toning baths with sulphate of iron, the silver from the washing waters with salt, and that from the fixing baths with sulphide of potassium.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—On Saturday, June 11, there will be an excursion to Chislehurst. The train leaves Cannon-street at twenty-five minutes past two p.m.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, June 15, 1887, will be on *Backgrounds*. Saturday outing at Gravesend. Train from Fenchurch-street at eight minutes past two.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The last ordinary meeting of the present session of this Society will be held on Tuesday next, June 14, at eight p.m., at the Gallery, 5A, Pall Mall East, when a paper on *Photomicrography and its Value in Biological Research* will be read by Mr. Edgar W. Crookshank.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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PERCENTAGE SOLUTIONS AND WEIGHTS AND MEASURES.

LAST week we promised to make a few observations on the subject of the mixing of percentage solutions, a topic with which questions of weights and measures are inextricably interwoven. Our attention was drawn to the subject by a number of letters in our contemporary, the *English Mechanic*, in reply to a querist who asked the meaning of the expression a "ten per cent. solution;" he had been told to take a "ten per cent. solution of chrome alum," and he asked, "Does this mean 10 ounces alum in 100 ounces of water, or 10 drachms in 100 drachms, or 10 grains in 100 grains?" The same question, in other forms, is doubtlessly being constantly put by other experimenters; repeatedly have we ourselves been called upon for an explanation. As we stated last week this querist was replied to by no fewer than six correspondents, which number included the names of at least one well-known authority, yet with one exception all made such erroneous statements in their replies as will form an excellent text whereon to expound this most simple, yet evidently confusing matter.

The first reply is vague; the second says, "A ten per cent. solution is one to ten." Wrong. The third is also vague at the outset and soon gets hopelessly wrong and at sea—"10 grains alum in 1 ounce water means 10 grains in 480!" The fourth is all wrong; he says, "If you take 10 parts water to 1 part chromic alum by weight," &c. He fails to comprehend the point. Number five says, "There is nothing vague about a ten per cent. solution of chrome alum. It means 10 parts of alum in 100 parts of water." This is evidently wrong, though the latter part of the letter shows a glimmering of the truth. Finally, the last letter states that in "photographic formulæ apothecaries' weight is always implied unless otherwise specified," a statement which is clearly erroneous, while still more glaringly so is it to say, as the writer does, that 10 drachms in 100 drachms is the same as 10 ounces in 100 ounces.

In trying to arrive at order out of this chaos of explanation, evidently typical of the state of mind of a large number of people, let us first explain what a ten per cent. solution does mean. It cannot be termed a strictly scientific expression; but by common usage it means, when applied to a solid dissolved in a liquid, a solution containing one-tenth of its weight of the particular solid. When applied to a mixture of two liquids it is usually understood to mean a liquid which contains a tenth of its volume of the specified liquid.

Thus a quarter of an ounce of a ten per cent. solution of chrome alum would mean a liquid which contained the tenth part of one hundred and nine and three-eighths grains of chrome alum. A pint of a ten per cent. solution of alcohol in water

would mean a solution containing two "fluid ounces" of alcohol.

Now the confusion of terms makes its appearance at this stage. Photographic formulæ, except for a few nice calculations, such, for example, as those needed in emulsion making and a few other directions, do not call for very exact measurements, as is instanced by the only recently forsaken "drop and pinch" formulæ for development; hence a somewhat slipshod mode of description is liable to be adopted. In practice no great harm perhaps is done, but the moment that exactitude of terms is asked for it is seen by our quotations how difficult it is to obtain it.

We have no purpose at this stage to enter into a discussion of the large question of the advantages and disadvantages of decimal *versus* other systems of weights and measures; we must take the British system as we find it, and endeavour to explain its apparent anomalies, though, once understood, they are simple and easy of application.

The unit of our system is the grain; upon it all other dimensions are founded. Thus there are four hundred and thirty-seven and a half of these grains to make the ounce of commerce, which only have photographers anything to do with. The troy ounce containing four hundred and eighty grains only refers to the precious metals and precious stones. Nitrate of silver is sold by the commercial (technically called *avoirdupois*) ounce. From this ounce we get the pound weight, which is equal to sixteen ounces. Confusion begins to grow interestingly intricate here. Every one knows there is a troy pound and an *avoirdupois* pound, each having its own number of ounces, also varying in weight as described; but if the grains figures only were remembered no difficulty need arise. The troy pound has five thousand seven hundred and sixty grains, the *avoirdupois* pound seven thousand grains—all grains it is understood being alike, whatever denomination they are connected with.

Perhaps if this were the only difficulty the true figures would soon be committed to memory, but, unfortunately, the capacity-measures tend in the opposite direction. The imperial gallon is a measure of a space which, when completely filled with water, would hold exactly ten pounds weight, or one hundred and sixty ounces. The one hundred and sixtieth part of a gallon, therefore, is a "fluid ounce;" but as a fluid ounce of water is equal to a weighed ounce, the first half of the word is usually dropped, a course which often leads to misconception when fluids heavier or lighter than water are in question. But the most unfortunate confusion of all consists in the divisions of the ounce. We have recalled the respective weights of the troy and the *avoirdupois* ounce, and here it may be mentioned that the ounce formerly used by apothecaries and by the chemist

and druggist, contained the same number of grains as the troy ounce—four hundred and eighty; hence, whenever the division of the fluid ounce into four hundred and eighty minims was called to mind, the majority of those referring to these divisions jumped to the conclusion that the minim and the grain were identical. This, however, it will be plainly seen they are not, for a minim of water is the four hundred and eightieth part of an ounce containing, not four hundred and eighty grains, but four hundred and thirty-seven and a half grains. Our readers who are not quite familiar with this point would do well to think it well over; they are not likely to forget it again. An ounce weight and an ounce measure of water (at suitable temperature and atmospheric pressure) are identical, and either contains four hundred and eighty minims or four hundred and thirty-seven and a half grains of water.

Let us in conclusion go back to the percentage question. If an ounce of chrome alum be dissolved in a small quantity of water, and, next, the solution made up in bulk to measure half a pint, that is, ten "fluid ounces," then every fluid ounce will contain a tenth of an ounce weight of chrome alum, but a fluid drachm will not contain a tenth of a drachm of alum; for if the latter term be employed at all (it was omitted over twenty years ago in the British Pharmacopœia) it means the eighth part of the apothecaries' ounce of four hundred and eighty grains. But this term should be entirely discarded and thus one form of confusion be avoided. We cannot but think the retention in our legal weights and measures of terms of similar name but different signification most unfortunate. It is the true cause of all this confusion.

PHOTOGRAPHING FLOWERS.

THERE remains little to be said beyond what has already appeared in previous articles on the general behaviour of orthochromatic plates in connection with their employment for flower subjects. Naturally with a class of objects exhibiting colour effects and combinations of the utmost variety and brilliance, these plates might be expected to prove themselves of the greatest utility, but it must be confessed that the actual results obtained are at first somewhat disappointing. We say at first, because though working in the ordinary manner, that is, without the coloured screen, we fail to secure those startling effects of colour reversal claimed by many; still, on more careful examination of the comparative results produced upon orthochromatic and ordinary plates respectively, there is a distinct advantage on the side of the former, more especially with flowers of the particular colours affected by the orthochromatic treatment.

A very large proportion of the more ordinary and popular flowers are of these particular colours, purple, blue, yellow, and orange, in their various shades and combinations, and mingled with white and green; blossoms of these colours are not only better rendered photographically, but there is also, even without the coloured screen, a nearer approach to the accurate expression of their colour values to the eye. But the large variety of colours comprised under the various shades of red, scarlet, crimson, pink, &c., are, if anything, sufferers from the employment of orthochromatic plates, for while the sensitiveness of the film has been left intact, or perhaps even lowered for those colours and for white, the yellows and greens have had their active value considerably increased. Thus flowers of red tints are found to suffer, especially the lighter ones, in comparison with blue and yellow blossoms if such be in juxtaposition;

but what is of greater importance, they suffer in a still greater degree in the comparison with their own foliage, which is rendered proportionately much lighter. To take a familiar example, we will instance a bright scarlet geranium, which will be found to be rendered many shades darker in comparison with its foliage when taken upon an orthochromatic plate than when an ordinary gelatino-bromide or a wet plate is employed.

Many of the exquisitely varied blooms of show pelargoniums form extremely difficult subjects to render photographically, owing to the strong colour contrasts of their markings as distinguished from the contrast to the eye. Take, for instance, any of those species combining white and delicate pink with markings of deep carmine merging into dark velvety claret or maroon. To the eye the lighter tints are perfectly distinct in spite of their delicacy, as are also the darker ones from the sheer contrast of their colour brilliancy; but in the camera the first are rendered as almost unbroken white, the others a uniform black, or the closest approach to it, and the general result is a most unsatisfactory contrast between nearly pure black and white. With ordinary plates, especially with wet collodion, much may be done by modifying exposure and development to remedy this state of affairs, but when orthochromatic films are employed such treatment serves but to emphasise the peculiar effects resulting from the plates themselves.

But as has been said, orthochromatic plates have unmistakably some advantages if their use be judiciously applied. For instance, if we take simple yellow flowers such as the ranunculus, dandelion, daffodil, narcissus, marigold, or sunflower, the mere heightening of the sensitiveness to yellow brings about a better rendering of the subject independently of any "orthochromatic" effect, simply because the blossom—as well as the foliage—receives a better exposure. We had a striking example of this a few days ago in photographing a laburnum tree in full blossom. The result upon an ordinary plate was such that no one inspecting the picture would have imagined the tree was in flower, foliage and bloom being of one uniform depth of tint. Upon trying an orthochromatic plate, however, the blossom was readily distinguishable without giving any effect of "snowiness" to the tree. When we turn to flowers in which yellow is contrasted with white, blue, or purple, the effects are still more marked, and here the advantage is reaped of whatever orthochromatic effect is to be secured without the coloured screen. Take, as an example, the common field daisy, with its pure white or crimson tipped petals and yellow centre. Few would recognise it from its photograph on an ordinary plate, its dark centre giving it more the aspect of a dwarf sunflower. But the power of the orthochromatic plate suffices to soften the contrast, and, by bringing up the yellow, to give a more natural aspect to the rendering.

But it is of course when yellow is contrasted with blue or purple that the most marked difference accrues from the use of the colour prepared films, though even then it is only in cases of very violent chromatic contrast that a specially palpable distinction is apparent, such as would be recognised at a casual glance, and such as would be produced with the aid of the yellow screen. The pale blue of the forget-me-not contrasted with its delicate yellow "eye," forms an instance in which it is difficult to distinguish the results of ordinary and orthochromatic plates; but if we turn to the large class of pansies, in which rich golden yellows enter into combination with deep velvety purples, almost reaching black, we find that the stained plates give a decidedly more favourable rendering.

Blue, in conjunction with white, forms another combination in dealing with which orthochromatic plates prove useful, and no more striking example could be selected than the pretty convolvulus of the old fashioned garden.

Of flowers of these descriptions and colours there are a very large number of favourites both in the garden and the hot-house, and though we have confined ourselves to the more popular ones in our remarks, still the amateur who has the contents of a conservatory at his disposal as subjects for the camera will find innumerable instances where orthochromatic plates employed without the screen will help him, if they do not give the full degree of success he would desire. If the coloured screen with its disadvantages be adopted the results may in cases be better, but on the whole we do not consider the "game worth the candle."

Occasionally combinations including red tints are found to be benefited by using orthochromatic plates. For instance, we recently met with a flower of the marguerite class, having crimson or carmine petals and golden yellow centre. With ordinary plates the colours were rendered of perfectly uniform tint, but upon applying an orthochromatic plate the difference was very distinct, the centre being considerably the lighter. Whether it was the heightening of the sensitiveness to yellow, or the lowering of the red, that produced the result we cannot say, but most probably the latter. Another example shown to us by a friend last year consisted of a group of *Rhodanthe maculata* in which deep rose, yellow, and crimson, enter into combination. The orthochromatic rendering was decidedly the better of the two, the colours being more clearly defined, and this in spite of the fact that the rose and crimson are in juxtaposition.

Sufficient has been said to show to those who wish to make flower photography a hobby, that while we would recommend them to use orthochromatic plates for some subjects, we should not advise them to rely upon them in all instances, nor do we desire them to expect too much from such use. If the operator employ them judiciously and rest content with what assistance they are capable of rendering, he will not in the long run have cause to complain.

In a note to the *Photographische Mittheilungen*, E. Vogel, jun., states as the result of experiments made by him that he finds when isochromatic plates have been prepared by immersing ordinary plates in a bath of azalin they lose their sensitiveness to some extent, but by subsequently immersing them in a two per cent. solution of ammonia their sensitiveness is quite restored.

When in Manchester the other day, we learned that Mr. John Eastham, who was one of the early pioneers in photography in Manchester, is suffering from the distressing malady which goes by the name of aphasia. This most melancholy condition is characterised by an inability to employ suitable words for the expression of thought, so that though the faculty of speech remains, it fails to communicate the ideas of the affected person. The attack is often sudden, and frequently arises from embolism of the cerebral vessels. As Mr. Eastham is in very reduced circumstances, it is to be hoped that friends who knew him in his better days may be found willing to interest themselves on his behalf. Mr. Eastham is now living in Bradshaw-street, Higher Broughton.

The long continued action of moisture is generally looked upon as being most destructive to photographs. That it does have a deteriorating influence, under certain conditions, no one will deny. Under some circumstances, however, it would appear to be inert, if we may judge from some examples shown by Mr. Fred. Hollyer at the meeting of the Photographic Club last week. Those pictures

—silver prints—had been kept damp for no less than five years, and appeared none the worse for the transaction. We learn that the prints were placed in blotting-paper to dry, but the parcel got mislaid, and was not found till quite recently—five years afterwards. It was then discovered in a damp portion of a dark room under a pile of other things, which had not been disturbed for years. When found the blotting-paper was moist, covered with mould, and smelt offensively. It could not be handled for rottenness. The prints were also mouldy on the backs, but the image was uninjured. After drying, and the mould being wiped off, the prints seemed none the worse for being retained under such adverse conditions, except that the back of the paper was permanently stained by the mould. Mr. Hollyer drew the particular attention of the members to the fact that, during the time the prints were in the blotting book, they were protected from the action of the atmosphere. This, he considered, had a far more pernicious action on photographs than moisture pure and simple.

MANY professional photographers, both in London and in the provinces, are complaining loudly of the unfounded reports which have appeared in the non-scientific press, to the effect that a process of photographing in colours has been discovered is causing them considerable annoyance in their businesses. Clients, they say, refuse to believe that the report is incorrect because so much prominence has been given to it by some of the daily papers, and they refrain from having their portraits taken for the present unless they can be done by the newly discovered process. One would almost have imagined that the discovery of a method of taking photographs in natural colours had been heralded so often that, like the "cry of wolf," it would have no importance attached to it. Such does not appear to be the case. Perhaps, however, the association of a well-known photographer's name with it has had something to do with the credulity on the present occasion; usually it is some obscure foreign scientist who has made the "important discovery." Mr. Mayall has made no claim to "photography in natural colours," though it has been made for him by certain London papers, and reiterated in many provincial ones. In most instances the report remains uncorrected.

THE inconsistencies of some of the newspapers on the subject of the so-called colour photography have been most amusing. For example, the *Daily Telegraph*, a short time back, in a leading article on Mr. Mayall's (?) discovery, after speculating as to what will be the attitude of such men as Sir Frederick Leighton, Sir James Linton, Mr. James Whistler, and the societies they preside over, and making some remarks anent fast and fugitive pigments, adds, "If the naturally coloured portraits of which the perfected execution has been proclaimed will really 'wash'—that is to say, if their permanency can be proved by time—it is clear that ere long little short of a revolution must be expected, not only in portrait painting but in many other important branches of art." A few days later, when commenting on the Cellerier Syndicate's productions, our contemporary says: "It is needless in these days, when a scientific primer can be bought for one shilling, to point out the boastful absurdity and inherent nonsense of any pretensions to photograph colours directly. To do so would be to attempt to rival the exploits of those wise old gentlemen of Laputa whom Lemuel Gulliver discovered engaged in the process of extracting sunbeams from cucumbers." It is to be regretted that the editor did not invest a shilling before writing the first article, as it would, to an extent, have prevented the public from being misled, and saved many photographers some little annoyance. However, there is an amusing side to the question, and this the latter have enjoyed.

THE taste for matt surface pictures is undoubtedly on the increase and will doubtless continue so, particularly if photographers give it encouragement. Most of the matt surface prints now produced are either by the platinotype or the gelatine process. One seldom nowadays meets with a print on what used to be known as "salted paper," and we question if many modern printers would know how to produce one. Whenever a matt surface print is now required, the usual practice is to sensitise a piece of ordinary albumenised paper on the back and to print on that. This is a clumsy expedient, and the

result obtained is far from satisfactory, as the image always has a flat and sunken-in appearance, very different from the plain prints of former times. Moreover, the picture is on the web side of the paper, which always gives it an unpleasant appearance. Plain salted paper used to be an article of commerce, and was kept by every stock dealer, but now we question if it can be obtained ready prepared. Perhaps plain salted paper would meet with a sale if it were forthcoming.

A CORRESPONDENT writes that M. Lambert, when over here some years ago demonstrating his processes, showed some, if not all, of his licensees a method of colouring carbon prints from the back similar to that recently described as a patented process. We believe he did, but the same thing was done by others long prior to the introduction of the Lambertype processes, and analogous methods of finishing carbon prints have been introduced since.

THE MANCHESTER EXHIBITION.

I.

TRUE to their instincts, the Manchester men seem to have got up their Jubilee Exhibition on a scale worthy of themselves and their great city. They appear to have been pervaded by a spirit similar to that by which they were actuated in 1857, when their smoky city was elevated into the position of being the most spoken-of place in the world. For it was then that Cottonopolis had reared an art palace and had gathered within its walls the art treasures of Europe. Where else could be seen under one roof, as we saw it in the June of the year mentioned, twenty-eight pieces of Raphael, thirty-five Murillo's, thirty Titian's, with an even greater plethora of the works of Rubens, Vandyck, Rembrandt, Teniers, Tintoretto, Leonardo de Vinci, Michael Angelo, and numerous other masters of the foreign school? When added to these were the innumerable home artists of former and contemporary times, including Reynolds, Hogarth, Gainsborough, Romney, Opie, West, Wilkie, Etty, Landseer, Leslie, Maclise, Faed, Gordon, Danby, and hosts of others who were represented by those works which are so familiar in the history of art, one is inclined to wonder not only at the boldness of the conception by which "cotton spinners and weavers" should aspire to making a collection such as was never before achieved, but at the astonishing success by which their efforts were crowned.

The spirit which animated these merchant princes thirty years ago evidently pervaded their successors, who have gathered together in nearly the same place and under more than one roof, large though they be, treasures of another class, yet which transcend in their influences on mankind that of the former period. Manchester is, and has good cause to be, proud of its Jubilee Exhibition.

But we started with an intention to speak of the Photographic Section of this singularly large and attractive exhibition. And first we would observe that it is noteworthy in this respect that it is "large and fine," notwithstanding the absence of the bait of medals, which proves so attractive and alluring to many. Of course there are some whose contributions are seldom far off from an exhibition when allured by the temptation of a possible medal award, but who in one like the present seem to prefer remaining absent. When will the time come when photographers, like painters, will exhibit their works solely for the love of the art and the honour that redounds to themselves, unmixed by the less worthy consideration of reward in the form of medals?

The Exhibition is very rich in what appertains to the history of photography. There is a *facsimile* of the earliest known sun picture, or heliotype, by Thomas Wedgwood, about 1791-3, kindly lent by B. J. Sayce. There are several Daguerreotypes of Daguerre, Faraday, Goddard, and others, taken in 1841 and the subsequent few years, together with Talbotype negatives and prints from them by various of the early artists, among them being the famous Edinburgh calotypist, D. O. Hill, who flourished in that capacity in 1843. There is a portrait of Sir John Herschel, which must possess great interest for all who are acquainted with the scientific labours of that eminent man in the earliest days of photography; and, almost better still, there is exhibited in one of the show-cases his famous letter to Mr.

Brothers, of Manchester, in which he described his discovery of the fixing powers of hyposulphite. This letter, we think, possesses so great a degree of value as a historical document that we here reproduce it:—

"Collingwood, October 29, 1864.

"SIR,—I think I may very fairly claim the discovery of the hyposulphites as fixing agents, as I believe I was the first to call the attention of chemists to that class of salts and their peculiar habitudes, especially in relation to the insoluble salts of silver.

"In my paper *On the Hyposulphurous Acid and its Compounds*, which bears date Jan. 8, 1819, and which appeared in Brewster and Jamieson's *Edinb. Phil. Journal*, 1819, occur these words:—

'One of the most singular characters of the hyposulphites is the property their solutions possess of dissolving muriate of silver and retaining it in considerable quantities in permanent solution.' (p. 11.)

'Hyposulphite of Potash.—It dissolves muriate of silver, even when very dilute, with great readiness.' (p. 19.)

'Hyposulphite of Soda.—* * * Muriate of silver newly precipitated dissolves in this salt when in a somewhat concentrated solution in large quantity, and almost as readily as sugar in water.' (p. 19.)

'Hyposulphite of Strontia.—* * * Like the rest of the hyposulphites, it readily dissolves muriate of silver, and alcohol precipitates it as a sweet syrup.' (p. 21.)

'Hyposulphite of Silver.—Muriate of silver newly precipitated is soluble in all liquid hyposulphites, and, as before observed, in that of soda with great ease and in large quantities. This solution is not accomplished without mutual decomposition, as its intense sweetness proves—a sweetness surpassing that of honey, and diffusing itself over the whole mouth and fauces, without any disagreeable or metallic flavour.' (p. 27.)

"In a second paper on the same subject, which appeared in the same journal, vol. 1, p. 396 *et seq.*, it is shown (*inter alia*) that the affinity of this acid for silver is such that oxide of silver readily decomposes hyposulphite of soda and likewise the soda in a caustic state, 'the only instance, I believe, yet known of the direct displacement of a fixed alkali *via humidâ* by a metallic oxide.' (p. 397.)

'Hyposulphite of Ammonia and Silver.—Its sweetness is unmixed with any other flavour, and so intense as to cause a pain in the throat. * * * One grain communicates a perceptible sweetness to 30,000 grains of water.' (p. 399.)

"In a third communication, dated November, 1819—'The habitudes of this acid with the oxide of mercury are not less singular than its relation to that of silver.' 'The red oxide is readily dissolved by * * * hyposulphite of soda, while the alkali is set at liberty in a caustic state,' &c., &c.

"The very remarkable facts above described, I have reason to believe, attracted a good deal of attention at the time, and thenceforward the ready solubility of silver salts, usually regarded as insoluble by the hyposulphites, was familiar to every chemist. It would not, therefore, be surprising if Daguerre tried it to fix his plates (*i.e.* to wash off the iodide coating); but I have been informed, though I cannot cite a printed authority for it, that at first he fixed with ammonia, or with a strong solution of common salt.

"For my own part, the use of the hyposulphites was to myself the readiest and most obvious means of procedure, and presented itself at once. My earliest experiments were made in January, 1839, and in my notebook I find:—

'Exp. 1012.—1839, Jan. 29. Experiments tried within the last few days' since hearing of Daguerre's secret, and also that Fox Talbot has got something of the same kind.' [Here follow some trials of the relative sensitiveness of the nitrate, carbonate, acetate, and muriate of silver. I should observe that at that time I did not even know what kind of pictures Daguerre had produced. This process was not revealed till August, 1839.]

'Exp. 1013.—Daguerre's process: attempt to imitate. Requisites—1st, very susceptible paper; 2nd, very perfect camera; 3rd, means of arresting further action. Tried hyposulphite of soda to arrest the action of light by washing away all the chloride of silver or other silvering salt; succeeds perfectly. Papers half acted on, half guarded from the light by covering with pasteboard, were withdrawn from sunshine, sponged over with hyposulphite, then washed in pure water, dried, and again exposed. The darkened half remained dark, the white half white, after any exposure, as if they had been painted with sepia.'

'Jan. 30, 1839.—Formed image of telescope with the aplanatic lens * * and placed in focus paper with carbonate of silver. An image was formed in white on a apia-coloured ground * * which bore washing with hyposulphite of soda, and was then no longer alterable by light. Thus Daguerre's problem is so far solved,' &c., &c.

'Exp. 1014.—Jan. 30, Tried transfer of print and copperplate engraved letters,' &c., &c.

"The publication of Daguerre's process (according to Dr. Monckhoven, for I cannot at present refer to the original document) took place on the 19th August, 1839. My early experiments were printed in the notices of the proceedings of the Royal Society of March 14, 1839, in which occurs this passage in the abstract of a paper read to the Society:—

'Confining his attention in the present notice to the employment of chloride of silver, the author inquires into the method by which the blackened traces can be preserved, which may be effected, he observes, by the application of any liquid capable of dissolving and washing off the unchanged chloride, but leaving the reduced oxide of silver untouched. These conditions are best fulfilled by the liquid hyposulphites.'

'Twenty-three specimens of photographs made by Sir J. Herschel accom-

pany his paper—one a sketch of his telescope at Slough, fixed from its image in a lens.

"This is the image above mentioned as having been taken on Jan. 30, 1839, and was, I believe, the first picture ever fixed for an optical image ever taken in this country—at least I have heard of none earlier.

"At the time of making these experiments, as already mentioned, I had no knowledge of M. Daguerre's process further than the mention of the existence of a process (a secret one) in a note from Admiral (then Captain) Beaufort some time about Jan. 23, 1839. Of course I used paper, not silver, and it was not a suggestion, but a regular and uniform practice, to use the hyposulphite; I never used anything else.—I am, sir, your obedient servant,
"J. F. W. HERSCHEL."

Occupying a prominent position in one of the cases are examples of Léon Vidal's photochromes, or photographs printed in coloured pigments, which will be examined with all the greater interest that attempts are being made at the present time to introduce coloured photographs the pigments upon which are applied, altogether unlike Vidal's polychromes, by the more or less skilled hand of a colourist.

These polychromes are very bright and possess perfect gradation. Let it be understood that this is not a method of applying colour to an already existing photograph in monochrome, but of printing it in colours *ab initio*. The specimens now in Manchester form a portion of some which were brought before the notice of the British Association at their Bradford meeting in 1873, where an account of their mode of production was given by the present owner of them. The process was originally based upon the carbon or pigment printing process, but resembled in principle chromo-lithography. Every different tint shown in the picture implied a separate print, the colouring matter of which was set off or transferred to the sheet upon which the finished picture was finally impressed. As many negatives had to be employed as there were colours to be printed.

This was troublesome, but out of it was evolved a much simpler and better system, namely, one in which collotypic printing formed the means of production. The negatives are prepared as mentioned, that is, there must be as many negatives as there are colours to be produced, and from each negative must be stopped out every part that does not represent one special colour.

Suppose that the subject is a rose tree clad with foliage, and adorned with red flowers. The negatives are obtained by superposition from one original; all but the flowers, the trunk, and the leaves are then respectively stopped out in the separate negatives. Three printing "formes" or surfaces are now prepared, one for each of these negatives; the printing surface being of course gelatine, as adopted in the collotype process. The leaves are first printed, being inked with green. These will appear in all the beautiful delicacy and with all the structural detail visible in the original tree. When the requisite number—hundreds or thousands—of impressions has been printed, the printing surface is removed (one press only is now supposed to be employed), and a second "forme," representing the flowers, is inserted in the bed of the press. This is inked with a transparent red lithographic ink the colour of the flower, and the partially printed proofs are sent through the press a second time, care being taken to keep correct register. A third time the operation is repeated, so as to introduce the brown colour of the trunk and branches. If necessary, colours may be made to overlap.

What is here adduced as a means of printing flowers applies equally to that of landscapes, portraits, and indeed to everything that can be represented by photography.

We close the present article by saying that great praise is due to Mr. Brothers and his colleagues of the Manchester Photographic Society for the ability they have displayed in getting together such an excellent exhibition of photographs, both ancient and modern, a description of which we shall resume next week.

THE POTASH DEVELOPER.

THE season and the weather are with us now to remind photographers that ammonia is a nuisance, either as a developing agent or in any other capacity, and most operators will agree, at least while the present temperature lasts, that it should be banished the dark room altogether. It is not only that its escaping fumes are noxious to health, and that its extreme volatility renders it a very uncertain developer, but it is likely under extreme circumstances to prove really

dangerous, a fact of which I was disagreeably reminded a day or two since when, in moving a bottle of ammonia that had not been opened for some time, the stopper flew out and I was deluged with the contents, liquid as well as vapour, which narrowly escaped my eyes. The bottle had been closed in cool—more than probably, in *very cold*—weather, and after the recent sudden rise of temperature was ready to go off like a bombshell at any moment.

Then, again, the troubles that arise to the health from constant contact with ammonia vapour in a close space are at any time bad enough, but with the temperature at eighty odd and a flood of hot-looking red light coming into the room without any adequate counterbalancing supply of air to temper it, it is no wonder that the additional irritant effect of ammonia vapour on the system should produce headache, lassitude, and loss of appetite, to say nothing of the nasal catarrh it brings on at any time when the system is saturated with it.

From the purely photographic point of view, these objections may be regarded as merely sentimental; accidents to limb or health form no part of an operator's contract, he has to develop negatives. But the same volatility that causes the ammonia to distribute itself so lavishly about the place also causes it to escape from its solutions. If "H. P. R." has reason to complain of the developing uncertainties arising from incorrectly graduated measures as described in his recent letter, I think he, or any one else, would find he suffered infinitely more in the same direction during such weather as the present if the ammonia developer be used without making a fresh solution every few minutes.

For these and other reasons I have long discarded ammonia for all but experimental purposes, finding the carbonates of potash and soda far more reliable, free from smell, cheaper, and what is of the greatest importance, giving *at least* as good results as ammonia. Such, at least, I claim for potash, but I must confess to an absolute dislike to carbonate of soda, on account of the horrible yellow colour it imparts to the gelatine film—not to the image, but to the gelatine which holds it. It is a curious fact that, notwithstanding very many of those who constantly use carbonate of soda declare they are not troubled with the yellow stain, it always appears with me, notwithstanding the use of sulphite of soda, and quite irrespective of the make of plates. If by quick development and the free use of sulphite an uncoloured negative should result, the stain invariably appears on washing; in fact, it seems to be a case on a par with that of the Irishman who asserted that the water of his native village "washed the dirt into yez."

On the other hand, it is alleged against carbonate of potash that it causes frilling where frilling would not otherwise appear; but my experience does not go to that length. I will admit that if a plate be weak—that is, will just bear ordinary treatment, but no liberties in the shape of forcing—potash will search out its weakness; but with the general run of commercial plates I do not think any difficulty need be experienced. If a plate frills with potash, it will not be found difficult to make it frill with ammonia, or even ferrous oxalate. But the remedy is easy, and if the plan be regularly adopted the difficulty need never appear. It is simply to use a strong solution of common salt between development and fixing as recommended some time ago in the JOURNAL.

I am not going to recommend any new formula, for the very good reason that I do not believe in them. A formula for developing is all very well as something to which to stick a man's name as a handle, but if the owner of the "handle" would also invent a formula for the production of images that require strictly uniform treatment, he would better deserve the distinction attaching to him, and would, at the same time, save himself an immensity of trouble in continually altering his formula, as appears to be the practice of such gentlemen with every fresh packet of plates they open.

If ten per cent. solutions of pyro and bromide and a more concentrated solution of alkali be kept, the operator is prepared to "tackle" any plate that ever left its maker's hands with the capacity of making a picture in it. I do not say those solutions would enable him to do much or anything with a square of glass and some spoilt emulsion, but if the plate has the capability of making a negative at all, they will, properly handled, bring as much—in quality, I mean—out of it as the maker's own "extra special" formula. That is the

only formula I recognise—solutions of known strength. Ten per cent. is a convenient strength for the two named, but the alkali is better stronger, so long as it is known that a definite quantity is contained in each drachm.

Before speaking of the strength of solution I employ, I should like to say a word or two regarding the kind of material employed. It is insisted by the author of at least one potash formula that the "pure" article must be used. The recommendation is very good in as far as it offers a better chance—without, however, ensuring—that a definite article is obtained and a solution of uniform strength. But it is not at all necessary, as the "commercial" article at eightpence per pound sold as "commercial purified," or "salts of tartar," is quite as good if only properly used. The only treatment it requires is to have it thoroughly dried before weighing, as it is extremely deliquescent, and being a cheap substance is not kept with any particular care in most retail shops. The pure article possesses the same characteristics, but owing to the greater care used in its storage is not likely to go so far wrong as the cheaper; still, it is always desirable to apply the drying treatment to it also. This is easily done by spreading it on a plate or dish, and leaving it for a sufficient time in a moderately hot oven.

If, however, the operator should hanker after purity he can have it at a cheap rate by adopting the following plan. Instead of buying "salts of tartar" let him ask for bicarbonate of potash, which can be obtained at any chemists or oil shop in the kingdom, and costs the same as the salts of tartar, namely, eightpence the pound—at least, it should at any respectable shop, though some chemists would perhaps charge eightpence an ounce for it if the purchaser looked as if he had as much money about him.

If the operator is chemist enough to perform the operation he should next "ignite" the bicarbonate; but presuming that he is not, let him transfer it to one of the common "block tin" baking dishes and place it in a good hot oven. This drives off the extra atom of carbonic acid, together with an atom of water, and leaves pure anhydrous carbonate of potash. The operation is complete when steam ceases to rise from the salt when stirred. Let it be weighed as soon as cool.

And now with regard to the strength of the solution. The solubility of the pure carbonate is very great, about an equal weight of water sufficing to dissolve it at ordinary temperatures, but so strong a solution would be inconvenient to use. Plates differ very greatly as regards the quantity of the salt they will stand or require, some developing well with as much as twenty grains to the ounce, others requiring only five. Twenty grains to the drachm of solution, or one hundred and sixty to the ounce, will therefore form a convenient strength, one drachm sufficing for one, two, or four ounces of developer as the plate may require.

For general everyday work, when a large stock of solution is made and kept ready for use, it is of course not necessary that the quantities should be weighed out exactly to a grain as in experimental work, a grain more or less in the ounce of developer being of absolutely no moment. We can, therefore, proceed, in quantity, in a more convenient manner than by weighing out exactly so many hundred grains, even if we have the weights at hand. Thus, a pound avoirdupois consists of 7000 grains, and forty fluid ounces of solution containing 160 grains to each ounce will require 6400 grains. If, then, we allow for a considerable quantity of moisture in the pound of salts of tartar as it comes from the oilshop, we may make it into forty ounces of solution, and be pretty certain that it will not be far off the strength of twenty grains to the drachm. If we are a little more particular, and dry the carbonate before dissolving, fifteen ounces to the quart will be very slightly over the mark.

If the bicarbonate be used it must be remembered that one pound of the acid salt represents but eleven ounces of the neutral carbonate, five ounces, all but a very minute fraction, being driven off in the shape of water and carbonic acid gas. If, then, one pound of bicarbonate be converted into carbonate as described, and dissolved to make thirty ounces of solution, each ounce will contain within one-twelfth of a grain over the required quantity.

I feel certain it would be to the interest of large establishments to make such stock solutions in quantities sufficient to last for some weeks. The materials are cheap enough and the quantity of solution

actually used is very small, so that in the concentrated state not much storage room would be required. The gain in uniformity of work from always using *the same* solution would soon be felt, for I scarcely think any photographic laboratories are likely to vary between their extremes of temperature sufficiently to alter the specific gravity of the solution to such an extent as to alter its developing power.

H. Y. E. COTESWORTH.

ON THINGS IN GENERAL.

DURING the early part of the year I was asked the question, "When shall we hear of photography in colours being invented?" "In all probability in a few months' time," I replied; "as, for the last quarter of a century it has been regularly discovered every two or three years, and it is now about time it was invented again." My prophecy came true sooner than I anticipated, and all honest photographers must feel almost ashamed of their profession to see the impudent way in which the public are being gulled by a few astute advertisers, who are now exploiting this ever green field of innocents. One would have thought that the experience of a few years ago would have served for almost two generations. My readers cannot fail to remember the inventor who managed to net some considerable sums of money from a credulous public which applied for shares in a company launched for working a photography-in-natural-colours plan. Then, as now, the daily papers, by their gorgeously worded articles, unsuspectingly lent their aid to the deception, and again is the same sorry game being played.

All these pseudo photography-in-colour processes come at a most inopportune time for the progress of true science, for we have once more among us, one might almost say, that talented worker in the theory of photography, Mr. Carey Lea, and I hail with enthusiasm the familiar and respected name, joining with Mr. Hanson, of Leeds, who wrote a week or two ago, in offering my sympathy in the painful cause of his long absence and in all good wishes for the future. Such workers in the cause of science are few and far between—we cannot afford to lose them; and every one will acclaim Mr. Carey Lea's return, especially accompanied, as he is, with such loads of good things in the shape of investigations in this most interesting field, the true photography in colours.

We seem likely to have a plethora of changing boxes for a while, and I join with the Editors in their suggestion to a correspondent who sends a box of his own resembling a recently patented instrument of the kind, that, whenever a really efficient improvement is devised, that a description should be published in these pages. There would be then no doubt about priority of publication, a very potent, yet disputable, factor in patent matters. But why changing boxes at all? A set of neat dark slides don't weigh much more, and are infinitely preferable. There are one or two really good changing boxes in the market, but defend me from the majority of them! I know of a photographer who possessed one such affair who went with a chosen few to the Isle of Man, on photographic pleasures bent. They all set to work upon a lovely view, but our friend of the box appeared rather dilatory. The rest of the party exposed their plates and prepared to retire. The changing box owner, however, was fixed: his plate would go neither in nor out. He coaxed it, tried first gentleness then force, used strong language, all to no purpose. At last our friend took that changing box, threw it in the air and let it drop, thud! He jumped upon it, kicked it, and, as far as he knows, its remains lie whitening upon that Manx hill yet. He is now a happy man; he owns no changing box, and never intends to.

Photographic journeying reminds me of the suggestion of Mr. Dunmore to send a list of suitable places with their capabilities and facilities succinctly and shortly stated. There can be no doubt such a list would be useful, and the suggestion will tend to rehabilitate the old recommendation—I forget whose—that the "Where-to-go-with-the-Camera" series of this JOURNAL should be reprinted in book form. I doubt whether it would pay; but if only the Editors would classify, condense, abstract, and otherwise reduce in bulk, and re-publish—after the style Mr. Dunmore suggests—this series, the thing would be started on a first-rate basis, and many ardent and skilful photographers who have either no time to contribute so fully as hitherto been done to the series or are deficient in confidence to

write a brief article, would feel no hesitation at adding his quota in Mr. Dunmore's style. Mr. Editors, will you not take the hint and start such a list forthwith? it would be invaluable, and ultimately might be reprinted with some probability of there being no loss through the transaction.

Technical printing is always a difficult matter to get done successfully and correctly, though I must congratulate the publishers of this periodical upon the successful way in which such printing is carried out in these pages. I wonder who is responsible for the benzole diagram on page 359. It is neatly set up, though it is rather wanting in symmetry. But I want to know what has become of the H atoms: it is a new kind of benzole that exists without hydrogen! The writer of the article experiences a difficulty in imagining how "pyrogallic" is made at the price, and is sure it cannot be made from gallic acid; but where is the need of isolating the acid from the galls? Processes have been published long ago for making "pyro" direct from the galls by sublimation. I remember making some in that manner nearly thirty years ago, and I am quite sure the process was quite as useful as Dr. Kenyon's method for preserving or storing solution of sulphate of iron. I think if he will keep his solution in a stoppered bottle, the stopper of which has been well greased with vaseline or other such compound, he will be able to keep his sulphate unchanged for a long period of time. His method is, no doubt, a successful one, but is too cumbersome; besides, he would find that the portion of solution in the tube in the neighbourhood of the pinchcock would be found oxidised after it had been left unused for a fortnight. At the very least, he should have recommended that some portion should be allowed to run to waste before taking a supply for mixing into a developer, if absolute freedom from oxidation be—as I should doubt—of such prime importance.

Still attracted by chemical matters, I would say, How is it that the hydrosulphurous acid method of development is introduced as a novelty by the French experimenters named in the account given in this JOURNAL for June 3? I have not my files of JOURNALS at hand to refer to, but I am sure that this method of developing was treated at length in an editorial given, I should say, at least a dozen years ago. "There is nothing new under the sun," apparently.

A writer over the signature of "Procella" goes out of his way to fall foul of metal slides for use in photo-micrography. Most eacophonous word that this is, I wish some one would invent a better! I cannot at all follow him in his complaint, for any one with much experience in such matters knows that where the objective without eye-piece is used, any loss of sharpness through the difference of a small fraction of an inch in the relative position of plate or focussing screen is absolutely unrecognisable when high powers are used.

I will conclude by giving my experience as to the keeping power of dry plates, with regard to which a recent correspondent wrote. I have some of a particular brand, which, to my thinking, are the best I ever employed, that are only about eighteen months old, yet are completely useless for about an inch and a half of margin round the whole of the plate; but, at the same time, I have other brands, purchased at a prior date, that appear to be as good now as on the day I first received them, the two sorts being stored in immediate juxtaposition.

FREE LANCE.

ACCESSORIES OF THE LANTERN.

CHAPTER IX.—THE MIXED GAS JET (continued).

HAVING decided upon the shape and aperture of the nipple (see last chapter), we have now to design the mixing chamber of the jet, for it must not be supposed that any method of conducting the gases to the nipple will suffice. There is no difficulty about the commingling of oxygen and coal gas; if they travel in company through a pipe three inches long and a quarter inch bore they will be as well mixed as is necessary to produce the best light. What we have to strive after is to supply the nipple with the two gases mixed together, and proceeding up the supply tube to the nipple in a condition of entire freedom from eddies and cross currents. If the gases reach the nipple with an eddy and a whirl there will be a loud roaring or hissing noise with a small aperture, and the light will go out altogether with a large one, owing to the flame "passing back."

When I mention small apertures, I refer to the size of bore

generally adopted for commercial jets, which is often not larger than one-twenty-fourth part of an inch in diameter; by a large aperture, I mean a bore of about one-thirtieth of an inch, which will consume three times as much gas as the former, and give three times as much light with the same gas pressure.

The chief advantage of the large apertures for screens of moderate size is the great reduction of the weights that have to be put on the pressure boards; a half-hundredweight will give as good a light with the large bore as three hundredweights with the small one, the two nipples being then about equal in the quantity of gas consumed.

If the mixed gas jet makes a noise while in action, and the nipple is not in fault, the noise can usually be stopped by inserting cotton wool in the pipe between the nipple and the mixing chamber in small quantity, so as not to sensibly lessen the amount of gas consumed. The action of the wool is simply to break up the miniature cross currents of the gases, and so produce the smooth flow necessary for a noiseless light. Such a cure is, of course, only a temporary one; it is far better to alter the metal work of the jet, or supply a new mixing chamber.

About a year ago I described in these pages the jet nozzle, shown in Fig. 1, which is a full size section. This pattern is the best I know of at present if great power of light is required; with an aperture of about one-twelfth of an inch, and a high gas pressure, a light of 800 candles can be had with it. It is made of brass in three

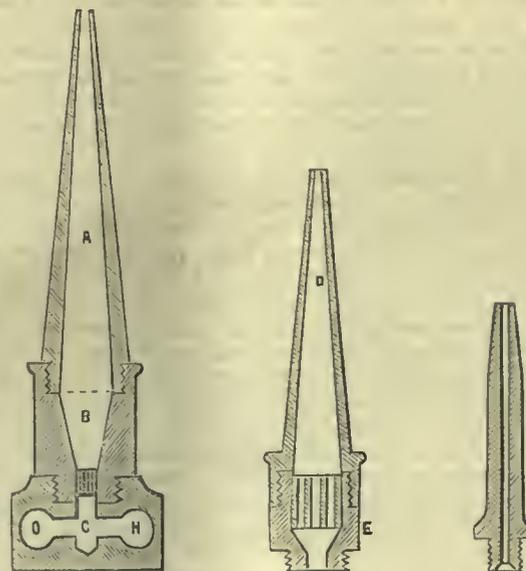


Fig. 1.

Fig. 2.

Fig. 3.

Sections of jets drawn full size.

parts. A is the nipple, a cone two inches long, and half an inch external diameter at the base, tapering to one-eighth of an inch at the point. The internal bore is also a cone, five-sixteenths of an inch diameter at the base, and one-fifteenth (or up to one-twelfth) at the orifice. B is the mixing chamber, shaped internally as an inverted cone, with a diameter of five-sixteenths of an inch at the top, and three-sixteenths of an inch at the bottom. At the lower end of B is inserted a brass plug, perforated with three or more parallel holes made as large as the size of the plug will admit. C is a small brass block, into which are screwed the pipes that convey the oxygen and coal gas respectively.

This nozzle is rather a long one, and might prove inconvenient in some lanterns; in such cases a nipple made like Fig. 2 may be used—this is a very effective and useful pattern, and will give a silent light of 600 candles. The upper piece D is nearly like A in Fig. 1; it screws on to E, in which is a brass plug one-fourth or five-sixteenths of an inch diameter, and one-fourth of an inch long. This plug is perforated with seven parallel holes, one being in the centre, and the other six arranged round it in a circle; these holes may be one-sixteenth of an inch in diameter. The piece E is screwed into a block similar to C, Fig. 1. If this pattern, Fig. 2, is still too long, the nozzle D may be shortened, but I do not recommend this

unless absolutely necessary, as a smaller aperture would have to be used.

These two jet nozzles are very different to the pattern generally adopted by opticians, and to change the latter style to those shown in Fig. 1 or Fig. 2 would probably be rather expensive, necessitating an entirely new front piece or mixing chamber. Those who would like to increase the power of their jets without interfering with the brasswork can do so by unscrewing the small nipple, with its platinum tip, and screwing in its place a brass nipple made like Fig. 3, which is twice as long as the ordinary nipple. Fig. 3 is made of a piece of brass wire, one-fourth of an inch in diameter, and about one and a half inches long. One end of it is tapped to fit the screw of the nozzle of the jet; the other end is made somewhat cone-shaped, so as to be one-eighth of an inch wide at the point. A hole, one-fourteenth of an inch in diameter, is then carefully drilled from end to end; this hole must have a smooth internal surface, and be of the same small diameter throughout. This nipple possesses in itself the property of destroying eddies in the gas, which, owing to the small size of the bore in comparison with its length, will have spent their force before reaching the orifice. It will therefore act well on any jet, and may even be screwed direct into a block like C, Fig. 1, though it is better to allow the gases to mix in a short curved tube before reaching the nipple, as is customary in commercial jets.

Fig. 3 is not quite so powerful as Figs. 1 and 2, but it will give a silent light of 400 candles, and with a higher pressure of gas a still better light, possibly accompanied by a little noise. The three patterns of jet nozzles here described are the outcome of a series of experiments I tried with the view of improving the power of the mixed gas jet, by which I was at first unable to get a better light than 200 candles—a most unsatisfactory illumination when screens of over twenty feet had to be used.

It must be distinctly understood that the various candle-powers stated above can only be obtained with coal gas. Pure hydrogen cannot be used with these large apertures, as the light instantly goes out through the flame passing back. Nor are these jets suitable for use with the ether tanks made to replace coal gas. The flame will burn, it is true, if there is a good pressure on the oxygen bag, and the light then is very brilliant. The three jets illustrated are perfectly silent when used with coal gas, yet with the ether tanks they make a powerful roaring noise, quite insupportable in a lecture exhibition. If a mixed gas jet is required to burn hydrogen or ether vapour, it must have a small aperture about one-twentieth of an inch diameter—a silent light of about 300 candles is then obtainable. Fortunately, few persons use anything but coal gas; other tanks are unsafe unless Rev. Hardwick's ingenious pumice chambers are used to prevent explosions.

A powerful limelight will do more to increase the success of an exhibition on a large scale than superior quality in the slides can accomplish. I have noticed that a set of ordinary tinted photographs, worth, at the most, three shillings each, when shown by a light of 700 candles on an eighteen feet screen, produces a far better impression with an average audience than will the most elaborate and expensive slides, costing, perhaps, twenty shillings each, if the latter are shown with the ordinary commercial jets.

I have heard people who were not lanternists remark that the pictures in the first case were far superior in quality to the more expensive ones, although when the two sets of slides were shown by the same light the verdict was, of course, reversed.

ALBERT WM. SCOTT.

ON A MULTIPLEX DARK SLIDE FOR CARD-MOUNTED FILMS.

[A Communication to the Birmingham Photographic Society.]

At our last meeting I read a short paper on my *Card-mounted Flexible Glass Films*, and I should like to supplement it by a description of a slide which is much better suited for them than the ordinary single or double dark slide, as I consider that to have a perfect film is of little use unless you have also some contrivance which allows of the operator taking advantage of reduced weight of films to carry a greater number than he could plates.

I think the main object to be achieved by the use of films is to make a full day's work possible, if opportunity offers. I think nothing can

be more tantalising than to work with a limited number of plates or films.

The slide I wish to describe to you is a modification of what I have used for plates, but in consequence of the films being mounted on an opaque and light material, it is only half the trouble and half the work as compared with glass plates. I did not mention this in the paper at our last, as I had not proved the article in actual use, and romancing does not do instead of work and trial. I have had some years' practice at films in one shape or the other, and am free to say that before this last development of films I always preferred working with plates, not liking my own medicine. With the trials I have made the last month, I conclude I shall not go back to plates for any outdoor purpose.

The slide, as you see, is about the thickness of two double dark slides. It will hold thirty card-mounted films; these are placed in the slide with the sensitive sides all facing the front, and do not require anything between the sensitive surface of one film and the back of the next film. When an exposure has been made, all that is needed is to remove the exposed film from the front of the slide to the back. This is such a simple process that it can be done by feeling in the dark bag. As soon as the exposed film is removed, the one underneath is ready for exposure.

The proper order to proceed is to pass the slide into the dark bag with the sensitive side of the films uppermost, to unbolt the slide, take the exposed film from the top of the box, lay it in the bag, fasten the bolt, turn the slide over, and insert the exposed film, and repeating this until a distinctive feeling card has come to the surface, which will show that all have been exposed. It is easy to change a film the whole-plate size in thirty seconds. My son says he can change the $\frac{1}{2}$ size in ten seconds. Last Saturday, at Kenilworth, I made twenty-six exposures in rather less than two hours. There are here a number of negatives and prints taken from the films for your inspection, which are taken in the slide I am describing. I will give the weight of several sizes of slides fully charged with thirty films:— $\frac{1}{4}$ size, 17 ounces; $\frac{1}{2}$ size, 28 ounces; $\frac{3}{4}$ size, 44 ounces. The slide can be adapted to any camera.

A. PUMPHREY.

CONTINENTAL PHOTOGRAPHY.

[Translations and Abridgments.]

INTENSIFYING NEGATIVES.

M. RICHARD, of Dampierre, writes to the Photographic Society of France that a negative is reduced by being plunged into a solution of red prussiate of potash, and is equally reduced by a solution of perchloride of iron, but that if it is first plunged into perchloride of iron, then into red prussiate of potash, it assumes a bluish green colour all over, and becomes vigorous almost beyond limit, according to the strength of the solutions and the number of times it is transferred from the one to the other. If the two baths be mixed the effect takes place at once, and further immersions have no additional effect. It is necessary to well wash the surface of the negative between the immersions in each of the two baths. The green tint passes easily to bright blue by a little washing with a feeble solution of ammonia. It remains to be ascertained whether the colours unfavourable to printing can be discharged by any method without at the same time weakening the negative; possibly in some cases the blue tint may prove to be of advantage.—*Bulletin de la Société Française de Photographie.*

THE DEATH OF M. LEMERCIER.

Le Moniteur de la Photographie announces with regret the death of M. Lemerrier, whose name has long been connected with photography. He purchased the patents of Poitevin and of Albert, of Munich, and in his workshops the first important works by photo-mechanical processes in France were printed.

AN ANILINE BLACK PRINTING PROCESS.

Herr Endemann writes that the paper intended for use in this process should be well sized with an aqueous solution of gelatine in the proportion of one to fifty. The sensitising solution consists of:—

Chloride of sodium	48 grammes.
Bichromate of potash	48 "
Vanadate of soda	0 gr. 10.
Distilled water	960 c.c.

Another solution is made of:—

Sulphuric acid	96 c.c.
Water	480 "

When this is cold it is added to the first solution; the paper is floated upon the mixture, and then allowed to dry in a dark place.

The paper when dry, or while slightly damp, is then exposed under a printing frame for about seven minutes to the action of light, after which it is kept in the dark until it is desired to develop the image. It is then exposed for one minute to a mixture of the vapours of water and aniline, next it is placed in an atmosphere of vapour of water kept at a temperature of from 24° C. to 30° C. The image is thus developed in black lines upon a green ground. To remove the green colour it suffices to soak the paper in a one to six solution of ammonia; the print has then to be dried and pressed.—*Photographisches Archiv.*

INCREASING THE SENSITIVENESS OF COLLODIO-BROMIDE PLATES.

A plate is coated with washed collodio-bromide emulsion, in which the haloid salts are bromide of zinc and chloride of cadmium in the proportion of four to one. After coating with the emulsion, the plate is washed in water, then flooded with the following solution:—

Beer	500	c.c.
Water	500	"
Egg albumen	25	"
Ammonia.....	30	"

The plate is again washed, and then dipped in the following solution:—

Pyrogallol	1	gramme.
Beer	500	c.c.

The plate, when dry, is much more sensitive than one prepared by the ordinary wet collodion process.—*Photographisches Archiv.*

NEW EXPERIMENTS ON THE BITUMEN PROCESS.

The bitumen process is well known, but Professor Husnik has published some new details about it. He says that pulverised Syrian asphalt should be dissolved in double its weight of German essence of turpentine, and agitated every half hour for two days, until a thick syrup is obtained. French or Austrian essences do not give the same results. By experiment the operator finds out what quantity of sulphuric ether should be employed to dissolve the useful portion of the asphalt. To do this the syrupy liquor is mixed with some of the ether, shaken up with it, and then allowed to rest in a covered vessel; the supernatant solution is then poured off, and more ether shaken up with the sediment and similarly poured off, until additional ether will dissolve scarcely any more. This point can be ascertained by allowing a little of the later ethereal solutions to evaporate. These ethereal solutions should be mixed together, the ether nearly all distilled off, and the thick residue spread out upon zinc plates until it is almost completely dry; the drying will occupy three days, or perhaps four. All these manipulations should be performed by daylight, and not near a candle flame or fire.

The purified asphalt should then be dissolved in chloroform, or in benzine which has been completely freed from water, otherwise the solution will not cover the plate evenly. In three or four minutes this solution will give a dry film of asphalt. With the benzine mix one per cent. of Venice turpentine, add the asphalt, and shake until it is dissolved. It is then diluted to such an extent that a film of it dried upon zinc has a golden yellow colour. The bottle to hold the solution should be made slightly warm, after having been washed with water and well dried by first washing with alcohol and afterwards with ether. Its mouth is closed with a cork.

To use the solution, a well polished plate of zinc or copper is coated with it by the aid of a brush, and the plate is then placed upon a truly horizontal whirling-table, in such a way that by rotation a perfectly even film is obtained.

The time of exposure under the negative is from five to thirteen minutes for sunlight, and from three-quarters of an hour to four hours for printing in the shade. Unfortunately the zinc plate must be very thick for etching purposes, and very vigorous negatives are necessary. The most important point is the development of the image, which must be done in a flat dish and by simple washing, for the application of a brush would injure the image. The parts acted upon by light should appear in three or four minutes. The turpentine is then poured off, and the plate washed under a current of water. The plate is next placed in an acid bath, strength one to twenty, drained, dried, varnished, inked, then retouched and engraved in the ordinary way.—*L'Amateur Photographe.*

Class I.: Oil Paintings.—Paintings on canvas, on panel, and on other grounds.

Class II.: Various Paintings, Drawings, &c.—Miniatures, water-colour paintings, pastels, and drawings of every kind; paintings on enamel, earthenware, and porcelain; designs in glass and clay; cartoons for stained glass windows and frescoes, &c.

Packages forwarded from countries and colonies represented at the Exhibition should be addressed, "To the Commissioner for —, Centennial International Exhibition, 1888, Melbourne, Victoria, Australia," and the following information must be written on the outside of each package:— (1), The country from which the package comes. (2), Name or firm of exhibitor. (3), Address of the exhibitor. (4), Group and class to which exhibits belong. (5), Total number of packages sent by same exhibitor. (6), Serial number of that particular package. Each package must contain a list of contents. Packages containing goods intended for the Exhibition must likewise have painted on them, as a distinctive mark, the following letters and figures within a triangle, thus—"C. I. E. M. 1888." Packages from foreign countries must also be marked with the colours and devices of their national flag. Foreign Commissioners are particularly requested to send to the Executive Commissioners, Melbourne, as soon as possible, a specification of the packages forwarded, with their distinguishing marks.

Exhibits will be admitted free of duty for the purpose of exhibition. Customs entries, transportation, receiving, unpacking, and arranging the products for exhibition must be undertaken by the exhibitor at his own expense. No charge will be made for carriage of goods intended for exhibition over the railway lines. Arrangements will be made by which all goods intended for exhibition can be carted from the wharves, or the several railway stations, to the Exhibition grounds at a fixed scale of charges.

ADVANTAGES OF ENLARGING FROM SMALL NEGATIVES.

At a meeting of the Camera Club of Syracuse, N.Y., held on March 18, 1887, a paper was read by Dr. F. W. Marlow on some of the advantages for the landscape photographer of using a small camera with short-focus lens, and enlarging from the negative thus obtained. It was pointed out that there is only one point from which a photograph can be correctly seen, that point being situated at the focal distance of the lens in front of the centre of the picture. Under this condition only do objects in the picture occupy the same angle with regard to the eye that they do in nature.

The results of looking at photographs from any other than the correct point of view, such as the dwarfing of distant hills, and the magnifying of objects in the foreground, such as hands and feet, were then referred to. It was stated that photographs are very seldom done the justice of being looked at from the proper point of view, in proof of which it was instanced that few amateur photographers could tell the exact focal length of their own lenses, and that photographs of landscapes, buildings, &c., were almost invariably sold without any note as to the focal length of the lens with which they were taken. Photographs should have a note on the mount, indicating the proper point of view.

People with ordinary sight find it inconvenient or wearisome to look at photographs at a shorter distance than twelve inches, a greater distance even being generally preferred. (The use of a convex lens or the existence of near-sightedness permits a photograph to be brought to any required distance.)

For this reason a direct photograph ought not to be made with a lens of less than twelve inches focus, considerably longer focus even being preferable.

A long-focus lens involves a large and heavy camera, large plates, &c. (unless the photographer be satisfied with including a very narrow angle in his picture), making the outfit too heavy and cumbersome to be carried far.

Short-focus lenses, then, produce pictures which cannot be looked at with ease from the proper point of view; long-focus lenses involve too cumbersome an apparatus. The way out of the difficulty is to use a small camera and short-focus lens for making the negative, and to enlarge so that the picture may be put at a convenient distance from the eye and still occupy the same angle that it does in nature.

Besides the obvious advantages of lightness, small space, inexpensive-ness, &c.; there are two other greater but less obvious advantages:—First, much greater definition can be obtained in the near foreground by this method than by taking the photograph direct with a long-focus lens. For instance, with a lens of twenty inches focal length, the distance being in focus, the nearest point which can be said to have sharp definition on the focussing plate is 25.5 metres in front of the lens. With a lens of four inches focal length, everything up to a distance of 1.1 metres is sharply defined. This definition can be reproduced in the enlargement. This is an enormous difference in favour of enlargements from negatives taken with short-focus lenses. The second advantage which, so far as is known to the writer, has not been previously described, is that a single landscape lens can be used for all subjects, even those containing straight lines, both for the negative and for the enlargement, the distortion produced in the negative being corrected in the enlargement.

On the general principle that a ray of light in passing between two

CENTENNIAL INTERNATIONAL EXHIBITION, MELBOURNE, AUSTRALIA.

THERE is to be a great Exhibition in Melbourne next year. Photographs do not rank as *Works of Art*, but are relegated to the second group under *Education and Instruction: Apparatus and Processes of the Liberal Arts*, as follows:—

points *a* and *b* lies in the same path whether its direction be from *a* to *b* or from *b* to *a*, whatever refracting media it passes through, it seems fair to suppose that if the direction of the rays of light in the camera were reversed, and the negative be made the source of light, that rays of light coming from the curved lines, &c., would after emergence from the lens reassume their original paths, and no distortion would be observable in the image so formed. There would be an exact reproduction of nature.

To investigate matters a little more closely; the distortion which accompanies the use of the single landscape lens is due to the use of the diaphragm, the kind and degree of the distortion varying with the relation of the diaphragm to, and its distance from, the lens. When the diaphragm is in front of the lens, the distortion produced is "barrel-shaped," straight lines becoming curved, with their convexity outwards. When the diaphragm is behind the lens, the convexity of the curve is inwards.

The further away from the lens the diaphragm is placed, the greater is the distortion. The method ordinarily employed to correct this distortion is to place a lens both in front of and behind the diaphragm.

The same correction is virtually made by using a diaphragm in front of the lens when making the negative, and behind it when making the enlargement. In the first process there is a tendency to the curvature of straight lines inwards, and in the second to the curvature of straight lines outwards; the one counteracts the other and leaves the lines finally straight.

This is probably only absolutely true when the subject is enlarged to its natural size; in smaller enlargements, some of the same kind of curvature seen in the negative may be expected to remain in the enlargement, but even this may be got rid of by increasing the distance between the diaphragm and the lens during the enlarging process.

Direct photographs and enlargements were shown, demonstrating the correction of distortion to the satisfaction of all members present.

THE ANNUAL VISITATION OF THE ROYAL OBSERVATORY.

From the Report of the Astronomer-Royal to the Board of Visitors, read at the annual visitation of the Royal Observatory, we learn that above the extended portion of the upper computing room a dome 18 feet in diameter is to be erected, in which it is proposed to mount a Cooke 6-inch equatorial, a photo-heliograph tube being attached to the same mounting. The combined instrument will command a complete view of the sun throughout the day—an important consideration, as the work of the present photo-heliograph is seriously interfered with by trees and the Lassell dome. The new instrument will be available for occultations, phenomena of Jupiter's satellites, and other occasional observations.

Various additions have been made to the Lassell equatorial with a view to making it available for astronomical photography and for general use. A delicate slow motion in R.A. (with differential wheels) and a firm N.P.D. clamping arm with fine motion in N.P.D. have been applied, the steadiness and general usefulness of the telescope being greatly increased by these additions. The Corbett 6½-inch refractor has been mounted below the tube of the reflector and parallel to it to serve as a directing telescope in taking photographs, and also for observation of occasional phenomena. A camera to take circular plates 8½ inches in diameter (giving a field 1° 58' in diameter) has been mounted at the principal focus of the Lassell mirror, and some trial photographs of the moon, Procyon, Regulus, γ Leonis, and Præsepe, have been taken.

The construction of the new 28-inch refractor has been delayed by difficulty in obtaining the discs of glass. Messrs. Chance are engaged in removing a bunch of fine veins from the flint glass disc, and have every hope of being able very shortly to report the disc practically perfect; and M. Feil's successor has successfully moulded a crown disc from which he believes that he has removed all defects.

The south-east and Sheepshanks equatorials are in good order. Some trouble has been experienced with the water supply for the driving clock of the former instrument, and an alteration in the arrangements for maintaining the pressure has been made at the Kent Waterworks, since which the working has been found quite satisfactory.

The Cooke 6-inch equatorial is being mounted in the south ground for trial as to the practicability of using curved plates for stellar photography and other questions which have been raised at the Paris Conference on Astronomical Photography.

A photographic corrector, consisting of a concave crown and convex flint lens (in contact), placed about 30 inches within the focus, has been applied to the telescope of the south-east equatorial to correct the chromatic aberration of the object glass for the photographic rays without alteration of the focal length. A Dallmeyer doublet (formerly used in the photo-heliograph) has been employed to enlarge the primary image about 7½ times, so as to give on the photographic plate an image on a scale of about 0.45 inch to one minute of arc, or 15 inches to the sun's diameter. A number of trial photographs of Castor, γ Virginis, Venus, Jupiter, and Saturn, have been obtained. The photographs of the double stars appear to be susceptible of very accurate measurement, and several of the photographs of Jupiter show the four satellites, the beta, and the red spot. A photograph of γ Virginis, showing the components widely separated, has also been taken at the primary focus, the Dallmeyer enlarging doublet having been removed. It is intended also

to use the photographic corrector with the Dallmeyer doublet to obtain photographs on a large scale of sunspots, craters on the moon, and other objects of small angular dimensions. The field of view with the photographic corrector is necessarily very restricted.

For the year 1886, Greenwich photographs are available on 199 days, and photographs from India and Mauritius filling up the gaps in the series on 164 days, making a total of 363 days out of the 365 on which photographs have been measured, the record being thus practically complete for 1886.

As regards the photographic reductions:—The Greenwich photographs have been measured in duplicate as far as 1887, April 28, and the measures have been completely reduced so as to exhibit heliographic longitudes and latitudes of spots and areas of spots and faculae. The photographs from India and Mauritius have been received from the Solar Physics Committee as far as March 10 and February 20 respectively, and these have all been measured, and the measures completely reduced.

The Report concludes with the following general remarks:—"As the result of an International Congress on Astronomical Photography held at Paris in April on the invitation of the French Academy of Sciences, at which fifty-six representative astronomers from all parts of the world were present, a scheme has been approved for the formation of a photographic map of the heavens by the concerted action of a number of observatories in both hemispheres. This scheme provides for two series of photographs, the one intended to contain all stars down to the fourteenth magnitude inclusive, and the other, taken with short exposure, specially designed to give accurate positions of brighter stars down to the eleventh magnitude, so that it may be possible to form an extensive catalogue of reference stars for the first series, and thus to give the means of accurately determining the position of any star on the photographic map down to the fourteenth magnitude. The instruments with which this work is to be jointly carried out are to be photographic refractors of 0.33m. (13 inches) aperture and 3.43m. (11 feet 3 inches) focal length, and the directors of ten observatories have already announced that they are prepared to take part in the enterprise."

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 8281.—"Registering the Exposures of Sensitised Films as used in Roll Holders for Photography." W. ROGERS.—Dated June 9, 1887.

No. 8374.—"Holding Photographic Films and Changing the Same, and for Holding Dry Plates." G. V. J. PORIN.—Dated June 10, 1887.

No. 8472.—"Improvements in Photographic Dark Slides." W. MIDDLEMISS.—Dated June 13, 1887.

No. 8493.—"Improvements in Protectors, Cases, or Wrappers for Cards, Photographs, Books, Samples, Patterns, and the like, during Transmission through the Post." G. A. HEARN.—Dated June 13, 1887.

PATENTS LAPSED.

No. 1007.—"Photographic Cameras." J. H. HARE and another.—Dated 1883.

No. 1061.—"Sensitising Photographic Paper." Communicated by West. W. R. LAKE.—Dated 1883.

PATENTS COMPLETED.

IMPROVEMENTS IN THE MANNER OF APPLYING GELATINE AS A SUBSTITUTE FOR PAPER OR GLASS IN THE MANUFACTURE OF DRY PLATES FOR PHOTOGRAPHIC PURPOSES.

No. 9460. JOSEPH BROWN, 3, Stanley-terrace, Norbiton, Kingston-on-Thames, Surrey.—July 21, 1886.

This invention has for its object improvements in the use of transparent gelatine as a substitute for glass or paper for the support of the sensitive gelatinous films used for photographic purposes.

My mode of proceeding is as follows: I take a sheet of paper, which I coat with a layer of gelatine. This, when dry, I coat with another layer of wax or grease. On this surface I proceed to place a sheet of insensitive transparent gelatine by means of a vacuum. This sheet of gelatine it has sufficiently dried on its support I proceed to coat with a layer of any of the usual sensitive photographic emulsions. This is left to dry, and then cut up to any required size. This prepared gelatine attached to its paper support is now ready to receive the photographic image. I now proceed to develop the image by any of the well-known methods. After the image is developed, I proceed to place the photographic image face downwards on a sheet of glass or other prepared surface; when sufficiently dry, I take away the paper support and leave the coated gelatine to dry completely; when dry, I lift up the sheet of gelatine which carries with it the photographic image, and which is now ready to be printed from by any of the usual methods.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—The process herein mentioned of applying gelatine as a substitute for glass or paper in the manufacture of dry plates for photographic purposes in the manner and by the means and for the purposes herein set forth.

AN IMPROVED PHOTOGRAPHIC CAMERA STAND.

No. 3270. JAMES LAUDER, 43, Blessington-street, Dublin.—March 3, 1887.
The object of this invention is to enable the photographer to take photographs of any object even as low as the ground, whilst, by an instantaneous movement, an object can be taken at a great height.

The simplicity of construction of the stand together with its facility and rapidity of manipulation render it of considerable importance, being far superior to any contrivance at present adopted, as much time and labour is required to wind up the machines at present in vogue.

The camera stand, the subject of the present invention, consists of a vertical framework composed of four uprights or standards of gun-barrel or some suitable tubing, held together by frames of the same material top and bottom, each of the standards is provided at the lower extremity with a caster or roller on which the stand runs.

The table or board on which the camera rests is a suspended one, being hung from its corners by weighted cords or chains, the weights running up and down inside the hollow uprights of the frame, whilst the cords or chains pass over sheaves or pulleys mounted at the angles of junction of the framing of the stand, or they may be placed in any convenient position, and if desirable a less number both of cords, chains and pulleys may be used.

The movable and slidingly adjustable table or board consists of an upper frame of wood or other suitable substance, to which the camera is attached, in conjunction with a second frame situated or placed beneath the first or upper one, and sliding in grooves arranged for the purpose on the upper frame.

The outer angles of each frame are curved to suit the shape of the four uprights, between, and up and down which this suspended table travels. Each of the curved corners are padded with indiarubber to ensure contact, and give it a hold on the uprights when in position.

The two frames are kept distended and in contact with the four supports by aid of indiarubber or other springs. The object of this arrangement is to retain the table rigidly in any position in which it may be placed.

The table is released from its rigid position by gripping in the hand and drawing together two handles, one mounted on each frame, or by some arrangement producing a like result; this movement counteracts the effects of the springs, and the table being reduced in size by this means admits of its being raised or lowered to any angle or position that may be required.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
June 20	Notts	Institute, 9, Shakespeare-street.
" 20	Blackburn	
" 21	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
" 21	Bolton Club	The Studio, Chancery-lane, Bolton.
" 22	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 23	London and Provincial	Mason's Hall, Basinghall-street.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. James Glaisher, F.R.S., President, occupied the chair.

Sir Coutts Lindsay, Bart., Mr. Octavius Smith, and the Hon. Reginald Dudley Brougham, were elected members of the Society.

Mr. EDGAR W. CROOKSHANK read a paper upon *Photo-Micrography and its Value in Biological Research*, in which he set forth the results of two years' work on minute organisms. He described various forms of apparatus previously used in such work, and said that photographs of small organisms were of more value than drawings, because they were free from any unconscious bias on the part of the observer, whose drawings might satisfy himself, but did not always give satisfaction to the sceptical. This was the reason why Koch availed himself of photography, and in 1877 published a series of photographs of dried and stained bacteria; the *flagella of Spirilla* were photographed by him after the object had been stained brown; those objects which admitted only of being stained blue or red were photographed upon eosined collodion, but the exposures were long and the results indistinct. In 1881 Koch published a new series of photographs, some of which were excellent, especially those in which the object had been stained brown. In 1885 Hauser, of Erlanger, produced photographs of bacteria, showing an advance on all that had been done before; they were of practical value. His specimens had been stained brown and mounted with Canada balsam, a method which cannot be applied in all cases. Dr. Van Ernuengen showed a way out of previous difficulties; he first proved the distinct value of orthochromatic plates in such work by producing photographs of *Comma Bacilli* which had been stained red. In 1881 Clayton & Tailer issued orthochromatic plates commercially in Paris; he (Mr. Crookshank) used their plates in photo-micrographic work, and employed apparatus made for him by Messrs. Swift & Son. The apparatus consisted of a oxyhydrogen lantern, with a three-inch condenser, consisting of two plano-convex lenses; the light next passed through an Abbe condenser, which concentrated it upon the object, which was held upon the wide stage of a Zeiss's stand; the said stand was firmly held to the baseboard by clamps. The parts of the apparatus just described, including the microscope, could be turned round at right angles and away from the camera, so that the observer could properly centre the light and the parts of the apparatus, and get any desired part of the object into the field of view with comfort; this done the arrangement was turned back, and the camera pushed up to it, so that a tube in front of it made a light-tight joint with the eyepiece of the microscope. The whole apparatus could be turned up on its stand and used in a vertical position, or to reduce vibration to a minimum it could be taken off its stand and clamped to the wall of the room. The camera was of such length that when focussing he could reach the fine adjustment screw of the microscope with his hand. He often worked with the homogeneous immersion powers of Zeiss and of Powell & Leland. Abbe's condenser was good for optical purposes, but, because it was fixed, he usually substituted another for it in photographic work. He found that in working with the exceptionally high powers used in photographing bacteria, that his exposures with the oxyhydrogen light were usually

two or three seconds, but with a paraffine light from two minutes to half an hour; he was well satisfied with the action of the oxyhydrogen limelight. The exposures were made by means of a shutter inside the camera. When using the one-twenty-fifth oil immersion objective, a low power was screwed to the microscope first, and a bright little spot of light formed on the lime by a small flame; the apparatus was then so adjusted that the small spot of light was accurately centred; the high power was then put in; some little time was then consumed in selecting the best part of the object to photograph, and much time was spent in focussing properly upon the ground-glass. He here exhibited a photograph of *anthrax*, the cause of the wool-sorters' disease, magnified 700 diameters, and an enlargement thereof upon Eastman's paper 4000 times the diameter of the object. As an illustration of the practical value of photo-micrography, he said that Dr. Lewis, of India, had photographed some organisms in the blood of bats, and the prints had chiefly enabled the organisms to be identified with some found in the common brown rat of this country. Photo-micrographs had also settled scientific disputes. Koch discovered that consumption is due to a little organism which has a beaded appearance like a rosary chain, and Koch stated that the little bright spots between the beads were the spores of this organism. He (Mr. Crookshank) had long hesitated to accept that view; he thought that they were dealing with a delicate rod with protoplasmic contents which had coagulated in the mounting, and so produced beads; he denied that the intervals between the little beads were spores; he exhibited a photograph of the organism of 700 diameters, also a print enlarged to 7000 diameters, and said that had any spores been present, those photographs would have made the fact obvious. He then exhibited a photograph of the *flagellum of Spirillum*; the object had been stained with gentian dye.

Dr. LINDSAY JOHNSON found that his own condensers gave two cones of light of different foci, and that that interfered with good photographic work. How did Mr. Crookshank avoid that?

Mr. CROOKSHANK used Swift's lantern condensers, and took care that the light from them filled the aperture of the Abbe's or other condenser of the microscope.

Mr. W. E. DEBENHAM said that a camera with swing back, with the back placed very much upon the swing while taking a photograph, gave a ready means of telling the difference between the chemical and visual focus of any objective.

Mr. J. A. HARRISON stated that with a plate placed at an angle in the pantoscopic camera, and a series of images at fixed distances taken thereon through the slit, the difference between the chemical and visual foci of an objective was readily determined.

Mr. CROOKSHANK thought that there was no plan so good as having the objective perfect, especially as they had to pay a long price for it, and to avoid mechanical corrections, especially in using the high powers of which he had spoken, to which the ordinary powers used in photo-micrography presented mere child's play in photographic work.

The PRESIDENT remarked that the photographing of bacteria was an achievement with which they were all pleased. He added that the last day for the receipt of pictures for the Exhibition was September 21, and that the *series* would be held on October 1. The judges were Messrs. W. Cobb, England, Donkin, Hollyer, Mendelssohn, and Davison. The jury for apparatus consisted of Messrs. Bolas, Addenbrooke, Cadet, and Trueman Wood.

Dr. DONKIN remarked that he had taken the liberty of inviting Herr P. Schlossman to exhibit numerous prints of the instantaneous photographs of animals taken by Ottomar Anschütz, of Lissa, who had received grants in aid of his work from the Prussian government.

A great number of the photographs were then exhibited, and included those of the flying stork, to which our special correspondent in Belgium invited attention last autumn.

The proceedings then closed.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, June 9, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. L. Medland presided.

The Chairman exhibited five negatives taken at Loughton.

The HON. SECRETARY stated that he had received a letter from Mr. Dunmore, of the Photographic Club, asking if the members of the Association would join it and other photographic societies in a photographic excursion to Watford on Jubilee Day, June 21.

The HON. SECRETARY announced that the Lord Provost of Glasgow would open the Photographic Convention to be held in that city early in July.

Mr. W. H. HARRISON asked whether all varieties of dextrine had the hygroscopic nature stated at the last meeting by Mr. Cowan. Dextrine was made in many different ways, and Mr. Charles Blackburn, of Didsbury, had exerted himself to get several commercial samples sent to him from manufacturers; most of the samples were of a light brownish yellow colour, and contained traces of acid which calico printers prefer to be present. The makers had sent him, also, a special specimen, labelled, "Low temperature dextrine," quite white and free from acid. No commercial samples of dextrine were chemically pure; pure dextrine, with all foreign matters separated by alcoholic treatment, being expensive and difficult to make, and, as yet, of no special use.

Mr. A. COWAN responded that, so far as his experience went, all varieties of dextrine were more or less hygroscopic. The yellower varieties had the stronger adhesive properties.

Mr. E. CLIFTON said that the old red postage stamps were backed with dextrine.

Mr. A. L. HENDERSON remarked that postage stamps are now backed with a mixture of gelatine and dextrine. The dextrine is put in to promote quicker drying.

Mr. T. BERRY stated that about fifteen years ago a firm with which he was connected mounted all their prints with dextrine, and the prints are now in as good condition as ever; yellow dextrine was used, dissolved in cold water. It was an advantage to be able to use a cold solution.

Mr. F. W. COX asked if gum tragacanth could be used for mounting prints. Mr. HENDERSON replied that it was difficult stuff to lay on. A prize of fifty guineas was once offered by some society for a good mountant, and the man who won it had recommended a mixture of gum tragacanth and gum arabic; the latter made the former more easy to use.

Mr. W. M. ASHMAN said that mouth-glue was a mixture of dextrine, gelatine and sugar, and when dissolved in water did well for mounting prints.

Mr. CLIFTON said that the London Paste Company were issuing some excellent stuff, quite common in America, and used largely by printers; it will keep any length of time, and can be diluted as desired. It is alleged to contain nothing which will injure photographs.

Mr. W. H. PRESTWICH asked the best way to mount prints in a book without producing cockling.

Mr. COWAN did not know how to do it without mounting the prints first, and making the leaves into a book afterwards.

Mr. CLIFTON said that very thick gum should be poured on to the back of the print, then distributed with the back of a knife, and the print then quickly pressed down upon the page before the paper had time to expand.

Mr. COX wished to know how to restore an Eastman's print which had yellowed.

Mr. A. PRINOLE thought that it would be difficult. Eastman's paper had a distinct cream colour of its own. He found that it was necessary to leave the prints long in the fixing bath; he never left them in it less than twenty minutes, and often left them in it for an hour.

Mr. J. B. B. WELLINGTON asked what would give a brown and aged look to prints.

Mr. CLIFTON replied that there was nothing better than coffee.

Mr. BERRY said that permanganate of potash was good.

Mr. PRINGLE had seen a platinum print of beautiful tone produced lately by Mr. H. P. Robinson.

Mr. CLIFTON stated that there is a regular trade known as "worm-eaters;" the men eat holes into wood with a fine drill, to give it an antique look; the earlier plan was to fire small shot into it.

The CHAIRMAN called attention to a description of an American camera which would take twenty-four plates without dark slides, and bring them up for exposure automatically when required; it only cost, lens and all, £3 15s. for the $3\frac{1}{2} \times 4\frac{1}{2}$ size.

Mr. CLIFTON remarked that practically it was Starnes's camera, but with a kind of revolving stereoscopic slide arrangement added.

Mr. PRESTWICH said that the meeting would be glad to hear that a member of that Association, Mr. Jarman, had just invented and put to work an excellent machine for driving tramcars by electricity.

The meeting then broke up.

CAMERA CLUB.

At a meeting on Thursday, June 9, Mr. W. H. Hyslop in the chair, an exhibition was given by Mr. T. M. Brownrigg of a set of lantern slides made from negatives taken during a recent tour in Switzerland and Italy.

Previous to the slides being shown the HON. SECRETARY drew attention to some pictures (to be seen on the Club walls) lent by Mr. Bolas, one a collotype print in a great variety of colours, and the others photographs by Mr. F. C. Beach of the "Celtic," showing the effects upon that vessel of her recent collision with the "Britannic."

Mr. Brownrigg's transparencies included some fine photographs of interiors and statuary taken under difficulties in the galleries at Rome and Florence, also pictures taken at Capri, Alpine scenery, and a humorous set in caricature of scenes from *Romeo and Juliet*. The gem of the collection was a picture representing sunset over a broad expanse of water.

The proceedings terminated with a vote of thanks to Mr. Brownrigg.

On Thursday, June 23, at nine o'clock, another exhibition of lantern slides will be given. Slides will be contributed by Messrs. J. Gale, J. B. B. Wellington, T. M. Brownrigg, C. B. Wright, and other members and friends.

The next Club excursion, to Marlow and neighbouring points upon the river, is fixed for Saturday, June 25.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Committee of this Association held a meeting on the 9th instant.

The minutes of the previous meeting having been read and confirmed, Messrs. H. Kuntzen, C. I. Cowie, F. J. Goede, W. Ingle, R. W. Goodden, T. Charters White, W. H. Walker, J. Jackson, H. E. Davis, J. Martin, G. Aspinall, E. Hooker, A. J. Wallace, J. G. Bryan, C. J. Parker, W. Ward, J. R. Jones, J. H. German, and A. Gandy, were elected members of the Association.

An application for assistance was then dealt with, and the sum of £6 granted the applicant.

The SECRETARY reported that Mr. J. Chester Jervis, winner of the £3 3s. prize, and Mr. Alfred Green, winner of the £1 Is. prize, given by the *Amateur Photographer*, had made donations to the Association of those amounts. Messrs. Perken, Son, & Rayment, and "S. B." had also contributed £1 Is. each to the funds.

Employers willing to assist the Committee in their work are desired to write to the Secretary for a supply of handbills for distribution amongst their employees.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held at Myddelton Hall, Islington, N., on Tuesday, June 7, Mr. J. Traill Taylor, President, in the chair, Messrs. J. T. Blonfield, H. Coppin, A. P. Higgins, J. Jackson, and W. H. Walker, were elected members of the Society.

A large number of views and groups taken at the excursions to Chiddingstone and Epping Forest were exhibited.

The PRESIDENT showed and explained the working of an American detective camera made by the Scovill Manufacturing Company of New York, having a very quick-acting lens made expressly for it by Wray, of London. This

camera was passed round among the members; its various actions were examined with much interest and gave rise to many inquiries. He also exhibited the Grimston shutter and another.

Mr. L. Medland showed a shutter which could be regulated to give exposures from one-fiftieth of a second.

In a short discussion upon the development of gelatino-bromide papers, it was stated that the secret of producing velvety black shadows in the pictures lay in the use of old ferrous oxalate developer. After use the developer should be placed in a bottle and exposed to sunlight, a little citric acid being added before again using.

Mr. A. MACKIE said that he had been frequently congratulated recently by non-photographic friends on the success now achieved of photography in natural colours. He had had to explain that we are, in that direction, very little in advance of the photographers of thirty years ago. The President would perhaps tell them something about the colouring processes of which they have heard so much lately.

Mr. TAYLOR then gave a detailed account of the Cellerier process of colouring photographs, so far as could be ascertained by him from an inspection of such as had been submitted to him for that purpose. It was, he said, merely a process of applying colours at the back of a transparent print, such as most of them had long been acquainted with.

In consequence of the third Tuesday of this month being the Jubilee day, the next meeting will be held on Friday, the 17th instant, when Mr. E. Dunmore will deliver a lecture on *Photography Past and Present*. Visitors are invited.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting of this Society was held at the Greyhound Hotel, Dulwich, on Wednesday, June 8.—Mr. F. E. Harding in the chair.

After the usual business, Mr. C. ESKELL read a paper on *Collotype Printing*. He described the use of the principal apparatus necessary, and explained his method of making collotypic prints. Mr. ESKELL gave simple formulae for substratum and sensitive coatings for the ground-glass plate, and stated that there need be no difficulty in any amateur working the process at a moderate cost; the whole of his outfit was obtained at a cost of about £3. Some very good examples of collotype printing executed by Mr. ESKELL were passed round.

At the next meeting of this Society, on Wednesday, June 22, at eight o'clock, members are invited to bring their photographic outfits ready for field work, for the purpose of comparing the merits and demerits of the various parts of their apparatus. Matters relating to field work generally will also be discussed.

Non-members are also invited to attend this meeting, bringing their apparatus with them.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

THE first excursion for the present session took place on the 9th instant, when sixteen members and friends proceeded by train to Coventry. Here the party were met by a break, and after a most enjoyable drive through beautiful country along one of the most famed, picturesque lanes in the country, the party arrived at Stoneleigh Abbey, the seat of Lord Leigh, an ancient and historical building. The party subsequently adjourned to the "Queen and Castle" Hotel, where lunch was provided. They then proceeded to Warwick Castle, where they were reinforced by several additions to their party. After about two hours spent in and about the Castle and grounds the apparatus were packed and the party drove to Kenilworth Station, where they embarked for home. In the aggregate sixty-seven plates were exposed, ranging in size from quarter-plate to 12×10 , resulting in an excellent average of successful pictures.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting of the above was held in the Free Public Library on Thursday evening, the 9th instant.—The President, Mr. J. A. Forrest, in the chair.

Mr. A. Pemberton was elected a member of the Association.

A circular was read from the Secretary of the Royal Meteorological Society, London, relative to photographing lightning flashes. None of the members had ever attempted this sort of work, but, the matter exciting some interest, it was felt that it should be tried the first opportunity. The photography of lightning does not present any particular difficulties. If a rapid plate and an ordinary rapid doublet with full aperture be left uncovered at night during a thunderstorm for a short time, flashes of lightning will, after development, be found in some cases to have impressed themselves upon the plate. The only difficulty is the uncertainty whether any particular flash will happen to have been in the field of view; this, however, can easily be obviated by using a suitable meter.

A number of specimens of ceramic photography from the potteries of Messrs. Sampson Bridgwood & Son, Leighton, Staffordshire, were exhibited by the Secretary, and much admired, especially so several which had been hand coloured. The firm print from members' own negatives, and their price is not excessive, considering the difficulty and indestructibility of the work.

After some conversation on the approaching Conference and the desirability of having a representative from the Association there, it was, on the resolution of Mr. P. LANGR, seconded by Mr. H. LUTTON, and agreed to, that the President be the one selected for the honour, the Association disbursing a part of his expenses.

A number of lenses of various sizes and price from the establishment of Messrs. Newton, Liverpool, were exhibited by Mr. W. P. Riley.

Mr. F. N. EATON had an exhibit, interesting to those photographers who study ways and means, of a number of developing trays made by himself from ordinary brown paper, put whilst wet on a wooden block of the required shape, and then when dry painted and varnished; their cost is almost *nil*, and to the tourist disliking travelling *impedimenta* they would be invaluable owing to their almost feather weight.

The chief attraction of the evening was a lantern exhibition, entitled

Glimpses of Picturesque Italy, by Mr. G. E. THOMPSON. To carry this out the windows had been blocked up with brown paper to keep out the sun, which was then shining in full vigour. This was Mr. Thompson's second visit to Italy with the camera, and resulted in a number of new places being brought before the Association that had not been seen before. Some three hundred views in all were taken, and the exhibition consisted of about half of these, and included Naples, Vesuvius, Capri, Amalfi, Venice, Milan, Pisa, &c. Many of them were of exceptional beauty and showed very high art in their conception. Mr. Thompson used quarter-plates throughout, which experience had taught him was the proper sized camera for a lengthened tour. His slides being all printed by contact, they showed every variety of colour—black to rich sienna brown, as most suited to each particular view; the latter tint, it was explained, being obtained by using the developer *cum grano salis*—Cowan's formula with a pinch of salt added. The lecturer enlivened the tour by an amusing and descriptive account of his travels in search of the picturesque, which was not the least enjoyable part of the evening's proceedings.

A very hearty vote of thanks to him and Mr. F. Evans for bringing and manipulating his lanterns brought the evening to a close at a late hour.

Correspondence.

Correspondents should never write on both sides of the paper.

JUNE MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE. — ON THE NON-SUCCESS OF THE DIFFERENT CONCOURS. — A PRIZE OF 1000 FRANCS OFFERED BY M. DAVANNE. — ENAMELLING PLATINUM PROOFS. — DEATH OF AN OLD AND ESTEEMED MEMBER. — AN INVITE FROM THE ENGLISH CONVENTION. — A NEW LENS. — TWO NEW APLANATIC LENSES BY M. MARTIN.

THE Photographic Society of France held their monthly meeting on Friday evening last, the 3rd instant, M. Peligot in the chair.

The Secretary informed the members that he was sorry to say that no one had come forward to dispute the prize of 2000 francs offered by "Le Ministre de l'Instruction Publique" for a progress in photographic lenses. The Committee proposed that the time should be prorogued until December, 1887.

The *concours* Gaillard, consisting of a prize of 500 francs for the best system of a film replacing glass, is under the same conditions—cannot find a laureate.

M. Bardy informed the Society that M. Davanne had offered a prize of 1000 francs to any one who can discover a sensitive surface for negatives so as to replace the gelatino-bromide of silver.

This *concours* is to be *international*.

M. Davanne, who is one of the old school, is grieved to see that at the present day no such beautiful, transparent negatives can be seen as in the old time of collodion and the silver bath; he therefore proposes this prize to incite the photographic genius of the numerous amateurs, as well as the profession, to discover a medium by which negatives can be obtained equal (or better, if possible) to the late collodion process. He asks: (1), Simplicity of preparation; (2), Sensibility of surface not unequal to the rapidity of the gelatino-bromide of silver process; (3), Solidity and firmness of surface.

These are the principal items that I was able to glean. No doubt the *concours* will be published ere long; I will then inform the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY. These notes will keep them on the alert, if peradventure some of them will try a struggle for fame in the scientific tournament which will take place.

A communication was sent in as to a manner to enamel platinum proofs. The author says it is necessary, first of all, to eliminate all the iron salt which may remain in the fibres of the paper by means of a feeble solution of hydrochloric acid, then wash thoroughly. The print when dry is immersed in a feeble solution of gelatine until it is completely impregnated; it can now be enamelled by any of the known processes, and will have a far better appearance than if this preliminary immersion was not accomplished.

The Society received the sad news of the death of M. Bayard, one of the founders of the Photographic Society of France. M. Chardon gave the members biographical notes of the services which this eminent *colleague* had done for the advancement of photographic knowledge.

The Secretary informed the Society that he had received a letter from Mr. Heinrich Trinks, of the Photographic Convention to be held at Glasgow, inviting a deputation from the Photographic Society of France. The President and the bureau named Professor Stebbing to represent them at the Convention; he thanked the President and the members for the great honour which had been proposed—at any other moment, said he, he would have gladly acquiesced, but the well-known fact of the catastrophe which had lately befallen him, together with the lawsuits pending against the Insurance Companies, would be an excuse for his declining. Other members were requested, but their ignorance of the English language, or the short time allowed, compelled them to retire.

M. Balbreck presented a landscape lens, consisting of three glasses cemented together; it appears that with this lens a larger diaphragm can be used than with the well-known single actinic view lens. M. Balagny spoke highly of it, and exhibited a negative (12 x 8) which he obtained by its aid.

M. Adolpho Martin, the well-known *savant*, presented two new lenses to the Society, the curves of which had been calculated by himself—in fact, had been made under his supervision. No doubt the Committee will make a report upon them.

Prof. E. STEBBING.

59, Rue des Batignolles, Paris, June 5, 1887.

PRETENDED PHOTOGRAPHY IN NATURAL COLOURS.

To the Editors.

GENTLEMEN,—The unfounded nature of the pretensions of the Cellierier Syndicate to "Photography in Natural Colours" having been exposed, it might seem unnecessary to discuss the matter further but for the suggestion that their productions might be entitled to be called "Photographs in Colours," and that such a name would not be misleading. In reply to this suggestion I submit, first, that photographs coloured by the Cellierier or any similar process of hand painting are *not* "photographs in colours," and, second, that the expression photograph in colours is, and always has been, understood by the public to mean that the colours have been produced by photography and not by the painter; third, that therefore to call the Cellierier or any similar productions "photographs in colours" is just as much a misstatement and just as much calculated to mislead the public as the title they put forward, "Photography in Natural Colours."

1. In the Cellierier process the photograph is an ordinary autotype or carbon transparency. The application of the colours is a separate process, depending upon the judgment of the painter in selecting the colours and his skill in applying them to the places where he desires to produce his effects. The result is a coloured photograph, and no more a photograph in colours than a hand painted lithograph is a chromo-lithograph.

2. I suppose that there are few photographers of any lengthened experience to whom the remark has not been occasionally addressed by one of the public, "I suppose the next thing will be that you will be able to take photographs in colours." Whatever the reply may have been, the idea existing in the minds of both speaker and photographer has been that photographs in colours means pictures in which the monochrome of actual photography shall be substituted by a coloured image, not that a monochrome image is to be coloured by a painter, and this idea is a perfectly just one.

It happened some time ago (perhaps a year and a half or two years since) that a gentleman of my acquaintance, who had been connected with public companies, called upon me to ask my opinion respecting a process in which he thought of interesting himself, and which had been introduced to him as a process of taking photographs in natural colours. He obtained and sent me the specification (Cellierier's), and at our next interview I gave him my opinion, which is, and was, that to introduce such a process as photography in colours would be quite as unjustifiable as to supply cotton under the name of silk, or brass as gold. My friend, of course, replied that he would have nothing to do with such an affair. The process has, however, found investors or supporters who have not scrupled to bring it out with the misrepresentation that has justly been condemned in the photographic press.

"It must be true, it's in the papers," is an old saying which represents the feeling engendered in the public mind by statements, some quite recent, in journals claiming to be leading organs of public opinion, as to the new era said to be now instituted in photography by the discovery of processes for producing photographs in natural colours. It is not easy to convince the public of the fact that these statements, however they may conduce to the pecuniary interest of certain people, have not a vestige of truth in them. To the honour of the *Standard* among leading newspapers, it may be said that it is not amenable to the influences which can procure the insertion of paragraphs of the nature referred to. Will not the proprietary of other leading newspapers see the desirability of sifting such matters so far as their own columns are concerned, and of taking means to prevent for the future their influence being used for the purpose of disseminating misrepresentation for the benefit of commercial speculators?—I am, yours, &c.,

W. E. DEBENHAM.

To the Editors.

GENTLEMEN,—In your article last week on "Photography in Natural Colours" you point out that the title is "misleading and therefore reprehensible," and you suggest that there is no objection to the title of "photographs in colours." I really think if the public is likely to be misled by the former, it will be equally so by the latter. The only title that would not be misleading surely is "process for colouring photographs."—I am, yours, &c.,

A. COWAN.

Photographic Club, June 15, 1887.

To the Editors.

GENTLEMEN,—Again we are brought face to face with the alleged fact that photography or photographs in colours is *un fait accompli*. It would be interesting if some statistician would inform us the different periods

at which this is thrust upon the too credulous British public. As photography progresses so does the number of the so-called processes for the production of photographs in natural colours—in fact, in a far greater ratio. It is a growing shame that these Companies, and others, are allowed to advertise the fact that they are now able to produce *photographs* in natural colours. I mention the word photograph as you appear to think that it is not so misleading as “photography.” I really cannot see the difference; the one is as misleading as the other. A photograph I understand to mean the image, no matter what may support the image; and photographs in colour would infer that the image itself was produced chemically in colours from the object copied; and it is this which the present processes before the public are meant to convey, but in reality is not so. Not only do the general public suffer, but I have reason to believe that professional photographers are suffering from the results of this so-called colour photography, which is spreading far and wide. Sitters are waiting to see and hear more about this new discovery before having their portraits taken in the ordinary way. I imagine this to be the cause why many photographers with whom I have come in contact have had so few sitters as compared with formerly.—I am, yours, &c.,

J. B. B. WELLINGTON.

38, *Fellows-road, South Hampstead, N.W., June 16, 1887.*

[From a re-perusal of what we wrote last week and the correspondence arising therefrom, we perceive that the reconstructed title of the Syndicate, “Photographs in Colour,” is not sufficiently definite. We held it for the moment as being synonymous with *Coloured photographs*, which term not being capable of ambiguity we now substitute for that previously given, so far as concerns our own expression of opinion.—EDS.]

MEDALS.

To the EDITORS.

GENTLEMEN,—The letter of “An Exhibitor” is an interesting contribution. I believe medals might be dispensed with at exhibitions if detailed criticism of pictures in the journals could be guaranteed. A number of persons would rather be noticed unfavourably (but kindly) than not noticed at all.

“An Exhibitor’s” eighth correspondent, however, makes some remarks evidently referring to the Newcastle Society, and as the Hon. Secretary thereof, I would like to notice his final sentence, that about good management and confidence. His remarks, vague and unsatisfactory regarding my own work, I can pass over, merely noting that all my awards have been obtained in open, and, in most cases, keen competition. I should not personally value a “walk over,” but I can sympathise with a disappointed exhibitor, having often enough experienced similar sensations. I imagine this eighth correspondent, who talks of “our Society,” must be a member of the Council; if so, he lacks sincerity, or he would have turned up at our last meeting, when he might have done great service. Societies are managed by their Councils, elected annually by the members. If a member wishes to nominate certain officers, he can do so by letter to the Secretary, if he does not like to do so in open meeting. I think a change every year would be very desirable, but it is extremely difficult to get this carried out. I have now and then met with members like No. 8, and have endeavoured, sometimes with success, to get him on the Council in order to give him a chance; but when the opportunity has occurred, when some new departure has been desirable, the member has been conspicuous by his absence.

In conclusion, your readers may bear this in mind, that “Societies are very much what the members like to make them.”—I am, yours, &c.,

16, *New Bridge-street, Newcastle-on-Tyne, June 12.*

J. PIKE.

CAMERA BACKS AND OTHER MATTERS.

To the EDITORS.

GENTLEMEN,—I must apologise to Mr. Poirin for my oversight as to his camera back, which I had quite forgotten, though it is, as he says, in the 1885 ALMANAC, and I must have seen it when I made the camera which I sent for your inspection, whether I drew the idea from it, or, as I believe, had previously hit upon it myself. In any case, by universal custom, priority is decided by publication, and he must have the credit of having effectually barred any valid patent for a back with a closed bag. I should, perhaps, point out in the same connection, that the plan of pushing out the plates by the action of the sliding shutter had also been previously applied by Mr. Samuels to a repeating back with two compartments, so all I could in any case claim is the combination of the two ideas, which in my experience makes a very useful form of back with the special advantage that it cannot expose the same plate twice.

May I venture to add to your practical remarks on the use of gas in a recent issue, the suggestion that for all connections which do not require frequent moving, common “compo” gas pipe is both a cheap and convenient material, and may be easily joined with short lengths of indiarubber as you suggest for glass?

With reference to the inaccurate measures mentioned by a recent correspondent, a pharmaceutical friend has pointed out that all measures used in dispensing must be examined and marked by a Government

inspector, and are thus guaranteed approximately accurate. I have such a two ounce measure before me as I write, from the York Glass Works, and marked V.R. Y.K. It is tall and slender, and the first two drachms are divided into minims, which is very convenient for mixing concentrated developers. The price is about 1s. 6d.

Mr. Drinkwater’s excellent paper on pyrogallol published in your last, was one of a sort of which we have only too few, and his suggestion as to the source of modern pyro was specially interesting. I should like, however, to understand exactly what he meant by calling sulphurous acid a restrainer. Of course excess of free sulphurous acid or acid sulphite in the pyro developer is not only a restrainer, but, like every other acid, completely stops development. But free acid and sulphites cannot exist in presence of free ammonia, and neutral sulphites, whether of potash, soda, or ammonia, are not known to have any restraining action. No doubt, theoretically, some change is constantly taking place in dissolved pyro, but I have not found either practical deterioration or restraining action from solutions preserved many months with acid potash sulphite, so long as the requisite quantity of ammonia was used to neutralise the free acid, while for convenience and accuracy of measurement the solution has greatly the advantage over dry pyro.—I am, yours, &c.,

HENRY R. PROCTER.

Tynemouth, June 13, 1887.

SMALL PLATES IN LARGE SLIDES.

To the EDITORS.

GENTLEMEN,—It is just possible you may think my experience worth publishing in the following matter:—I had been much troubled by the difficulty of always getting half-plates to fit into carriers for use in a whole-plate camera. I cut two spoiled negatives to the exact size required to fill up a whole-plate dark slide with a half-plate, put the two in together, and by means of the sliding front, shift the lens in focussing so as to cover quite sharply the part of the slide where the plate is, and find the plan works admirably.—I am, yours, &c.,

R. C. MACLEOD.

Bolney Vicarage, Hayward’s Heath, June 8, 1887.

DETERMINING THE TRUE FOCUS OF LENSES.

To the EDITORS.

GENTLEMEN,—Will you permit me to call attention to two errors in Mr. Lyonel Clark’s paper on *The Focus of Lenses*, as given in your issue of the 10th instant?

Equation (1) should be—

$$\frac{1}{B} + \frac{1}{A} = \frac{1}{F}$$

and in the second line of the following paragraph “A = 8” should read A = ∞.

I need make no apology, I think, to Mr. Clark for pointing out these errors as they are evidently merely clerical, and as such would not need correcting except for the sake of those of your readers who have not much confidence in their own knowledge of optics.

There is another method—also recently given by Mr. Traill Taylor—for finding the focus of a lens which Mr. Clark does not recount, and which I have found preferable to, because simpler than, the pinhole method. It is as follows:—With a pencil draw on the focussing screen two vertical lines; these may be placed anywhere, but should, for the sake of accuracy of the determination, especially in the case of long-focus lenses, be as far apart as possible without getting too close to the sides of the screen. Then, placing the camera on a board or a piece of paper laid on a table, focus some distant object—a flagstaff, chimney, or vertical corner of a building is convenient—on one of these lines and draw a line along one edge of the baseboard on the paper beneath it. Now swing the camera till the same object is focussed on the other vertical line on the screen, and draw another line along the same edge of the baseboard. If now, with these two lines as sides, an isosceles triangle be completed, having its base equal to the distance between the two vertical lines on the screen, the length from the vertex of this triangle to the middle of its base is the true focus of the lens.

This method requires but one object—and it is not always easy to find two suitable objects which can be got into the field of view with any lens—there are no awkward measurements to be made in the camera, such as from pinhole to screen, the small amount of geometrical construction requisite is conducted with the convenience of an improvised drawing board, and no additional apparatus has to be fitted to the camera, so that it is, I think, in practice the simplest of any yet given, and withal it is theoretically correct.

Good things bear repetition, so, although it is not long since this method was fully explained by Mr. Taylor I have ventured to recall it while, by reason of Mr. Clark’s paper, the subject is fresh in our minds.

Mr. Clark’s view meter modification of the pinhole method is not, I fear, calculated to give very accurate results, as I have always found it very difficult to measure with any degree of certainty the distance of any object from the eye.—I am, yours, &c.,

Z. H. KINODON.

Old Charlton, Kent, June 15, 1887.

NEWTON'S RINGS.

To the Editors.

GENTLEMEN,—Can you or any of your readers inform me if the Newton's Rings, which are formed between the glass of the printing frame and that of the negative, are capable of leaving an impression on the prepared paper in the frame?

The colours produced by transmission being so much fainter than those by reflection, I should not have expected it; however, I have frequently found markings in the sky corresponding in position to rings seen by reflection.

—I am, yours, &c.,
Bristol, June 9, 1887.

M. D.

[Newton's rings do give a photographic impression, as we have proved many times.—Eds.]

THE RIGHT TO THE NEGATIVE.

To the Editors.

GENTLEMEN,—Photographers do not claim the negative as a right, nor do they allow that right to be claimed by the sitters. It has been the custom for photographers to preserve and retain the portrait negative, not for their own benefit only but for the benefit of their clients also, from whom an expressed wish that it be no longer retained would receive immediate attention.

I am an amateur of the old wet date, and this has been my experience of my professional friends, with some of whom I have been long intimate. They are good, generous men—men of strict honour.

Among professors of the art I find, however, that there are some who advance this foolish claim. To them I would say—Give the reasons for your claim in the numbered form 1, 2, 3, 4, &c., and by this means silence your opponents, or give them work to confute the statements advanced for the claim.

One correspondent writes, "That the sitter orders one dozen cabinet portraits with which he is supplied." "These were all he wanted and all he was promised;" an excellent reason for the operator's claim to the negative. Allow me to add that for these dozen of copies the photographer was paid 25s.; this sum was all he asked for, and he was promised no more.

What now about the negative? The glass and the film are undoubtedly the photographer's, and the impressed portrait on the film belongs as undoubtedly to the sitter—a joint partnership. A very simple arrangement or understanding between photographer and sitter would settle the matter, but without an arrangement or understanding honesty does not give the claim to the photographer.

The remarks of A. L. Steavenson, of Durham, I have noted. In him my fellow citizen has found another illustration of the truth of his statement that some minds are incapable of judging moral right and moral wrong.

"Use and Wont" has upset me—the word Edinburgh has caused a disagreeable moisture in the corners of my eyes.—I am, yours, &c.,

The Engineering Works, South-street, Newcastle-on-Tyne, MAC.

June 13, 1887.

To the Editors.

GENTLEMEN,—I am not a professional photographer, and don't expect to be, but I am certainly of opinion that unless a sitter agrees to buy the negative as a separate article, the photographer has a right to keep it, so long as he does not trespass on his client's rights by issuing copies from it without permission. Surely no one having a correct knowledge of the skill and labour entailed in the production of a good portrait negative can argue that it is amply paid for out of the profit on a dozen or so of copies, even though a little extra charge is made for the first lot. An adult customer has almost invariably at least two negatives taken, and as for children and babies—well, the average experience is too harrowing to relate. I have frequently walked into studios, when the artist has been engaged on a lively young specimen, and patiently waited in the anteroom listening to the ridiculous cooing, whistling, horse-driving sounds, and urgent appeals from the operator to his sitter (or rather kicker) to "watch for dickie-bird coming," until my mind has wandered to a certain placard exhibited by a German photographer for the enlightenment of his English visitors, "Babies instantly executed here;" and I have thought what a blessing it would be if the creature could be executed for a few seconds to give the exasperated operator a chance of uncapping his lens without spoiling half a dozen of his "baby plates," to say nothing of his time, which, of course, is no object, though it would be to a mechanic at so much per hour.

Then came the retouching, printing, and sending of proofs, booking, &c., all of which are mere trifles compared with the handsome profit on the finished prints.

Apart from this, I fail to see the public grievance caused by the retention of the negative. I can see plainly that the surrender of it is likely to be prejudicial to the photographer, and in many cases even to the sitter. I have known several instances where it has been bought and

willingly paid for, but a few years, or even only a few months after, it has turned up so scratched, broken or otherwise damaged, on the decease of the person represented, that the only decent copy obtainable has been a somewhat costly one worked up in colours, whereas the photographer would have taken more care of it. As regards the other point, there is no doubt the photographer relies to some extent on repeat orders; otherwise it would be open to any one to get half a dozen or a dozen prints, demand the negative, send it to a professional printer, and get any quantity of, say, unmounted cabinet prints at about 4d. each, and mount them at home. This would be very nice for a bazaar committee, for instance, who wished to make money by selling portraits of a pet local celebrity, and of course quite fair to the painstaking professional who supplied the cliché.

What shall he do in the case of a group? Every member of that group has a perfect right to his own part of the negative. Of course it would have to be nicely cut up with a diamond, and woe betide him if in cutting out a front row he encroaches upon the rights of a back-row member. I am afraid some of the heads would get legs and arms that did not belong to them, while others would be mere Fatimas, or "bodyless beauties."

Next time I have any lithographing done, I shall demand the stone; it will only weigh thirty or forty pounds, and the lithographer has no right to keep any impression that refers only to myself. Anyway, if I cannot lug the stone away, I will have the transfer, as it is paid for in the price.—I am, yours, &c.,

A. A. PEARSON.

Leeds, June 15, 1887.

To the Editors.

GENTLEMEN,—The lady amateur, "Millie's" pathetic appeal against her negative (not herself) being "labelled, registered, and stored to criminal bondage" (poor negative!), will in itself almost turn the stony hearts of the profession to her way of thinking. Future orders for one dozen cartes will be accompanied by the negative, which in ninety-nine cases the client would rather not have, preferring it being carefully and tenderly cared for by the photographer, knowing in years to come, when memories become valuable, they can with certain have a further supply.

"Millie" having asked herself why the negative should be retained, "for which they have been handsomely paid" (not always), could with advantage further ask herself, Was the order for pictures only, or pictures and negative? Did she ever see a photographer's price list mention anything other than "cartes-de-visite and cabinets" at so much per dozen? I consider the negative as much the property of the photographer as his lens that threw the image. "Millie" further considers and suggests a Parliamentary Debating Society shall fight the battle. Should they decide amongst themselves by a large majority on division against the photographic artist then "after copies" business is doomed. We shall have an army of gentlemen willing to print for practice and a small consideration. People will walk about with their negatives as many do with their own last in search of the cheapest printer or bootmaker.

Why "Millie" should designate sitters as "ladies" and "gentlemen," photographers, "man" and "men," "of nothing further known than their professional names," &c., is best known to herself. To such "men" she should not again sit. Far better buy her own plates and get a "gentleman" amateur to make negatives for her. How nice this would be.—I am, yours, &c.,

T. COAN.

50, Cumming-street, Pentonville, N.

Exchange Column.

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

Required, a single-view lens by good maker, for plate 10x8, in exchange for cabinet burnisher, nearly new.—Address, A. FERRARI, Photographer, Wood-street, High Barnet.

Will exchange carved walnut show case, cost over £20, for portable 12x10 camera and double dark slides, and tripod stand for same.—Address, CAMPBELL, 4, Mulgrave-road, Sutton, Surrey.

Will exchange a good eleven-inch bar burnisher (new and never been used) for a good rectilinear lens. Difference adjusted.—Address, CHAS. WM. APPLEBAID, Photographic Engineer, Maperton-road, Bradford.

I will exchange a fine gilt show frame (takes twelve cartes and six cabinets), with protecting outer frame, in good condition, for cornet, banjo, mandoline, zither, or old double-bass.—Address, RAYMENT, Aldermaston, Egham.

Wanted, quarter or half wet plate repeating back camera, also Victoria camera and lenses. Exchange, plain cloth background, outdoor ditto, 12x10 single lens, lectern, &c.—Address, PHOTOGRAPHIC COMPANY, King-street, Weymouth.

A Ross' quarter-plate portrait lens, Vogel's wide-angle 12x10, Dallmeyer's 2s, and whole-plate French lens. Any of the above in exchange for a wet-plate camera to take two quarter-plates on half-plate in two moves, with two dark slides.—Address, J. SALT, 14, New Arade, Sunderland.

Wanted, a 12x10 bellows camera, lens, and stand, quarter or half-plate Lancaster's International or other light set, also a good magic lantern. Offered, astronomical telescope, gold watch, stereoscopic camera and lenses, and other photographic goods in exchange.—Address, A. BUCKNALL, 7, Bellevue, Clifton, Bristol.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED:—

John Stuart, 120, Buchanan-street, Glasgow.—Two photographs of Rev. J. McGregor.

A. B.—To preserve the gelatine add a little alcohol or thymol.

A. HOPKINS AND J. PARKINSON.—Inadmissible. See conditions.

A. T. D. BERRINGTON.—If you ever come to London we shall have pleasure in showing you the camera.

G. S. T.—It is possible with an orthochromatic plate to photograph the beacon fire. The exposure must depend upon the aperture of the lens employed.

HALF PLATE, No. 2.—No hope of making a really good negative of your over exposed one. Make a transparency from it, and from that make another and more intense negative.

S. S. S.—1. A shock after exposure is completed will not affect the sharpness. —2. You may call your studio the Royal, but you must not use the royal arms.—3. Send the lens and we will examine it.

R. C. MACLEOD.—1. If the solution has become yellow it is useless, but the zinc treatment will restore it to working order if applied as recommended by the writer of the article.—2. The plan is not applicable to pyrogallic developer.

B. O.—Saxe paper may be obtained of any of the dealers in photographic materials. If they do not keep it in stock they will procure it for you. They will quote you a price. Unless we knew the purpose for which it is to be used it is impossible to say if it will require any preparation before coating.

W. F. TIMPERLEY.—If you act as your own patent agent the cost of the provisional protection for nine months will be one pound. Upon a further payment of three pounds within the nine months you will secure a patent for four years. One patent will secure all the parts of the invention. Registration is useless.

A.—The paper should be sensitised on a plain solution of nitrate of silver. The strength must depend upon the amount of chloride with which the albumen is salted. Unless we knew this we could not say the strength required. Your best plan will be to sensitise three sheets, one on a forty, one on a fifty, and the third on a sixty-grain bath, and see which produces the best results when printed.

TOM writes as follows: "Say I have an object sixteen feet by less in width to photograph on—well, say a whole-plate, using a lens thirteen inches equivalent focus, is there a rule to tell me the number of feet distance required between the lens and the object? If there is, kindly explain."—If our correspondent will refer to the Table of Enlargement and Reduction given in the ALMANAC he will obtain what he requires.

INQUIER writes: "I have had the misfortune to leave several printing frames out of doors in a drenching rain; the consequence is the wet got to the negatives and has produced silver stains, although the negatives were varnished; they are now quite worthless. Can you tell me what to do with them, for they are valuable, and I do not want to lose them if possible?"—We fear the case is hopeless. If a weak solution of cyanide of potassium will not remove the stains the negatives may be considered as permanently ruined.

G. F. ADCOCK says: "I wish to enlarge with eight-inch condenser from half-plate to 10x8, that is, to get an enlarged negative on a dry plate to print from. Can you give me any idea of the exposure necessary, also the development? My lantern is one of three wicks."—Without knowing the actinic power of the light or the sensitiveness of the plates it is impossible to give any idea of the exposure required. The best plan will be to make one or two trial exposures on small plates of the same sensibility. The ordinary developer used for negatives will do quite well.

W. T. Z. writes: "Will you kindly give me, in your 'Answers to Correspondents,' a formula for getting cold grey tones on ready-sensitised paper? The paper I have been using is —'s sensitised paper, and I can get nothing but brown tones with it, which I very much object to. The bath I have been using has been the lime bath or acetate."—As a rule, the ready-sensitised papers are not well adapted for cold grey tones. The best plan of obtaining them will be for our correspondent to sensitise the paper for himself, using a moderately strong bath for the purpose; then, with the lime bath or the carbonate of soda bath, no difficulty will be experienced in securing cold tones.

W. E. METHVEN says: "I see in this week's JOURNAL a reply to 'W. A. C.' with reference to snail marks on gelatine plates. You say there is no way to get rid of these when they exist, as they are due to the manufacture. Of this I am aware. I have made batch after batch of plates and cannot get rid of these markings, which are always more or less strongly shown. They are particularly obnoxious in portraiture with a plain background. Can you tell me to what these snail marks are due? I have tried everything in reason in the way of filtration. Is it due to any particular make of gelatine? I have spoken to several plate makers, professional and amateur; some did not even know of their existence, others suggested different expedients as remedy, but all to no purpose. Can you enlighten me through your 'Answers to Correspondents?'"—Some samples of gelatine are more prone to these markings than others. We advise our correspondent to try a sample from another source than that from which he has drawn his previous supplies.

FIXATION says: "I should like to know the cause of spots on enclosed prints. They have been, to my way of thinking, most carefully manipulated, the following being the process:—After exposure they were washed in five or six changes of water, in the first two of which they did not remain more than a minute or two, and they were whirled round and round the dish all the time, the total time for all these washings being about thirty minutes. After this they were toned, some in the carbonate bath and some in the tungstate bath, accurately prepared from the standard formulæ. When toned (and it was at this point that most of the spots were first discernible) they were again washed for a few minutes in two or three changes of water, and then fixed in hypo, four ounces to the pint of water, just enough liquid ammonia being added to be easily smelled, that is, to make the solution smell of it. The amount of the latter might be in excess of that quantity usually recommended, but there was not more than half a teaspoonful to the pint, if that much. In the fixing bath they were kept for fifteen minutes, the dish being rocked from side to side all the time, and the greatest care taken that no two should stick together. Upon their removal from this bath they were washed for twenty-four hours in several changes of water; for the first quarter of an hour they were kept in constant motion, and were not allowed to stick together at all. I have never noticed this defect when using the acetate bath nor before I purchased the sample of gold chloride I am now using, and which is the best, or, rather, the dearest. An answer in the JOURNAL will greatly oblige."—The spots have all the appearance of being caused by air-bubbles sticking to them while in the fixing bath, but if they make their appearance before they are fixed it is clear this is not the cause; therefore the only suggestion we can make is that the spots arise from air-bells while in the toning bath. We do not think the chloride of gold is at fault.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—On Tuesday, June 21, this Society will take part in the London Photographic Societies' Jubilee Excursion to Watford. Train: Euston, thirty-five minutes past ten; Willesden, fifty-four minutes past ten.

RECEIVED.—*Pictures from Life in Field and Fen*, by P. H. Emerson, B.A., M.B., will be noticed next week. Also received Price Lists of the various manufactures of Morgan & Kidd; Catalogues of James Swift & Son, and of Joseph Levi & Co., opticians.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, June 22, 1887, will be *Aids to Exposure*. Saturday outing at Waltham. Train from Liverpool-street at fifteen minutes past two. June 21, amalgamated Club and Society outing at Watford. Train from Euston at ten minutes past ten.

FROM M. Paul Nadar, of Paris, we have received an interesting photograph of the ruins of the Opéra Comique, which was taken immediately after the conflagration. The picture is one of two hundred which Mr. Nadar has obtained in a few hours with the ingenious Eastman-Walker roll holder, using their films.

NORTH SURREY.—At the next meeting of the North Surrey Photographic Society special novelties are to be introduced. Members and non-members are invited to bring their photographic outfits ready for field work, for the purpose of comparing and discussing the merits and demerits of their apparatus. The meeting will be held at the Greyhound Hotel, Dulwich, on Wednesday, June 22, at eight p.m.

* * * Owing to pressure on our columns we have been compelled to hold over several articles, including an account of Richmond's Instantaneous Shutter.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1416. VOL. XXXIV.—JUNE 24, 1887.

COLLODION *VERSUS* GELATINE.

At the meeting of the Photographic Society of France, as will be seen from our French correspondent's communication last week, M. Davanne has offered a prize of a thousand francs to any one who will devise a method of producing "sensitive surfaces" to replace gelatino-bromide of silver and which will at the same time yield results equal to collodion with the silver bath. Full details of the conditions are not yet published, but the principal ones are understood to be—"first, simplicity of preparation; second, sensibility of surface not unequal to the rapidity of the gelatino-bromide process; third, solidity of surface." M. Davanne laments to see that at the present time no such beautiful, clear, transparent negatives are being taken as used to be produced by the wet collodion process. Hence his liberal offer of a prize for another and better process.

Is it a fact, however, that the gelatino-bromide process does not yield, or is not capable of yielding, results quite equal to collodion? Some we know will answer emphatically "No!" while others will as positively say "Yes!" That there is a wide difference in the appearance of the negatives by the two processes cannot be denied, but the real test of the quality of any negative is the excellence of the print it will yield. Cannot as good impressions be obtained from gelatino-bromide negatives as from collodion? If not, it is clear that photography has degenerated, to some extent at least, since the general employment of dry plates in place of wet; certainly, in the opinion of the giver of the prize, it has in France. We know many photographers of the old school in this country who, like M. Davanne, still sigh for the rich, brilliant negatives of old, with their clear shadows and vigorous lights, which, they say, cannot be obtained with dry plates. On the other hand, we are aware that a large majority of modern artists, whose experience with the wet process is but limited, or who, perhaps, never worked it at all, declare that far better negatives are now being made with dry plates than were possible with wet. Therefore it is clear that negatives by the two processes should be judged by a different standard. And why should they not?

At one time it was not unusual to see in advertisements that certain makes of plates would render negatives equal to wet collodion; one rarely sees such announcements now. It is quite within the bounds of possibility, if the collodion process were only now being introduced as a new one, that the claim might be made for it that it would produce as good results as gelatine. Be that as it may, it is clear that the two processes should not be compared from the same standpoint.

A good collodion negative, when placed upon white paper, has perfectly clear glass for the deepest shadows, with the lights more or less intense according to the density of the image,

whereas the shadows in the usual run of gelatine negatives when similarly tested are seen to be, to a certain extent, veiled. What, it may be here mentioned, might be considered clear shadows in a gelatine image would be looked upon as fogged in a collodion one. That veiled shadows were produced with bath plates, and perfectly clear ones are obtainable with dry ones, cannot be denied, but in either case it was, and is, the exception and not the rule.

It is said that gelatine negatives—we are now referring to portraiture—require far more retouching than did collodion, before they can be placed in the hands of the printer. Hence they become more costly. Much greater importance, as most know, is now attached to retouching than formerly, but it is a question whether this arises so much from the inferiority of the negatives themselves as from the higher finish demanded by the sitters. However, there can be little doubt that more time is now expended upon working up gelatine negatives than was bestowed upon those made with collodion.

Whatever may be the opinion amongst the most conservative of professional photographers, we find, as a matter of fact, that they, as a rule, have abandoned collodion for both portrait and landscape work. Are we to assume that they have done this simply on account of the convenience of working and the exalted sensitiveness of the plates, knowing all the time that the quality of their work would prove inferior in the end? We think not. Our leading artists, whether in portraits or landscapes, produce as good printing negatives on gelatine as they did on collodion, while a large majority of those who only produced mediocre results with wet plates are now doing far better work with dry—a circumstance scarcely to be wondered at. With amateurs, too, the same holds good. The veterans in collodion have all adopted gelatine, and are securing equally as good results by the change with a far greater variety of them.

The gelatino-bromide and the wet collodion processes each have their strong and their weak points, as every one is fully aware, and if any new process can be devised which will combine all the good qualities of each—while eliminating the bad ones—a great advance in photography will be secured. Therefore M. Davanne is to be commended for his liberality in offering a prize for what many photographers, not only in France but everywhere else, have long been sighing for, namely, a dry process which will yield negatives with gelatine rapidity and collodion qualities. Let us hope that such a process will in the end be forthcoming.

CYCLING is now so much a part of outdoor photographic work that the velocipedist almost deserves a corner for himself. The tricycle is naturally the favourite, though we have seen not a few pair-wheels

evidently equipped for action photographic; but, whichever is selected, the one great question to the amateur who, for dark room purposes, has, perhaps, robbed his premises of the only spare corner the powers that he would consent to, is, "Where is the cycle to be put?" We are pleased to find that with a knowledge of the shifts to which the owners of the wheeled horse are so often put, a well-known firm has devised a portable house or shed ready for instant erection in any place provided that a bare wall and a vacant space a few feet square be available.

THE *Conversazione* of the Royal Society, held on the 8th instant, was a great success, and amongst not the least attractive of the exhibits, those belonging to the department of photography must undoubtedly be placed. Captain Ahney's mode of illustrating the production of sunset colours by atmospheric absorption, though not exactly photographic, is yet interesting to photographers from the fact of the familiar "hypo" being the main agent in the experiment. A solution of this salt is made, sulphuric acid added, and a strong light sent through the liquid. A gradual precipitation of sulphur takes place, and according to the size of the particles so is the light of the emergent beam modified. The size of these particles is such as to scatter the rays from the blue end of the spectrum from the light received by the vessel, and to permit mainly the red ones only to pass through.

THE usual "Visitation" at Greenwich took place a little while ago, and as will be perceived from our report of the visitation in our issue for last week, a large share of the interest attaching to the report just issued centres upon matters photographic.

LAST year ought to be looked upon as above the average from a photographic standpoint, at any rate judging by the amount of bright sunshine; for we learn that the indications of Campbell's recorder gave a number of hours above the average of the last nine years, the sun having been brightly shining during twelve hundred and twenty-eight hours, which gave a ratio of twenty-seven hours' sunlight for every hundred hours the sun was above the horizon.

THE question of measurements above adverted to is one of very great importance, and it was discussed with some amount of heat at the last meeting of the Royal Astronomical Society. Professor Pritchard read a paper on the parallax of a certain star, as measured from photographs, three hundred and thirty photographs having been taken, and thirty thousand measurements made from the star images upon them. Mr. Ranyard took exception to the possibility of such exactitude being obtained from photographs, although he withdrew a previous description he had previously given of a magnified star image as like a heap of shingle. The opinion of the meeting seemed to be in favour of the accuracy of the measurements that could be made from photographic images.

AT the same meeting, photographs of the solar corona taken during an eclipse formed the subject of an interesting discussion, and they were utilised in an argument against a certain theory in connection with the corona, some of the later eclipse photographs being stated to combat Professor Hastings's theory that the corona may be accounted for as a diffraction phenomenon.

IN the brief study of the alkaline carbonates which we wrote a few weeks ago, we naturally omitted many points interesting from a chemical or a photographic standpoint, but amongst the impurities to be found with the sodium salt we may mention that, according to Herr E. Mylius, "hypo" is sometimes met with, an impurity which we need scarcely point out might lead to some confusion in developing operations.

IN a recent issue of *Comptes Rendus* there are a number of interesting analytical remarks upon the behaviour of the sulphites which were the means of assisting in devising an easy method of qualitative analysis. Thus, sulphite of soda solution is strongly alkaline to litmus paper, yet upon adding to it barium chloride, which

does not change the colour of litmus, the liquid is seen to be perfectly neutral to test paper, sulphite of barytes and chloride of the alkali being produced. If an alkaline bisulphite be treated with the above chloride the sulphite of the alkali is again produced, and the remainder of the sulphurous acid is set free in the solution. "Hence," says the writer, M. A. Villiers, "it results that if we treat with chloride of barium a mixture of an alkaline sulphite and bisulphite, a mixture which is distinctly alkaline to test paper even when the proportion of neutral sulphite is small, the solution becomes acid after the addition of the chloride of barium."

Now, although the price of sulphite of soda is above that of hypo, it is still a fact that a proportion of the former, larger or smaller according to circumstances, may be found in the latter salt. The above very interesting reactions show how the presence of this foreign salt may be shown. If the mixture of salts be alkaline it is to be treated with hydrochloric acid until no change is shown upon litmus, and then precipitated with the barium salt. The liquid will become acid and contain sulphurous acid.

THE APPROACHING CONVENTION.

FROM what we learn, the Glasgow Convention, which opens its week's *séance* on the 4th of July, is destined to be highly successful.

On the evening of the day mentioned, the proceedings will be opened by the Lord Provost of Glasgow. From the subjoined list it will be seen that excursions have been arranged with great skill, and that these embrace the choice artistic and historical parts of Scotland, at fares surprisingly low. Roughly speaking, the days are to be devoted to sight-seeing, and the evenings to the scientific and literary department of the Convention. Hotels, postal, and telegraphic communications have all been arranged by the energetic Local Committee. Those desirous of details other than we here subjoin should apply to Mr. J. J. Briginshaw, 128, Southwark-street, London, S.E.

SYNOPSIS OF THE WEEK'S PROCEEDINGS.

MONDAY, JULY 4.

Conversazione at 7.30 o'clock.

The proceedings will be opened by the Hon. the Lord Provost of Glasgow.

TUESDAY, JULY 5.

Excursion to the Falls of Clyde, in charge of Mr. Geo. Bell.
Excursion to the Trossachs, in charge of Mr. T. N. Armstrong.
Evening meeting at 7.30 o'clock.

WEDNESDAY, JULY 6.

Excursion to Loch Lomond and Loch Long, in charge of Mr. John Stuart.
Excursion to the Yacht Regatta at Largs (by special steamer), in charge of Mr. George Mason.
Evening meeting at 7.30 o'clock.

THURSDAY, JULY 7.

Excursion to Tarbert, Loch Fyne, by steamer "Columba," in charge of Mr. Wm. Lang, jun.
A group of the members will be photographed at Tarbert by Mr. John Stuart.
No evening meeting.

FRIDAY, JULY 8.

Excursion to Edinburgh. On arrival at Edinburgh the party will be taken in charge by the following Edinburgh friends:—Mr. James Oughton, Mr. William Crooke, and Mr. J. M. Turnbull.
Evening meeting at 7.30 o'clock.

SATURDAY, JULY 9.

A photograph will be taken of a group of the members at 10 o'clock, in Kelvingrove Park, West End.
Meeting of the Committee at 11.30 in the Convention Rooms.

DETAILS OF EXCURSIONS.

TUESDAY, JULY 5.

1.—To the Falls of Clyde, via Hamilton (in charge of Mr. George Bell).—By train, leaving Central Station 7.55, to Hamilton; thence by coach, driving about thirteen miles, to the Falls. Returning from Hamilton at 5.20; arriving back in Glasgow at six o'clock. Fare, for the trip, about 5s. or 6s. Driving from Hamilton, the party passes through

the district called the "Orchard of Scotland." The main points of interest on the drive are Cambusnothan House, Garrison Bridge, Dalsert Village and House, Mauldslie Castle, Milton Lockhart, Ruins of Craignethan Castle, the Tillietudlem of *Old Mortality*. The Falls are three in number—Stonebyers, Cora, and Bonnington; these will fully and pleasantly occupy the day, presenting many fine views to the camera.

2.—*To the Trossachs, via Aberfoyle (in charge of Mr. T. N. Armstrong).*—By train, leaving Queen-street Station, at 8.10, to Aberfoyle; thence by coach, driving about five miles, to Trossachs and Loch Katrine. Returning from Aberfoyle at 3.45; arriving back in Glasgow at 5.30. Return fare to Aberfoyle, 4s. 6d.; coach extra. The party will have several hours to spend among the magnificent scenery at the Trossachs and Loch Katrine. Those who do not wish to go to the Trossachs may walk from Aberfoyle to Loch Ard, the scenery of which is very fine. Boats may be hired on the Loch, or the excursionists may walk round the Loch side. The whole distance round the Loch is twelve or thirteen miles. Most of the stirring incidents in Scott's *Rob Roy* and *Waverley* are represented as having occurred at Aberfoyle and Loch Ard side: as Bailie Nicol Jarvie's encounter with the Highland gillie, the tree where he was suspended in mid-air, &c. If the party should divide at Aberfoyle, some for the Trossachs and some for Loch Ard, they will reunite at Aberfoyle for return to Glasgow.

WEDNESDAY, JULY 6.

1.—*To Loch Lomond and Loch Long (in charge of Mr. John Stuart).*—By train, leaving Queen-street Station at eight a.m., to Balloch Pier on Loch Lomond, returning from Arrocher by Loch Long at 2.30, arriving back in Glasgow by Craighendran to Queen-street Station at seven o'clock. Fare, for the trip, about 7s. The railway to Balloch passes Dumbarton Rock and Castle. The steamer from Balloch sails up Loch Lomond, through the magnificent straits of Balmaha to Luss and Tarbet. Those who wish may leave the steamer at Luss, and walk by the Loch shore to Tarbet, a distance of seven miles. From Tarbet, on Loch Lomond, the party will walk or drive a mile and a half to Arrocher, on Loch Long. This is a fine road, through a lovely and spacious glen. From the Tarbet end of this glen, there is a fine view of "Ben Lomond," and from the Arrocher end the best view of the "Cobbler." The scenery on these two lochs is as grand as any in the world, being a continuous panorama of wooded hill, grassy slope, mountain peak, and precipice. Coming back, the steamer passes through the delightful shore scenery of the Firth of Clyde.

2.—*Excursion by Special Steamer to witness Yacht Regatta at Largs (in charge of Mr. George Mason).*—By train leaving St. Enoch Station at 8.10 to Prince's Pier, Greenock, embarking there in steamer, and sailing to Largs, returning same way, from Prince's Pier at five o'clock, arriving back in Glasgow at 5.50. Fare for the trip, according to number of party, 7s. to 10s. The conductor of the party will fix time and place for going ashore to dine.

THURSDAY, JULY 7.

Excursion by Steamer "Columba" to Tarbert, Loch Fyne (in charge of Mr. William Lang, jun.).—Steamer leaves Glasgow Bridge at seven o'clock, or parties may take the train leaving St. Enoch Station at eight for Greenock, and join the steamer at Prince's Pier. The steamer goes by Kirn, Dunoon, Innellan, Rothesay, and Kyles of Bute, to Tarbert, returning at 1.20, and arriving back in Glasgow with steamer at seven, or by train from Greenock at six o'clock. This excursion is pretty much a whole day's sail—from Glasgow to Tarbert and back, about one hundred and sixty miles—on a favourite and swift saloon steamer, viewing the charming scenery of the Clyde, and spending two hours at the delightfully interesting fishing village of Tarbert. Fares for the trips, 6s.; or including breakfast, dinner, and tea, 12s. This being the only excursion to-day, it has been suggested that a suitable opportunity might be found at Tarbert for photographing a group of the members; arrangements for this purpose have been made with Mr. John Stuart, who will take a photograph of the group on landing at Tarbert.

FRIDAY, JULY 8.

Excursion to Edinburgh, leaving Queen-street Station at 8.45, returning from Edinburgh at five, and arriving back in Glasgow at 6.15. Return fare, 4s.

Offices of the Convention.—London: 128, Southwark-street, S.E.; Glasgow: The Institute of the Fine Arts, 175, Sauchiehall-street.

Railway Stations.—Caledonian Railway, Central Station, Gordon-street; Glasgow and South-Western Railway, St. Enoch-square; North British, Queen-street. All within five minutes' walk of the Convention Rooms.

The Exhibition will be held within the Institute of the Fine Arts, 175, Sauchiehall-street, and will be open daily.

Public Works and Factories.—Should any of the members wish to visit Public Works or Factories, this can be arranged for by giving notice to the Local Secretary.

A list of members attending the Convention will be posted on the Notice Board in the Office and Meeting Rooms. To facilitate the preparation of this list members are requested, on their arrival in Glasgow, to enter their names and where staying on the list at the Secretary's Office. It is hoped that many of the members will find it convenient to be accom-

panied by their lady friends to the opening meeting and to all the excursions.

LIST OF HOTELS.

St. Enoch Station Hotel.—Single bedroom and attendance, 2s. 6d. to 4s.; double ditto, 3s. 6d. to 6s.; breakfast, 2s. to 3s.

Central Station Hotel.—Single bedroom and attendance, 2s. 6d. to 5s.; double ditto, 5s. to 7s.; breakfast, 2s. to 3s.

The Bath Hotel, 152, Bath-street.—Single bedroom and attendance, 4s.; double ditto, 7s. to 8s.; breakfast, 1s. 6d. to 3s.

Philp's Cockburn Hotel, 141, Bath-street.—Bedroom and attendance, 2s. 6d. to 3s. 6d.; breakfast, 1s. 6d. to 2s. 6d.

Alexandra Hotel, 148, Bath-street.—Single bedroom and attendance, 2s. 6d. to 3s.; double ditto, 3s. to 4s.; breakfast, 1s. 6d. to 2s. 6d.

Cranston's Waverley Temperance Hotel, 172, Sauchiehall-street.—Single bedroom, one person, 1s. 6d.; two persons, 2s.; double ditto, two persons, 2s. 6d.; more than two persons, 1s. each; boots and service, each person, 1s.; breakfast, 1s. 3d. to 2s.

The two Station Hotels are five minutes' walk of Convention Rooms, all the others are close by the Rooms.

THE MANCHESTER EXHIBITION.

II.

WE have alluded to Daguerreotypes as being present in the Exhibition. In connection with these there are several engravings possessing so much merit as to have elicited from a competent judge a doubt as to whether anything superior had been produced in modern times even by the most approved photo-engraving process. We may here observe, for the benefit of any reader who may be unacquainted with what was done in former times, that soon after Daguerre's process had been perfected, a great desire was felt to multiply them, for each picture by that process was unique and incapable of being reproduced save by copying with the camera. Strenuous efforts were made to get them etched under such a condition of surface as to hold ink, and ingenious almost beyond measure were the methods tried and adopted.

Through the labours of scientists abroad and at home, including the present Justice, Sir W. Grove, F.R.S., noted in those days as one of our foremost electricians, the problem was solved, and the Daguerreotype plate by being made the anode in an electrical circuit was engraved. The specimens now exhibited in Manchester are, as we have said, exquisitely fine, and their value is enhanced by the knowledge that they were at the time they were issued (about 1843) commercial productions. Whether they were engraved by the process of Grove or of Fizeau is unknown.

Those desirous of seeing the earliest work executed by the collodion-bromide emulsion process cannot help being greatly interested in some prints by B. J. Sayce, of Liverpool, lent by that gentleman. Magnesium light portraits taken by A. Brothers in 1864; the first microscopic photographs taken by J. B. Dancer; glass positives taken in 1851; old photo-engravings by Placet; examples of early combination printing by Brothers in 1862; with wax paper negatives by Talbot and others; even burnt-in ceramics of an early period; these and many other invaluable records of a fast passing epoch in photographic history are all to be found in this rich collection.

When his Royal Highness the Prince of Wales was passing through the photographic department, his eye caught an old photograph which had been taken of the Queen and her cortege during the Art Treasures Exhibition in 1857. He was greatly interested in it, and requested to have a copy of the picture if it were possible. This Mr. Brothers promised should be supplied, a second one from the original negative being still in his possession. But we shall in this Exhibition for a time leave the "Ancient" and descend to the "Modern," and *Place aux Dames*.

Lady Roscoe seems to have in her the making of a high class photographer, and because of this we will point out certain defects in her technically excellent exhibits. In every one we saw the figures are large and pronounced, as they should be in carrying out her idea of illustrating photographically the *North Lancashire Industries*. But the defect is this, these figures are one and all ungracefully posed, most, if not all, of them staring into the camera, before which they are striking attitudes as if imbued with the idea that they were being photographed and that it behoved them to gaze steadily into the lens. If Lady Roscoe would once more go over the same ground and take these industrials by a snap shot when they were unaware

of her intention, a much better series of pictures would be the result, and her ladyship would ascend from being a mere photographer to the higher position of a real photographic artist.

Mrs. Main has three frames of views. Those taken in the Engandine have a lower tone than is desirable for public exhibition. This applies also to her three views from the Nadelhorn; but we know the reason. She has unwisely placed the prints in optical contact with the glass by which they are covered, and this causes a serious degradation of the tone, which is not objectionable when pictures are being examined by a good light at a parlour table, but not so when suspended on the walls of a public exhibition. This lady's frame of frost-covered trees are better in this respect.

Mrs. A. Green shows a frame of portraits, concerning which it is enough here to say that they fairly maintain their own amid a number of fine photographs.

Not so large in dimensions as numerically, the Autotype Company are extensive exhibitors. Whether it arises from the hanging or from the selection of the subjects exhibited, we have not previously been so much impressed with the real merits of their works, which, undoubtedly, add greatly to the importance of the Manchester display.

ECHOES FROM THE SOCIETIES.

MY "Echoes" have been so long silent that I find some difficulty in again rousing them and in picking up the dropped thread of my weekly notes. I shall therefore have to glance briefly at the most important matters that have appeared before the Societies since my last, and bring myself as rapidly as possible "up to date."

First, I notice the proposed alteration of the Photographic Society's Standard of Diaphragms, which was brought before the Society, but which is now, I hope, a thing of the past. I had nearly written my own private protest against the proposed change at the time, but forbore, partly because the Parent Society is not over ready to take advice from outside sources, especially when good and sensible as mine must undoubtedly have been, but chiefly because I had sufficient faith in, at any rate, the "rank and file" of the Society to believe that they—the voting strength—had sense enough to prevent them stultifying themselves by undoing their own work when scarcely yet given to the world, and that at the mere suggestion of an individual.

We need not wade through the extensive and learned arguments delivered in print and at the meeting of the Society as to which is the more convenient number to manipulate, four or the square root of ten, or consider which looks most elegant as a unit, $\frac{f}{4}$ or $\frac{f}{\sqrt{10}}$,

because I do not suppose one photographer in a thousand would ever take the trouble to juggle with either in an attempt at calculation, and I question whether one in a hundred would know how to proceed if he were compelled to do so in order to save his life. So far as the unit of the standard is concerned it is, to the million, a matter of the upmost indifference; the optician marks the stops according to the U. S. value, the photographer does the rest *by table*; in fact, the basis of the standard is practically nothing, any number will work theoretically as the unit of a standard, but the most useful unit will not ensure the standard being recognised. Yet, forsooth! when the representative photographic society of Great Britain, after much labour, proposes such a standard, and by reason of its supposed representative character manages to get that standard largely adopted and recognised both at home and abroad, they are quietly asked, and by some of their own members, too, to abdicate their position as representative, to acknowledge the ignorance and incapacity of the committee appointed to consider the question of this and other standards, and generally to set themselves up to the ridicule of the photographic world. If the discussion of the matter had been confined to the columns of the photographic journals no notice need have been taken, but the matter is allowed to occupy the whole of an evening of the Society's time. This prompts me to ask whether, considering that papers to be read are supposed to be submitted to the Council for approval, and that the subjects, at any rate, *must* be communicated to *somebody* if they are to be announced on the circular calling the meeting, considering this and also the way in which that

particular paper affected the Society, I wonder whether it would have been "passed" if sent in or announced by any one not a member of Council?

A little matter was mentioned at a past meeting of the London and Provincial Photographic Association which is not so really surprising as at first sight appears. A member stated that he had accidentally exposed the wrong side of a plate, but that it had subsequently "come out tolerably well;" I presume the meaning is that it proved to be tolerably sharp. It very often happens that such treatment would actually *improve* a negative, for there is a strong tendency to ignore the foreground in focussing; the distance or middle distance is made perfectly sharp, and the poor foreground left to itself. Now the effect of reversing the plate in the slide would be to remove the plane of greatest sharpness from the distance to the foreground, where it ought to be if the foreground is carefully and artistically selected; and though the distance may not be so sharp as it was made on the ground-glass, it is quite as sharp as it appears to the eye, while the general "crisping" of the foreground objects, which the eye *does* see sharply, altogether improves the picture.

Of course if the foreground is already in sharp focus such will not be the case, but the picture will probably be ruined unless a small stop is used. Still, the difference that the thickness of a glass plate makes in the definition of the image is far less than would be supposed. I have a negative taken under similar circumstances to those referred to, comprising a wide range of view—water, foliage, and distant hills, with a figure perhaps thirty feet from the camera. The distant objects exhibit no apparent want of definition, while the figure will bear enlarging, and this was taken with a lens of only six inches focus.

On the same page of the JOURNAL there appear the reports of the Derby and of the Leicester and Leicestershire Societies, at each of which papers were mentioned on the same subject. But a very comical lesson is read by a comparison of the titles chosen by the respective authors. Mr. Merry tells *How to Reduce in the Camera by Solar Light from Large Negatives for Transparencies for the Lantern*; Mr. Tucker was announced to speak on *Lantern Slides by Reduction*. If brevity be "the soul of wit," Mr. Tucker possesses that soul, but otherwise Mr. Merry must "take the cake."

Some time ago I spoke about the carelessness that exists on the part of those supplying the reports of Societies. A very flagrant case crops up in the report of a meeting of the Birmingham Photographic Society, where Mr. E. H. Jaques, in the course of his paper on *Instantaneous Pictures and Appliances*, gives a formula for accelerating development in which *drachms* and *grammes* are delightfully mixed up together, and a very important item in the composition of the solution (the water) is omitted altogether. As the formula stands, one drachm, or sixty grains, of bromide of ammonium, and ten grammes, or one hundred and fifty-four grains, of hyposulphite of soda—together, two hundred and fourteen grains of solid matter—are to be dissolved in *one drachm* of ammonia.

The word "grammes" may be, and probably is, a slip for grains, but that being so, the reader is left in doubt as to whether any water is to be used in the formula or the ammoniacal solution of bromide and hypo is to be used "neat." The only object there can be in publishing a formula is that it may be of use to the greatest number possible, and I hold that in order to secure that end it is the bounden duty of individuals reading papers, as well as of secretaries or others supplying reports, to see that the "copy" sent to the press leaves their hands in a complete and accurate condition.

Who will say that albumen prints must necessarily fade after reading that the President of the North Staffordshire Amateur Photographic Association, Mr. C. Alfieri, himself one of the veterans of photography, exhibited a silver print by Francis Bedford, thirty years old, which was stated to be "almost" as good as when first printed? The "almost," I imagine, covers deterioration from dirt and wear rather than from fading; at any rate, if a print will remain even "almost" as good as new at thirty years of age, there is good hope of a longer existence.

That was smart work of Mr. Paul Lange's, if performed with a single camera, as reported at the Birkenhead Photographic Association, even though the necessity for changing the dark slides was obviated by the use of a roller slide. Twelve exposures during the brief five

minutes occupied in the boat drill on board a Cunard Atlantic mail steamer must have kept the operator "moving."

Mr. A. Brothers must surely be a humorist "of the deepest dye," or else the reporter of the Manchester Photographic Society has been making him joke at his own expense. He is stated to have said that during the whole course of his professional career he had always been most willing to impart all the knowledge he possessed to members of this Society *except his secret processes*. Mr. Brothers has done much in and for photography, but a reversal of the proceeding would have been something better worth boasting of. Had the worthy gentleman freely imparted to the Society all his "secret processes" and refrained from wasting their time by talking of what everybody already knew, he would have registered a claim to originality that no one would have denied, not even

MONITOR.

PHOTOGRAPHY ON COLOURS.

It is now several years since any article from my pen appeared in any of the photographic journals of this or any other country. I have, however, in this interval, done a considerable amount of work of more or less interest to photographers, and I propose accordingly for a time to take my old place as a contributor to THE BRITISH JOURNAL OF PHOTOGRAPHY, and unburden myself of what I think may interest its readers. This is a resolution I had formed before seeing the issue of the 10th of June. On the substance of an editorial article in that number, *The Latest Thing in Photography in "Natural Colours,"* I propose to offer some observations now, and proceed next week to commence a short series of articles on a "new principle in physical instruments of quantitative measurement" applicable to a variety of objects. But to my present purpose. I object to the phrase, "*Photography in colours,*" or "*Photographs in colours,*" as applied to the pictures of the "Cellerier Syndicate, Limited," as they are seemingly photographs on colours, which, accordingly, they should be called. It is mentioned in the article I have alluded to, that "the first (or among the first) to apply a coloured paper backing to gelatine transparencies, which in those days were made by the Woodbury process, was R. H. Ashton, who, in March, 1866—now over twenty-one years ago—obtained a patent" for a process of the kind. I happened to be associated with Mr. Woodbury and Mr. Ashton at the time. This was not, however, by any means the first instance of photography on colours. I remember well both Mr. Woodbury and I were amazed at Mr. Ashton's obtaining a patent for "his" process, and we required it explaining to us before either of us could see wherein the validity of the patent lay. The validity of the patent, if it were valid, lay in the circumstance that Woodburytype pictures are not photographs at all, but press copies in a semi-transparent ink from pictures in relief obtained more or less directly by the agency of photography. I have not seen a copy of the specification of the Cellerier process (I presume that it is patented), but the probability is that the novelty consists in the use of *developed* gelatine transparencies in combination with a coloured backing. If so, the patent (if any) will probably be valid unless it can be shown that the "colouring behind dodge" has been publicly applied to *developed* gelatine transparencies before, and on this point I am unimpaired.

The patent laws, though much amended lately, are much in want of further amendment still. The "colouring behind dodge," which I myself practised four-and-twenty years ago, is a capital idea whoever invented it, but having become public property so long ago as that, it is absurd that Mr. Ashton, or anybody else, should be able to repent it merely on the strength of using a gelatine transparency, which is not actually a photograph, although beyond all doubt a photograph to all intents and purposes; and it is still more absurd that after this process, too, has become public property, a valid patent should be obtainable for the superposition of an actual photograph on a coloured background merely because that actual photograph is printed by the latest of processes—development on gelatine. Yet I fear this will be found to be the case.

D. WINSTANLEY.

E. EDWARDS'S PHOTO-MECHANICAL WORKS, BROOKLYN, NEW YORK.

At the date of writing it is about a week after the time when I had the pleasure of paying a visit to the above-mentioned works, which

are, I believe, the largest, the oldest, and the most important of the kind in America. If the interest taken by English readers in the subject of photo-mechanical printing is at all equal to my own, they will not be sorry to read a short description of Edwards's works.

The processes worked are collotype, photo-lithography in line, and photogravure. Edwards does not produce type blocks, as he is determined to keep the printing of whatever he produces in his own hands—a thing, of course, impossible where type blocks are concerned, as the great use of them lies in the fact that they may be put up alongside of type. I take the collotype process first—or, as Mr. Edwards prefers to call it, "the gelatine printing process," certainly as good a name as collotype, unless, perhaps, it leads to confusion with other processes, such as the ordinary carbon process and the Woodburytype. By the way, Woodburytype, so far as I could gather, is not worked at all in America, and has never been worked with any great degree of success. In the works at Brooklyn the old process in which the bichromated gelatine is supported on copper plates is used. The effect of the copper is to cause a close adhesion of the film to the support, an effect brought about when glass is used by giving a certain exposure through the glass. Mr. Edwards prefers copper because it is not so breakable as glass, and because he considers the exposure of the film through the latter to be a factor of uncertainty. The copper plates are coated with a plain solution of gelatine and bichromate by hand, and are rapidly dried in an oven. They are then exposed under the negative, a few minutes to bright sunshine being sufficient, the exposure being regulated by the aid of an actinometer. The plate is now washed in water till all trace of bichromate has been washed out of it, and is dried, when it is ready for the press. This sounds very simple, and the operations look very simple, but great experience is, in reality, necessary to get results with certainty.

As regards printing, there are the usual hand presses, and, besides these, two power machines, which appear to work admirably. It is possible, by pushing greatly, to get 5000 impressions a-day from each machine, each impression being from four plates, so that actually 20,000 pictures a-day can be got from each machine, or 40,000 from the two might be turned out. I understand, however, that the ordinary turn-out is about a quarter of this. The plates are etched with a simple mixture of glycerine and water, after which a number of prints may be made without re-damping the surface. It is not unusual to pull 5000 copies from one plate, a number which appears enormous. Edwards, however, explained that plates last much better under the power machine than under the hand press, a thing to hear which certainly astonished me greatly.

The work done is of the most varied nature, everything that can be done by collotype being done there. Enormous quantities of the little photographs of theatrical and other beauties which are given away on packets of cigarettes were notable, as also the large productions of the same nature used as window advertisements, &c. The orders for the small ones are sometimes for several millions at a time. That such miniature pictures can be produced closely resembling silver prints shows how fine a texture of image it is possible to get in collotype. These pictures are printed in a number from one plate. Book illustrations of every kind, too, were being produced, and of large work imitation silver prints for advertising purposes—good as examples of collotype, but not in my opinion admirable from any other point of view. The thing most notable and interesting to me, however, was a series of reproductions of recent photographs by Muybridge. All readers will remember well his photographs of the horse in motion, &c. These, wonderful as they were, were defective, inasmuch as they showed no modelling—were, in fact, mere silhouettes. They were taken on wet plates; although when they were first published, at just about the time when gelatine dry plates were becoming popular, there was a general misconception that they came as one of the early examples of the wonders that could be wrought by the aid of the new dry plates.

In the new series the modelling is as good as could be desired, and the subjects are particularly interesting. There are animals of various kinds—a series showing most accurately a complete cycle of the flying of a bird, for example—but the majority of the subjects are human. They show almost every kind of motion conceivable. Walking, running, jumping, ascending and descending stairs, turning somersaults, bowling, batting, throwing and putting weights, &c. &c. The figures are male and female, nude and clothed. Wherever possible, two series have been taken to show the same cycle of motions, one nude, the other clothed, so that the positions taken by the clothing may be accurately observed. As, however, a number of the photographs represent different phases of dressing and undressing, this cannot be carried out in all cases. Some of the photographs—especially those of children—are, as pictures, quite beautiful. I do not know whether these new efforts of Muybridge's genius have yet reached

England, but it is to be hoped they soon will, as I can conceive of few things likely to be more useful to artists and others.

Of the photo-lithographic work I think nothing particular is to be said, as it is, so far as I know, worked as it is all the world over. The negatives are made on wet plates, and seemed to me much thinner than I should have thought necessary. The image is printed on a piece of sensitised transfer paper, which is then inked up all over. The ink is then washed off, so far as possible, adhering, of course, only to the lines where the gelatine, &c., has been rendered insoluble by the action of light. The ink is then transferred to the stone, and the various processes of gumming, rolling up, etching, printing, &c., are conducted in the usual manner, power machines being, for the most part, used.

The photogravure plates are produced by the Klic process—that is to say, a plate of copper is covered with bitumen in the form of fine powder, so as to produce a grain. The plate is then coated with a sensitised gelatine film, which is exposed under a transparent positive, and afterwards the plate is etched with any fluid which will attack copper, but not gelatine. The result is that the etching goes on less where the gelatine has been rendered insoluble by light than where it has not, a grained intaglio plate being the final result.

Edwards did not show me the actual powdering and etching of the plate, but he told me that the powdering was performed by throwing up a certain quantity of finely powdered bitumen, and catching a certain quantity of it on the plate as it fell. The plates as they came from the etching I saw; they were bold intaglios requiring scarcely any hand work. The hand work, indeed, was, so far as I could tell, by comparing untouched and touched plates, confined to working a little in the very deepest shadows, and burnishing up small touches of high light so as to give sparkle. The plates were printed from at a greater rate than I thought possible, probably because of the boldness of the etching. A plate is inked all over, the greater part of the ink is removed by a cloth, and then the flat of the hand, first covered with a little powdered chalk, is quickly passed over the face of the plate, removing the last trace of ink from the highest light, and becoming apparently without what I may call discriminating rubbing, just the desirable quantity of ink on each spot of the plate. I mean that there appeared to be no necessity to pick ink out of special parts of the plates, or to "dodge" in the inking. The plate is then pressed under an ordinary copper-plate printing press, and the proof came out finished.

A word as to the results. Mr. Edwards does not work the very large sizes that one sees coming from the Continent; but up to a fairly large size produces certainly as fine photogravure work as I have seen anywhere. I have spoken of the etching being bold, but it must not be supposed that the results are other than delicate. They are, indeed, delicate in the extreme. The arrangement of subject, &c., is also generally very artistic. The Meissenbach method of obtaining a grain is used for the photogravure as well as the Klic, but the results are, in my opinion, at any rate, much inferior. A very beautiful result is got by printing from the copper plates on Japanese paper. The texture of this is delicate in the extreme, and this paper is particularly well suited to receive the image. These prints on Japanese paper are mounted with spots of paste at the four corners on a white mount, with a curious and very interesting result. If the mount be held quite flat, so that the Japanese paper is scarcely in contact with it, the image appears very soft and delicate. By bending the mount but a very little backwards the paper is brought into close contact with it, and the image instantly stands out bold and clear.

I must not omit, whilst speaking of Edwards's works, to mention a series of photographs which particularly took my attention. They were a series of theatrical groups done by artificial light on the stage. We have had a good many attempts to produce such pictures in England, and the results have certainly been "interesting," but when that is said, about all that can be said of them has been said. When I saw the groups I refer to, showing the actual action in Shakespearean plays, I remarked, "Ah! but these are from paintings." It is a sad comment on, at any rate, some branches of photography, that whenever we see a particularly good result we incline to think it is from a painting. But so it is. It was long, in this particular case, before I could persuade myself that the groups in question were not from paintings, so perfect were the posing, the apparent action, the grouping, the lighting, and the general arrangement, the scenic background actually giving the idea of distance. I was told that the exposures were only two to three seconds, the lighting being by I am afraid to say how many arc electric lights—I think a hundred. Mr. Edwards expresses his intention of attempting, if he has more work of the kind to do, to get what he wants with drop-shutter exposures.

Mr. Edwards gave me the following interesting statistics as to the number of impressions that can be pulled from plates, the rate, &c.:—"The number of prints that can be taken from one gelatine plate on the hand press varies widely with the printer, the negative, the subject, the paper, and the weather. With a good printer, a favourable subject, in cool weather, 2000 and 3000 copies are not unusual. On the other hand, some plates will only last for 50 copies. The average number does not exceed 250 copies. By machine printing the same conditions hold, but the number of copies is larger; 10,000 from a plate have been printed, but the average number is from 800 to 1000. The average number of impressions a hand-press printer will make per day, taken small and large, does not exceed 150; by the machine, does not exceed 1000. The number of photogravures (here we come into the region of certainties, more nearly) that can be pulled from one plate without re-steeling is 3000; with re-steeling, from 8000 to 10,000. The average number of impressions pulled per day, say, of a subject about 9×7 on paper 11×14 , is 200 to 300."

W. K. BURTON.

PHOTOGRAPHY PAST AND PRESENT.

[A Communication to the North London Photographic Society.]

THE Society whose name has been revived in this flourishing association of professional and amateur skill, was the first photographic society to which I ever belonged, and as now I have been so courteously elected an honorary member of it, I feel much pleasure in contributing my mite in the form of a paper, in which I shall endeavour to call your special attention to that phase of photography that is perhaps more talked about than practised, although I think it is perhaps the only one in which we may anticipate *continuous* improvement.

An opinion I have held for many years past, and see no reason to change, is that the artistic side of photography will eventually dominate every other. Manipulatory excellence has a limit, but artistic excellence has none. We should therefore spare no pains in the improvement of this important quality, and we may rest assured that any care and trouble will amply repay us in much better work. The late South London Photographic Society adopted a plan suggested by myself, with the idea of improving our work in this direction, by instituting a series of artistic competitions, which, somehow or other, did not meet with the energetic support of the members I had hoped to see—may be, the moribund condition of that Society had something to do with it. Perhaps, if a similar plan was revived in this Society, with its redundant energy, the results might be different; anyway, I throw out the hint for what it is worth.

The conditions under which photography now and a quarter of a century ago was worked are so changed they seem to be almost different arts. It is no waste of time if we occasionally devote a little to the discussion of old plans and processes that in their day (scarcely yet passed) have done so much for human progress and contributed so greatly to the happiness and welfare of mankind. There is doubtless hidden in past and discarded methods of working germs that will from time to time blossom forth into useful and valuable ideas, and in some new guise challenge attention, and perhaps bring fame and fortune to those sufficiently far-seeing to appreciate their value. Photography has perhaps afforded more pleasure and effected more good to all classes of society than any other art during the present century, a period abounding in good things and unprecedented in the development of all arts and sciences. At the present time the simplest operation or the most elaborate and scientific investigation receives help and aid from photography, and its usefulness seems ever on the increase. So much has been said and written about it that to say anything new is well nigh impossible, and, whatever it may be, it is little else than a *réchauffé* of old matter gossiped over times and oft.

Photography to its disciples of the present day is mere child's play in comparison with the old wet collodion process. To go out photographing for pleasure then was a serious undertaking, so serious that few save the more adventurous and enthusiastic ever ventured. This was the programme for a day's pleasure in the old days. In the first place a list of requirements had to be gone carefully through—even now this plan has considerable advantages—and the different articles checked off as they were set aside. Now, what were the articles? Firstly came a tent of some kind, with its fittings, bottles, dishes, measures, cups, buckets, and jugs; a long list of chemicals in bottles and parcels, ready-made developer and fixing solutions, plate boxes, draining boxes, racks, brushes, plates and plate holder, collodion, with a great many other odds-and-ends, and last, but most important, that tantalising, worrying provoker of bad language, the nitrate bath. It was almost as customary for a photographer in the old days to ask

his friend how his bath was working as to inquire after his health. The accidents and complaints to which this single important necessary to work was subject was something alarming; it would, after the most fair promises, become afflicted with pinholes, fog, streaks, or markings of innumerable kinds, all objectionable and damaging to the results. You might begin a day's work with everything favourable, then suddenly the bath might go wrong and unworkable just when there was every necessity for things to be working at their best—some especially favourable conditions of light, or some special group difficult to get together. A reserve bath was usually taken, but this added to the weight of the outfit, and time was lost in getting ready this substitution. Making the silver bath right in the first instance was a matter of chemical legerdemain, and keeping it so afterwards a never ending source of anxiety till it was finally boiled down or put to the residues. Then, supposing the bath was right, there was the collodion, which might be too thick or too thin, or not clear, or crapy, or something objectionable. Again, supposing this to be as it should be, the plates had to be coated, perhaps on a windy day in a dusty locality, no easy task without matter getting into the wrong place, causing defects; or the surface of the glass might be defective and show stains and markings on the finished negative. All these difficulties being surmounted, and the plate carefully prepared, exposure right, and development perfect, the film might take to floating off the glass, and ending its career in the drain. Should it escape all these pitfalls, it had to be stored in the draining box, brought home to be dried and finished; these latter stages being rather less troublesome than its modern successor, the gelatine dry plate, save that it was infinitely more tender and liable to injury. When, however, it was successfully finished, the result was simply perfection, and up to date remains a standard for all other negative processes.

It will be readily understood from this slight sketch that outdoor photography was really a serious undertaking, and that much deliberation and thought were required before adopting it as a hobby and recreation. With all its faults, one has a lingering respect for a servant that has done such good duty, and prepared the way by sound and solid instruction for the process which has almost, if not entirely, superseded it. The advantages of a thorough knowledge of wet plate work reduces the manipulations connected with dry plates to a mere bagatelle. The mechanical difficulties, and they were not a few, are almost wholly done away with, unless the photographer makes his own emulsion and coats his own plates, and one inestimable advantage is gained, he is independent of time. With wet collodion it was absolutely necessary to use the plates within a short time of their preparation, for after a few minutes they began to lose sensitiveness. About half to three-quarters of an hour was the time allowed for the longest exposure. Not much was gained by increasing it. The more rapidly they could be used after exciting the better was the result. Many plans were used to preserve their sensitiveness and prevent irregular drying. Wet blotting-paper at the back of the plate, a sheet of glass placed over in front of the film, strips of blotting-paper for the plate to rest on, sponging out the interior of the camera or keeping a piece of damp cloth inside it, the use of deliquescent salts in collodion, glycerine in the silver bath, or a short washing of the sensitised plate in distilled water after exciting with a redip in the bath before development: these and numerous other plans more or less useful were resorted to to beat time. If we add to all this the mess, slop, and stains usually accompanying the preparation of a few negatives, the shyness with which photography was looked upon is easily accounted for and not difficult to understand, and the horror with which the housekeeping authorities viewed amateur photographic experiments is far from obscure. An objectionable process, not always carried on by unobjectionable people, was not altogether the sort of thing to recommend itself as a hobby. Its professors, many of them very estimable men, were looked on with slight favour, photography as a business not being the best recommendation to society. There were some few devotees of the art who courageously strove to raise its social status, but it was uphill work, and it was not until gelatine dry plates became established in public favour that the turning-point was reached, and the hitherto patrons of the photographer became photographers themselves, extending the right hand of good fellowship to those previously looked upon with shyness and misgiving. Since then photography has rapidly advanced in favour, and from being looked upon as a refuge for the destitute and a resort for the needy and disreputable, has become the sport of kings. This, the handmaid of science, is now recognised, appreciated, and beloved by all classes of society, and at the present time no accomplishment is in greater favour than photography. From my experience (and I have no doubt I echo the feelings of many) its pursuit only gives one

a greater liking for it, and has a growing and increasing hold on one's affections if fairly successful results are achieved, and after more than a quarter of a century's practice there is as much pleasure felt in seeing the beautiful, delicate image grow under the developer as ever there was.

Modern photography, especially in the field, is free from nearly all the troubles and annoyances of wet plate work. There is, in fact, no more, perhaps even less, than that attached to water-colour sketching. Under such conditions all the photographer's artistic nature ought to be fully exercised, the art side of photography occupying his entire attention. Making a *negative*, so far as the necessary field work goes, is no trouble. Anybody can do it, but (and there is a good deal in a "but" sometimes) there is in making a picture. I look on it that as soon as proficiency is gained in the necessary manipulations, and they are but few, the whole thoughts of the photographer should be concentrated on the artistic rendering of anything he may attempt to portray. A plate should never be exposed unless there is a fair probability of a picture resulting in the subject chosen. That very common plan of dubbing a failure a study because it is scarcely worth calling a photograph, and certainly is not a picture, is to be deprecated. Sooner bring home your apparatus unused than that the plates should have been exposed indiscriminately on any building or subject that happened to present itself, for, bear in mind, *one thoroughly good and artistic negative* is of more value and will afford more gratification than any number of indifferent ones. The beauty of a good negative grows under frequent inspection, and the faulty one gets more and more disappointing. (It must be understood I refer especially to the capabilities of the negative for producing a good print—its ultimate use—and not merely to the negative itself.) It is not always the prettiest negative that gives the best prints. However, a thoroughly nice-looking negative does not often disappoint one. Let any amateur ask himself what is his percentage of medium and indifferent negatives out of a day's work, and how many artistic and fine compositions, such that some possible and easily-made alteration at the time they were taken would not improve, could be chosen out of a year's work. I am afraid the result would be unsatisfactory.

The low percentage of good work is in some degree due to the anxiety to fire off plate after plate at anything without considering if the object is worth the plate. If all who take up photography as an amusement tried to make *pictures* instead of only sharp negatives, we should soon see an improvement in the work. It certainly requires education of the faculty of seeing even to see a picture. Many will go through a most picturesque neighbourhood and never see anything at all, whilst others will in a far worse locality see a picture at every turn. This training of the eyesight may in a great degree be self accomplished by the careful study of the works of artists of repute, and at the same time making a mental analysis of them by endeavouring to ascertain the why and the wherefore of the position of the various objects, the arrangement of the light and shade; for in all good pictures there is nothing put without a purpose, and nothing can be taken away without in some degree damaging the results. Again, every square inch in some pictures is a picture in itself, so well has the composition been thought out and harmonised in one glorious whole. It may be said that photographers are the creatures of circumstances, and cannot use such discretion in composition as the painter. This is true in a degree, but they have compensating advantages in their command of rendering detail and the power of accurately registering evanescent effects, which are far in advance of any possible hand work. There are undoubtedly subjects that photography fails adequately to represent, also an unlimited number that can be properly rendered, and where painting and photography are on more of an equality as truthful recorders of nature.

One kind of subject we have all been educated to falsely appreciate, and that is the magnification and undue prominence of distant objects. Artistic license says it gives a better and more artistic effect to magnify the distance than to represent it accurately. Is this really so, or is it a matter of persistent error that familiarity has made us regard as truth? There is no doubt that we generally look upon mountains and distant objects in photography as dwarfed simply because we have been used to see them painted on a scale perhaps more than twice as large as they ought to be. Unless the lenses we use are of exceptionally long focus, distant objects do not come up to our expectations as to size, and even then there is an impression that they do not look as important as they ought. This effect is possibly owing to the aerial perspective in the negative being exaggerated and the distances printing much lighter a tint than they should, and becoming technically known as burried; but, whatever the cause, photography at the present time fails to give entire satisfaction on

this particular point. We have, however, plenty of subjects that do give entire satisfaction, and the photographer shows his skill in selecting the most suitable. Here, then, we see the vast superiority of modern dry plates over wet collodion. Thousands of subjects were closed books to the wet plate man that offer most tempting and novel effects quite within the range of the gelatino-bromide film. In going for an outing, he starts without the worry of having to take a laboratory with him and that awful bath, but, provided with a kit that can be put in his pocket or flung over his shoulder, is prepared for all emergencies and is independent of extra aid, his motive power is self-contained, to be exercised at discretion. This independence is in itself a wonderful aid to picture making, and in the wet plate days several attempts were made to provide apparatus that would permit it, for instance, Dubroni's and Edwards's graphogene, neither of which were pleasant to work with, although by chance you might get a tolerable result with either.

The modern photographer has much to be thankful for, and only he knows how much who has struggled with processes in the early days. I sometimes marvel how such good work could be done under such conditions, and a shudder passes through one to think of having to return to the old plans. However, to bring this prosy paper to a close, I would impress on all who indulge in the pleasures of photography that they should pay special attention to the artistic rendering of everything upon which they bring their cameras to bear. No matter how simple and unpretending, it will, if invested with real artistic qualities, be bound to please, when the most ambitious flight without this quality will be unsatisfactory and disappointing.

EDWARD DUNMORE.

THE DERBY EXHIBITION.

THE Summer Exhibition of Photographs at the Derby Corporation Art Gallery was opened on Monday last.

On the previous Saturday the judges, Mr. W. England, Vice-President of the Photographic Society of Great Britain, and Mr. H. J. Whitlock, of Birmingham, having examined the exhibits, made their awards as follows:—

For the Best Photograph in any Class.—Gold Medal—J. Lafayette, Dublin.

PROFESSIONAL WORK.—1. *For Landscape or Seascape, or series of.*—Silver Medal—G. West & Son, Southsea. Bronze Medal—H. Symonds, Portsmouth. Certificate—T. A. Green, Grasmere. 2. *For Portrait, or series of.*—Silver Medal—W. J. Byrne, Richmond. Bronze Medal—McLiesh, Darlington. Certificate—W. W. Winter, Derby. 3. *For Architecture, Interior and Exterior, or series of.*—Silver Medal—Richard Keene, Derby. Bronze Medal—Not awarded. Certificate—J. W. Price, Derby. 4. *For Genre or Figure Pictures.*—Silver Medal—F. Whaley, Lincoln. Bronze Medal—Syd. Sawyer, Newcastle-on-Tyne. Certificate—R. H. Lord, Market-street, Cambridge.

AMATEUR WORK.—1. *For Landscape or Seascape, or series of.*—Silver Medal (given by the Amateur Photographer)—Frank Cooper, Derby. Bronze Medals—J. W. Robinson, Gateshead, and H. B. Berkeley, London. Certificate—Herbert Strutt, Makeney, Derby. 2. *For Portrait, or series of.*—Silver Medal—Not awarded. Bronze Medal—Edwin W. Alabone, London. Certificate—E. W. Alabone, London. 3. *For Architecture, Interior and Exterior, or series of.*—Silver Medal—Not awarded. Bronze Medal—Not awarded. Certificate—James C. Grinling, Barton-under-Needwood. 4. *For Genre or Figure Pictures, or series of.*—Silver Medal—James Crighton, Edinburgh. Bronze Medal—John F. Roberts, Camera Club, London. Certificates—Edwin W. Alabone, London, and W. Clement Williams, Halifax.

Special Certificate for Excellence of Work.—Nine Photo-micrographs by W. H. Pratt and T. W. Cave, Nottingham.

Mr. Keene's Medal to Member of Derby Photographic Society.—W. W. Winter, Derby.

The collection by local photographers is varied, and is generally of excellent quality. W. Winter shows a number of excellent children's and other portraits, and a genre picture, *The Rymester and his Victim*.

R. Keene exhibits a variety of those interior views in platinotype for which he has acquired a well-deserved reputation, together with a series of fine views of Osmaston Manor; while W. Davies contributes views of the charming scenery of Derbyshire; T. Scotton a picture, *Shoeing*, direct from life, the *Entrance to Miller's Dale* and other landscapes taken in the Lake district and elsewhere, together with his large and excellent group of the members of the first Photographic Convention.

E. J. Lovejoy has views of Yarmouth Quay and fishing-boats in that vicinity, with others. J. W. Price shows several snow and frost scenes and a fernery.

The foregoing are local professionals; the amateurs of the Midland town who exhibit include H. Andree, who contributes *Norfolk Broads, Brook Scenes*, in platinotype; Frank Cooper, who shows a view of Old Derby, and others, but whose views at Weston-on-Trent are worthy of special notice. W. G. Haslam has photographs of machinery and other views; H. E. Merry, twelve Derbyshire views; C. L. Schwind, six views of Ferriby Brook, a study of hoar-frost, and other scenes; and C. E. T. Terry, who, in addition to landscapes, also exhibits portraits. These comprise the Derby contingent of the exhibitors. But we must omit mention of others till next week.

The success of the Exhibition is not a little owing to the efforts made by Mr. W. Crowther, the Curator.

PHOTOGRAPHIC PAPERS AND PAPER MAKERS.

II.

THE ordinary papers in the market for commercial purposes may be divided into two great classes, namely, those which are resin sized and are largely used for book and newspaper printing, and those which are sized with gelatine, which is the case with most of the English writing papers. To the latter class of papers attention will now be given.

Perhaps the clearest way of dealing with the subject will be to give the formulæ by which recognised photographic paper is sometimes sized, and afterwards to compare such paper with that sized for writing purposes in the ordinary manner at English mills. Captain Pizzighelli and Baron A. Hubl have published that their plain paper for the platinotype process is free from the ultramarine sometimes used to give blueness to paper, and which turns yellow in any process in which it comes into contact with free hydrochloric acid. The paper they use has a felt-like surface showing no grain, and it is made for them by Messrs. Gustav Röder & Co., of 10, Wallfischgasse, Vienna; it bears the name of "ivory vellum paper" and may be obtained either hot pressed or unglazed. At the mills it is half sized with resin size, so has at the outset a partial power of resisting the absorption of aqueous liquids. Writing papers which have to be finally sized with gelatine are commonly half resin sized in the first instance. On receipt of the paper from the mills they put the final size upon it themselves, by first allowing ten grammes of gelatine to swell for half an hour in 800 c.c. of water; the surplus water is then poured off and heated to about 60°C., after which it is added to the soaked gelatine; when the latter is dissolved, three grammes of alum and 200 c.c. of alcohol are added. Such a solution, they say, does not set if kept in a warm room, heated to not less than 18°C. They then filter it through clean canvas into a tray, and dip the sheets gradually one by one into the solution, then carefully remove air bubbles by means of a hair brush, and afterwards allow each sheet to remain well immersed for two or three minutes in the liquid; it is then drawn out with a rapid and continuous motion, and by means of clips is hung up to dry in a place warm enough to allow the surplus gelatine to drip off, and not to collect in a ridge at the lower end of the sheet. This coating may be accomplished rapidly, and if the drying is quick in winter near a stove, or in summer exposed to an Austrian sun, the second coating of gelatine, which is always given, may be applied in about twenty minutes after the first. In the drying which follows, that edge which was previously lowermost is now clipped so that it shall be at the top, so that the finished sheet may be the more evenly coated over its entire surface. The strength of the sizing solution is sometimes varied to suit the different powers of absorption occasionally exhibited by various samples of paper.

At the outset I may state that I have sized various samples of good English vellum wove papers in the manner above stated, and for iron and platinum processes have so far found them to work without spot or blemish, and on first dipping them into the sizing bath I found out the cause of one class of photographic failures which has sometimes been erroneously ascribed to chemical impurities. In the bath, blotches appeared due to unequal absorption of the liquid, and I saw that those blotches were of the same general shape as faults in prints which Mr. Barker once publicly exhibited as due to impurities in English made papers. Long immersion in the sizing bath did not cause the blotches to disappear; there were evidently portions of the paper which the colloidal solution would not fully penetrate. When the same sheets were subsequently used for photographic purposes, the same irregular spots of unequal absorption of liquids became visible in every bath in which they were immersed; they were invisible in the paper when dry, and invisible in the finished photographs, which had evidently been saved from destruction by the gelatinous substratum which had been applied. This raises the question whether with good and careful sizing many an ordinary paper

may not do for photographic purposes, and whether the absolute purity and evenness of the paper itself are of quite the importance usually imagined.

Possibly my success in this matter was due to my care in using only the best and purest materials, a plan which should always be adopted in experiments intended to clear up scientific points. The gelatine used was not of ordinary character, but the hardest to be obtained, namely, "Coignet's Gold Label Gelatine," which sets at such a high temperature that, unlike Captain Pizzighelli's bath, it would not keep liquid in a warm room, but its temperature had to be constantly kept up by a hot water bath. Hence the word "gelatine" as used by Pizzighelli and Hubl is somewhat too indefinite for practical purposes.

As to the differences in gelatine, the influence of which in sizing papers must evidently be experimentally ascertained, Dr. Eder says that one test of the quality of a gelatine is the amount of ash it yields when incinerated; this varies from one-half per cent. in good samples to five per cent. in those which are inferior, and to ten per cent. if adulterated with alum. Captain Abney, in his *Photography with Emulsions* (London: Piper & Carter, 1882), says that good gelatine should absorb from five to ten times its weight of water, and he gives the following table:—

Name of Gelatine.	Ash, per cent.	Water absorbed by 50 grains.
Coignet's gold label	1 nearly	.. 7 drachms.
" special	1	.. 7 "
Nelson's No. 1 photographic ...	2	.. 5½ "
" opaque	2	.. 8 "
" amber	1	.. 4 "
Ordinary French (not branded) 2	.. 6 "	
Swinburne's No. 2 patent isinglass	1	.. 5¾ "
Cox's gelatine in packets	1	.. 4¾ "
Russian isinglass	1	.. 2½ "
Gelatine supplied through Mr. Henderson	2	.. 8 "
The Swiss gelatine supplied through Houghton	2	.. 5 "

As regards the influence of temperature upon the solubility of various brands, Abney says that Nelson's No. 1 gelatine, in warm weather, will dissolve at the temperature of the room in which it is soaked; the other extreme is Coignet's gold label, which will not melt under a temperature of about 110° Fahr. In their setting powers these two gelatines are the most opposite, for at a temperature of about 75° Fahr. Nelson's will scarcely set at all, whereas Coignet's will set in a short time.

One decidedly good result I obtained by the use of a gelatine of high melting point was, that there was little or no tendency to drip when the sheets were taken out of the bath; the sizing set at once at the lower temperature of the air, only two or three drops of the solution falling from large sheets.

In my next, Pizzighelli and Hubl's formulæ will be further criticised, and problems connected with the manufacture of the papers themselves will be considered.

W. H. HARRISON.

EDINBURGH PHOTOGRAPHIC SOCIETY.

A DEMONSTRATION of stripping films was given before the Edinburgh Photographic Society at their last meeting by Mr. J. M. Turnbull, who explained the working of stripping film negatives, and, in the course of his remarks, gave a demonstration of the removal of both collodion and gelatine films from their paper and glass supports. He said the paper negative was a revival of a very old idea in connection with photography, and the latest form of argentic picture making was in reality, to a great extent, a return to a good old style, the details of which, he said, are, nowadays, only to be found in the records of the history of our art, or in the memories of a comparatively few of our veteran associates. Talbot, whose name for many years distinguished a process, was an eminent pioneer in this field of photography. Our townsman, D. O. Hill, produced pictures of this class, and his negatives were not much behind what we have now. Some of his work, both negative and positive, is to be found in the Society's album, and is characterised by breadth and artistic feeling.

Leon Warnerke brought out his transfer collodion films about twelve years ago, and a good display of them was made at the Society's Exhibition in 1876. His process was to build up on paper a film composed of alternate coatings of rubber and collodion, which, after development—the picture itself being on collodio-bromide emulsion—

was laid down on glass. Subsequently it was damped on the back with benzine, and stripped. He extensively advertised these films at one-third of a penny per square inch. A feature in connection with them was their employment in the making of combination negatives when sky and other effects were desired, sometimes two, and even three, negatives being printed together. In this way also a style of portrait was introduced, the bust being printed as if in an oval frame. These films were slow compared with what we are accustomed to now.

Morgan & Kidd were the first to introduce commercially paper coated with gelatine emulsion, since which time great advances have been made in preparation and practice in relation to it. When the negative is left unstripped from the paper, a certain disadvantage arises, from a degree of grain showing in the finished print, especially in soft sky portions, and when delicate half tones largely predominate. The printing also is slower than with glass negatives owing to this nature of the support. These, and other drawbacks, no doubt suggested and hastened the adoption of the stripping film, which is only new in the sense of its composition and treatment. I may say that I stripped a number of large negatives for our late President, Mr. Lessels, a few years ago, which were intended for collotype printing. I coated the plates first with a thin solution of rubber, before the emulsion was put on. The negatives, on thin plates, were then first coated with collodion, followed with a stripping varnish. They came off quite successfully and easily, and the plate I now strip before you has been treated in the manner I have described. I draw a sharp knife all round the picture about a quarter of an inch from the edge, and by lifting a corner it comes off without any trouble, as you see.

Strippers, as they have been termed, have only been in the market for a few weeks as yet. They are composed of a thin film of soluble gelatine on the paper support, over which the harder emulsion is laid, and which will stand considerable heat without dissolving. When it is decided to strip a negative, I proceed in this way, which I think to be a decided improvement upon that given by the Eastman Company, because it is more simple and more expeditious, and at the same time giving equally perfect results. I found on experiment that there was no need to let the negative dry before stripping. After exposure and development, lay the picture down on glass which has been previously coated with either thin rubber or collodion—I prefer collodion. This should be done in a flat dish of water. When both are in contact, lift out and squeegee down. After two or three minutes, put the plate into hot water, and the paper will begin at once to show signs of coming off. Pull it gently away with the fingers, and you will find the negative now left upon the collodionised glass. A soluble gelatine will be found upon it which is easily removed. Now, while the plate is still wet, lay down the skin upon it which is to act as the final support of the negative; or, what comes to the same thing, coat it with stripping varnish, and set up to dry. I found the formula given with the films took a very long time to accomplish this—some six hours, and often more—and the cause seemed to me to be an excess of glycerine; I therefore have altered it considerably. I take—

Coignet's gelatine	8 ounces.
Glycerine	½ ounce.
Carbolic acid	¼ "
Water	30 ounces.
Methylated spirit	20 "

The gelatine is soaked in the thirty ounces of water, and, when soft, melted, the other ingredients being then added. This varnish will be found to dry rapidly, and renders the use of "skins" unnecessary.

Mr. Turnbull exhibited a negative prepared in this way, and stripped it by the aid of a knife as in the former case. He remarked that development and stripping, when a few negatives are in question, may go on continuously till all are finished, the one becoming ready as the other is stripped. The lightness and portability of these films, either for carrying in the field or transport otherwise, were remarked upon, and the advantages they offered in cases where reversed pictures were required. Mr. Turnbull also alluded to a handy means of levelling plates while coating, which he had published in the journals about 1874. It was to make use of Nettlefold's screws for picture frames by fixing them in a board at points forming a triangle, raising or lowering them as required till a perfect level is obtained. The plate being warmed, coating is then made easy and regular.

The roller slide, and the various improvements effected upon its introduction about thirty years ago, was briefly gone into, Eastman, Lejeune & Perken, Morgan & Kidd, Warnerke, and McKellen's apparatus being severally referred to, as also the tissues of Woodbury, Vergara, Pumphrey, &c.

A vote of thanks was accorded to Mr. Turnbull for his interesting and timely demonstration and remarks.

PERCENTAGE SOLUTIONS—WEIGHTS AND MEASURES.

As a supplement to your article in last week's JOURNAL, on *Percentage Solutions and Weights and Measures*, I have drawn up the enclosed comparative table of English weights and measures, which will, I think, be found interesting and useful, as showing at a glance the relations, as well as the inconsistencies, of our barbarous system. The two columns headed "Parts"—one taking the minim the other the grain as the unit part—will enable any one to translate into parts of either kind any of the units of measure or weight otherwise incommensurable. These columns also show the ratios between the various units. Thus the pound avoirdupois is to the pound troy as 7680 is to 6319.543, or as 7000 to 5760; while the proportions of the three units bearing the name of drachm are as 65.829, 60, and 30. It will be seen that avoirdupois weight and fluid measure are closely connected. To make them identical in form would need merely the change of one of the drachms (which are as 2 to 1), the adoption of the American pint of 16 fluid ounces, and the use of a minim weight in place of the grain. The relations between measure and weight apply, of course, only to pure water at the standard temperature and pressure, and would be affected by the specific gravity of any other fluid or solution.

COMPARATIVE TABLE OF MEASURES AND WEIGHTS OF WATER.

1 minim of water weighs .9114583 grain.
1 grain " measures 1.09714285 minims.

Parts (minims).	Fluid Measure.	Avoirdupois Weight.	Ap'th'aries Weight.	Troy Weight.	Parts (grains).
76800	Gallon	10 Pounds			70000
9600	8	10			8750
7680	Pint	Pound			7000
6319.543	20	16	Pound	Pound	5760
526.629			12	12	480
480	Ounce	Ounce	8	Ounce	437.5
65.829	8	16	Drachm	20	60
60	Drachm	Drachm	3		54.688
30			20	Pennyweight	27.344
26.311			24		24
21.943	60		20		20
1.097		(Grain)	Grain	Grain	1
1	Minim				.911

H. G. MOBERLY.

ON MR. DALLMEYER'S PROPOSED ALTERATION OF THE STANDARDS FOR LENSES OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

[A Communication to the Photographic Society of Great Britain.]

It must not be expected that I have anything new to bring before the meeting to-night, as the subject of my paper has been pretty vigorously discussed during the last month in the *Photographic News*. I think, however, that it is of sufficient importance to receive the serious consideration of this Society. The name of Dallmeyer will command attention to any suggestion concerning that important part of photographic apparatus, the lens, and I need scarcely, therefore, say that we ought to give every attention to anything coming from one of such large experience as Mr. Dallmeyer. I had the honour to be one of the Committee appointed by the Council of this Society to consider and report upon the best means of attaining uniformity in the construction of apertures, in the diaphragms of lenses, flanges, and camera screws. I naturally, therefore, feel great interest in anything bearing on this matter.

The credit of getting a Committee together to arrange standards for photographic lenses is, I believe, due to the efforts of Mr. Warnerke. If my memory serves me rightly, he originally proposed $\frac{f}{2}$ as the unit for our standard apertures; but we found that numbers representing the relative exposures for small apertures became inconveniently high, and, in consequence, $\frac{f}{4}$ was chosen. Moreover, if I remember rightly, the impression was general that $\frac{f}{4}$ represented the approximate full aperture of the ordinary Petzval portrait lens. At any rate, I myself was under that impression; and lenses of this description being in very general use, we thought $\frac{f}{4}$ would be a very good unit to start from. No doubt it is so, but the question now arises, Can we have a better

unit? We are told by a very high authority that we can, and therefore, without prejudice, with a desire for progress, and with that element of conservatism to preserve that which is good, we ought to logically consider the question.

Mr. Dallmeyer wishes us to change our standard from $\frac{f}{4}$ to $\frac{f}{\sqrt{10}}$. To those few who do not quite grasp the difference, I might say that, supposing the present standard aperture required sixteen seconds' exposure, Mr. Dallmeyer's standard would require ten seconds, and would be thus a considerably quicker lens.

Mr. Dallmeyer's reason for the suggested alteration is that the standard numbers would then become a factor of the squares of the denominators of the fraction expressing intensity—in fact, identical, except in the position of the decimal point. Moreover, the system would be a decimal one. There may be a few who would like this more clearly explained. I will, therefore, at the risk of being tedious and rather simple, try to explain what is meant as clearly as possible.

The present standard aperture is $\frac{f}{4}$. Mr. Dallmeyer's proposed standard is $\frac{f}{\sqrt{10}}$, or $\frac{f}{3.162}$ &c.

Now, of course, when we want to compare the relative exposures of various apertures, we know that they are proportional to the squares of the denominators of the fractions representing the respective intensities.

For example, to compare $\frac{f}{4}$, the Photographic Society's standard, with $\frac{f}{8}$ the full aperture of the rapid rectilinear, we square the denominators, which become respectively 16 and 64. Now, if we let the 16 represent unity, we must divide the 64 by the 16, to express the relative exposure of the $\frac{f}{8}$ in the terms of that unit; 64 becomes our divisor, and, as it goes 4 times, we say that $\frac{f}{8}$ requires 4 times the exposure of $\frac{f}{4}$; $\frac{f}{8}$ is, therefore, No. 4 in terms of the standard.

Now, with Mr. Dallmeyer's standard, as soon as we want to express any fraction of intensity in terms of his standard, 10 becomes our divisor, because we start with $\frac{f}{\sqrt{10}}$. To square the $\sqrt{10}$ simply means 10, and 10 is, of course, a much more simple divisor than 16. Comparing $\frac{f}{8}$ with $\frac{f}{\sqrt{10}}$, we square the 8 as before, and then divide the result 64 by 10, which almost every one knows simply means putting a decimal point in, and we get 6.4 as representing $\frac{f}{8}$ in terms of Mr. Dallmeyer's standard.

Inversely, if we want to know the fraction of intensity represented by apertures already expressed in terms of the unit, we must multiply such apertures by the unit divisor, and then the square root of this result will give the denominator of such fraction; thus, taking No. 4 P. S. :—

$$\text{Denominator of intensity fraction} = \sqrt{16 \times 4} = 8 \therefore \text{Intensity of fraction} = \frac{f}{8}$$

Taking Dallmeyer's standard—

$$\text{Denominator} = \sqrt{10 \times 6.4} = 8 \therefore \text{Intensity fraction} = \frac{f}{8}$$

So far I have taken an intensity fraction favourable to the Photographic Society's standard, as it makes a complete number, and one would say that, for trouble of calculations, there is not much to choose; but when we come to small apertures, I think it will be generally admitted that Mr. Dallmeyer's standard gives less trouble, because as soon as we get the square of the denominator the standard terms are visible at once, without further trouble. For instance, let us take $\frac{f}{26}$ (the fourth stop of a 12 x 10 Dallmeyer rapid rectilinear).

Squaring, we have 676, and to get the terms of the Dallmeyer unit we have simply to point off the 6, giving 67.6 as the standard relative exposure. With the P. S. standard, we must divide by 16, and then we get 42.25, the same relative exposure in terms of the P. S. standard.

Now, having explained the nature of the P. S. standard and Mr. Dallmeyer's proposed standard, let us try and see what advantages and disadvantages pertain to both respectively. But, first of all, let me say a word as to the claims of both with regard to being a standard of unity, representing the intensity of the ordinary quick-acting studio lenses. There has been a rather warm discussion on this point for both standards; why, I do not know, for I do not see that it matters at all which is right. For instance, of what use is it to tell a landscape photographer who is using $\frac{f}{8}$ to $\frac{f}{40}$ that in a studio (we cannot define the lighting aspect, surroundings, whether the glass of the studio is dirty or clean, and a host of other things affecting exposure) $\frac{f}{4}$ requires one second? Is there any man here rash enough that could venture to name

the landscape exposure from the data of studio lenses? And the very studio photographer himself—what cares he whether his lens is $\frac{f}{4}$ or $\frac{f}{3.162}$, &c., so long as he knows the comparative exposures required by the diaphragms belonging to his lens? It does not matter what the standards may exactly be, so long as we have a standard to enable various lenses to be used with a tolerable amount of certainty under similar conditions, and I am rather surprised that so much should have been made of this point. Besides, considering the enormous number of lenses of the "B" portrait series sent out by the firm of Dallmeyer, the intensity of about $\frac{f}{3}$ must be pretty general. At any rate, I think this point may fairly be dismissed from the argument.

We will now sum up the advantages and disadvantages of Mr. Dallmeyer's standard.

Advantages.—1. The relative exposures, as shown by the squares of the denominators of the intensity fraction, are with a glance converted into the standard terms.

2. The system is a decimal one, and as long as the base of notation universally remains 10, it is more systematic to adopt a decimal system, where it can be done with advantage.

Disadvantages.—1. The numbers run higher, in representing small apertures, than P. S. standards, in the proportion of 16 to 10.

At first sight I was inclined to include as a disadvantage the point raised by Mr. Debenham, that, to obtain the diameter of an aperture representing unity on the Dallmeyer standard, the focal length must be divided by the awkward figure 3.162, &c. I think I can presently show that this objection does not hold good. The advantage of the P. S. standard over Dallmeyer's standard is, that the numbers representing the relative exposures in terms of the standard are lower.

2. The numbers representing respective exposures have to be divided by 16, and this cannot always be done at a glance.

Now, looking at both standards fairly, I must say that I think Mr. Dallmeyer's standard certainly offers an advantage over the present one.

I think, therefore, we ought to adopt it. The pith of its advantage lies in the division by 10 instead of 16. It saves just half the trouble, as in any case we must square the denominators. There the trouble ends with Mr. Dallmeyer's standard, for we cannot count division by 10 as anything; but with the other we have 16 to divide by—not very serious, but still there it is.

Besides, though it is well known that many scientific men deplore the fact that the universal notation is based on 10; yet, while that fact remains, I think we ought to base our calculations on as much a decimal system as possible. Now we come to the disadvantage of the higher numbers in Dallmeyer's system. I think, after consideration, that this disadvantage is not equal to the advantage; in fact, the difference is not great enough to have any practical effect. I will now say a word on the objection raised by Mr. Debenham. I think he has forgotten that there is only one case where division by $\sqrt{10}$ is necessary. It is, as he points out, when an aperture is required representing the unit value itself. In no other case does the division by 3.162, &c., really occur. Besides, how rarely in these days of rapid plates we meet with a lens that would permit an aperture of the unit value, even supposing that we cared to do the optician's work and make our own unit diaphragm. Surely it does not need argument to say that the general and easy comparison of relative exposures is the point we wish to obtain, and not the making of one diaphragm of the unit value. I say one diaphragm, for in no other case does 3.162 become the divisor. We must bear in mind that any lens under the rapidity of the unit stop would not permit a unit stop to be made for it; besides, it is doing the work of the lens manufacturer to make diaphragms, and does not come under the general comparison of lenses. Once we leave unity, both systems are pretty well equally troublesome, supposing we want to make a diaphragm for No. 2 in each standard respectively. For P. S. standard we have $\sqrt{16 \times 2} = 5.65$, &c. Intensity

fraction $\frac{f}{5.65}$, &c. For Dallmeyer's standard we have $\sqrt{10 \times 2} = 4.47$, &c.

Intensity fraction $\frac{f}{4.47}$, &c. There does not seem much to choose here.

In the P. S. standard we shall get whole numbers, in making diaphragms for relative exposures represented in terms of the standard by 1, 4, 16, 64, &c., as the result, extracting the square root; but as calculations are so rarely made by the photographer in this respect, it is not worth consideration.

There is another point which must not be forgotten by those who wish to make their own diaphragms; it is that in double combination lenses the diameter of the diaphragm is not the measure of the actual pencil of light transmitted by the lens, and therefore it requires an optician's knowledge to make diaphragms accurately to a given intensity.

Diaphragm making is not common amongst photographers, nor will it ever be so while we can leave this matter to those who best understand it. I think I have shown that for diaphragm making there is really nothing to choose between both standards. Should any one not think so I shall be very pleased to refer to this point during discussion. On the whole, then, I am myself in favour of altering the standard, but I hope that others more experienced than myself will discuss the matter thoroughly.

It is, of course, to the opticians we must look for the greatest advantages to be derived from a standard unit for relative exposure. If they would only co-operate we ought to have all the numbers in terms of the unit without a single decimal figure to mar the simplicity. I am not optician enough to say if this could be done absolutely, but practically I think it might be so. We had good evidence, from experienced men on the late Committee, that for all practical purposes diaphragms giving a relative exposure of twice the next largest aperture were sufficiently close. It follows from this that if we start from a standard unit the only intensities that ought to exist at all would be represented in terms of the standard by 1, 2, 4, 8, 16, and so on; and lenses having a full aperture of less rapidity than the standard should have their full apertures represented by one of the series just mentioned. Were all lenses so made, they would all be comparable with each other at a glance. By simply dividing any of the standard terms into each other—the smaller into the greater—we should at once, in definite and simple figures, see the comparative exposures required.

In conclusion, I trust that this matter will receive attention from this Society and be discussed on all its points. JAMES CADETT.

RICHMOND'S SHUTTER.

THESE are some very ingenious movements in this shutter, which was exhibited and examined with a good deal of interest at the last meeting of the North London Photographic Society. As we promised on that occasion that a detailed account of its parts would appear in this JOURNAL, we now fulfil the promise. Premising that it is very portable and tight, we subjoin a cut with explanations.

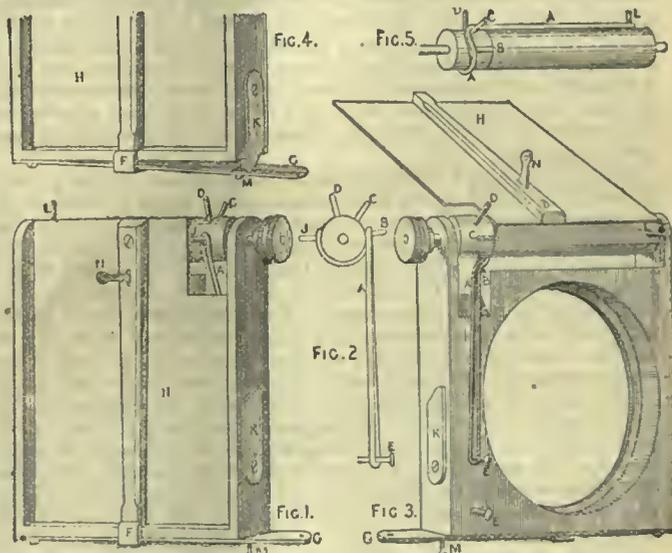


Fig. 1, front view after an exposure. To set it ready for rapid use take the elastic band A, lap it round one of the spurs B, C, D, and hook it over the pin E, as shown in Fig. 2. Pressure of the finger upon the end G of the spring catch F G will permit the band A to pull down the pin B, which raises the shutter H, as seen in Fig. 3. The band A then slips off the spur B, and acting then upon the spur J, instantaneously closes the flap, as shown in Fig. 1. The rapidity may be increased by putting more tension upon the band A by lapping it round the pin E instead of E, and still further so by lapping it once, or more, round both pins. The amount of opening will be made greater by putting the band A over C or D instead of over B, and by so doing the duration of full opening will bear a larger ratio to the whole exposure, and the picture will be more equally illuminated. If the band A be lapped over the spurs B and D twice or more, a fluttering motion will be imparted to the flap H, with a corresponding increase in the length of exposure.

By setting the detent K to keep open the spring catch F G, as shown in Fig. 4, the flap may be operated with considerable rapidity by twirling the milled head between the thumb and finger. While thus set, the shutter may be opened from behind the camera, if a cord be attached to the projecting eye N, in which case a very light counterbalance weight at the other end of the cord will enable the operator to put it out of his hand during exposure. If, while the detent is in this position, the band A be passed under the rocker, over the spur C or D, and then looped over the pin L, it will lie temporarily out of use, as shown in Fig. 5. The flap H can now be used by turning the milled head and any exposure can be given. Focussing can be done with the shutter so arranged, more especially at such times as it is not intended to take an instantaneous picture.

In the absence of an indiarubber spring a small piece of sewing cotton, thread, or silk, may be passed over the spurs in the same manner as described for the elastic. The instantaneous exposure may then be made either by pulling the end of the thread downward, or attaching something to it as a light weight, the falling of which, when the spring catch is depressed at G, will open and close H with great rapidity.

Both parts of the elastic band must be put over the spurs, as shown at B, Fig. 3.

PHOTOGRAPHING COLOURED OBJECTS ON PLATES BATHED WITH ERYTHROSINE.

[A Communication to the Photographic Section of the American Institute.]

I FEAR that many of the members here present will not be satisfied with what I am about to show them this evening, for I do not come to exhibit reproductions of very beautiful works of art, like the paintings of Meissonier or Bougereau, printed from retouched negatives by laborious mechanical methods; neither am I prepared to show you photographs of spectrum colours. As a substitute for the sun spectrum we (meaning many practical photographers) have made our experiments with colour sensitive films upon artificial spectra, and noted our results in comparison with those of our eminent instructors in Germany and Austria.

Artificial spectra, or rather combinations of pigment colours resembling the colours of the spectrum, are somewhat difficult to contend with, as various colouring matter gives very varying results. Of several attempts made I will mention pastel colours, which show too light on the plate in every way, while those of silk or satin ribbons are indecisive, leading to many errors when judging of true colour values. Oil paint is generally too dark; aquarelle better. Of all the artificial spectra made, that of E. Bierstadt, constructed of coloured matt paper, is probably the best.

Anxious to keep pace with the progress made everywhere, and being convinced that colour sensitive methods must be eventually resorted to in sky-light and reproduction room, my aim has been to experiment with brightly coloured objects as seen in the everyday walks of life, and I have photographed chromo-lithographs and the like, selecting such as showed very brilliant and sharply contrasting colours. Before I take the liberty of laying a few of my results before you, I deem it necessary to say something of my mode of working. What has been done in colour sensitive processes since 1882 is generally well understood. Of the 144 different sensitizers which Dr. Eder has experimented with, only a few have been retained as being effective, among them the eosine group and the chinolins are perhaps the best.

When Clayton and Tailfer published their process of dyeing emulsions with eosine, they said that the same effect might be obtained by staining a ready coated plate instead of incorporating the dye with the emulsion before coating. Other European experimenters denied this, and asserted, until quite recently, that a stained or colour bathed plate could never give the same results as a coloured emulsion. For my own part I had no other means at command than to bathe plates. A few attempts to colour emulsion failed totally, and other experimenters, I am sorry to say, did not do much better, so that, as we were to consider the enormously costly imported azalin and eosine plates, there was nothing left us but to go on in the other way. As the suggestions made by A. Tailfer proved successful, I continued to work in the way proposed, and I do not think that of my many experiments I can remember half a dozen made on emulsion coloured plates. We cannot deny that bathing plates with the aid of ammonia is practical enough for all purposes. We can prepare any number of them, large or small, at a moment's notice, the operation taking but little time and requiring no extra skill, and we can expose the plate wet or dry. Stained plates keep much longer than even their advocates give them credit for, and I will show you a picture from a plate exposed thirty-five days after being sensitised for colour. I think that will do.

Of dye stuffs used we will see the effects of eosine, erythrosine, pure and when mixed with cyanin, and also those of azalin, or, more correctly speaking, if we wish to express the compound nature of the colour, chinolin red plus chinolin blue. Eosine has not given the generally good results claimed for it. Cyanin or chinolin, the most red sensitive substance known, is extremely difficult to work with, and has been applied as an addendum only to other matter, while for total effects, or when a variety of many colours are represented in one object, none gives better results than the erythrosine. With it we reproduce yellow in all shades quite correct, equally so green and orange, and while the action of blue and violet is retarded by the colour screen, we have red only that does not always respond properly. Not all reds copy alike. Minium I found to be the most difficult, and oxide of mercury next to it. Iodide of mercury and vermilion show much better. Carmine, lake, madder, not being pure reds, copy easy accordingly.

For general work the interposing screen cannot be dispensed with, be that a cell containing a coloured liquid or a coloured glass. I generally use a white, plane, parallel glass, coated with a collodion coloured with a tincture of Bengal curcuma, to which I add a little eosine to make it more of an orange tint. Sometimes I put a drop of cyanin solution to it to give it a greenish cast. When to use screens of different colour or shades of colour, practice will soon tell.

When the colour screen is used the time of exposure must be extended. Comparing it with that of an ordinary plate, we can say the proportion is from one to three or four; seldom greater than this.

A great difficulty occurs when judging colour brightness, and I can assure you that out of a dozen people not three will see colour alike. To some a blue appears darker, or a red lighter; to others it seems impossible to see yellow correctly. Thus I have found why so many different views on colour sensitive results can exist.

Erythrosine, giving the best general results, has become an article of trade. It is prepared in such convenient and compact form that it is available to a practitioner as well as tyro, and as long as the formula accompanying the dye is followed, there can be no doubt of brilliant success.

CHARLES EHRMANN.

Our Editorial Table.

PICTURES FROM LIFE IN FIELD AND PEN.

By P. H. EMERSON.

London: George Bell & Sons, York-street, Covent Garden.

WE have here a goodly portfolio containing twenty photogravures from negatives by Mr. Emerson, who dedicates the work to the memory of "Nicéphore" Niépce, a misprint, doubtless, for Nicéphore.

The author, in the introduction, gives as the first principle of all art a faithful adherence to nature. Wherever the artist has been true to nature, art has been good; wherever the artist has neglected nature, and followed his imagination, there has resulted bad art. Nature, then, should be the artist's standard. In meeting some objections and prejudices urged against photography because, *inter alia*, it has been called a mechanical process, he says, "Much has been written against it by incompetent photographers, who, at the same time, never rose beyond mediocrity in the branches of the art they professed. One of these has stated that its results are false in local colour. This may have been true when he wrote, but since the introduction of orthochromatic plates, and the process of photo-engraving, the accusation is no longer just. By photography the relative values can now be rendered quite correctly. Another charge brought against it was falseness of perspective, or drawing, we presume they mean. This any good photograph will promptly refute; no other evidence is required. The idea of the falseness of perspective arose from the fact that some photographers, by an ignorant use of the lens, produced distortion; and we can only say that the critic who advanced such a theory, if a photographer himself, must have been a very incompetent one, and his opinion of matters photographic therefore worthless. We know of no objections having been brought against photography as a means of artistic expression by any practical artist of genius, or even repute; and for the opinion of mediocre artists we care little."

The plates comprising the *Pictures* in the portfolio are photogravures by various firms—A. & C. Dawson, Boussod, Valadon & Co., Walker & Boutall, and the Autotype Company. We infer from the author's remarks that they are untouched, or almost so. In some of them there is evidence that they would have been improved by judicious touches of the scraper or burnisher, to bring into more prominence details which are hidden, and impart brilliancy and sparkle to the high lights. Even the roulette might have been occasionally brought into play with effect, such as in the face of the *Sticklebat Catcher*.

The little picture, *A Misty Morning in the North Sea*, which is of half-plate dimensions, is among the most beautiful, certainly the most technically perfect of the series. It is sharp and crisp, yet soft, full of detail, and in perfect gradation, and is in strong contrast to certain others in which these qualities have received minor consideration.

Sunrise at Sea is also a fine picture. *A Suffolk Dike*, perhaps the best of the series, is suggestive in its quality of Mr. Emerson's last published photogravure, *Gathering Water-Lilies*, and is free from a certain defect which is noticeable in some others, namely, the sinking of detail of important portions and ignoring any approximation to sharpness in the distance, faults which are doubtless due to the engraver, and in one or two instances to the lens.

The picture in which these negative characteristics appear most strongly is *The Gaffer*, the face of the man being lost, which we

feel certain would not have been the case had the engraver bestowed a little pains upon "cleaning" that and other portions of the picture. But, taken as a whole, the *Pictures from Life* constitute a fine collection of life scenes, which are both interesting and instructive.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 8577.—"A Carrier for Holding Photographic Films or Papers during Exposure." W. L. SARJEANT.—Dated June 15, 1887.

No. 8711.—"Improvements in Apparatus for Regulating Exposures in the Use of Photographic Shutters." T. R. DALLMEYER and F. BEAUCHAMP.—Dated June 16, 1887.

PATENT LAPSED.

No. 1229.—"Photographic Card Pictures." A. H. DAWES.—Dated 1883.

PATENTS COMPLETED.

IMPROVEMENTS IN INSTANTANEOUS PHOTOGRAPHIC CAMERA SHUTTERS.

No. 9522. WILLIAM JAMES LANCASTER, Colmore-row, Birmingham.—July 23, 1886.

My invention relates to instantaneous photographic camera shutters for effecting what is generally known as instantaneous exposure, whereby light is allowed only to pass momentarily through the lens or exposure aperture; and my said invention consists essentially in employing an eccentric shaped shutter hung or pivoted above the exposure aperture, and before which aperture the said shutter is flirited or partially rotated from right to left by means of, or through the influence of, a volute spring secured at one end to a turning axis and at the other end to the shutter or to an enclosing casing carried by the shutter.

The spring is kept in a varying degree of tension by a ratchet wheel and pawl.

In carrying out my invention, the frame of the shutter is preferably made in two parts, or of two plates, somewhat of the shape of a fanail or the segment of a circle; and on the outside or upper plate the shutter works, and which shutter is pivoted above the exposure aperture, situated at the lower or widened-out part of the frame.

A suitable catch holds the shutter in position until exposure is necessary, and a stop or stops limit the shutter's motion when it is flirited or rotated.

Around the pivot pin or axis upon which the shutter is hung is a volute or coiled spring, secured at one end to the axis and at the other end to an enclosing case carried by and upon the front face of the shutter.

The shutter's velocity is determined by closing the coils of the spring more or less upon each other, and so increasing or decreasing the tension according to the velocity or speed which the shutter is required to be flirited in front of the exposure aperture.

The spring is kept at any determinate tension after winding or coiling by a lever pawl and spring, the former engaging with the teeth of a ratchet wheel.

Instead of employing a volute or riband spring as described, a rubber band or a flat spring (the latter acting upon a pin) may be employed.

To work the shutter, first adjust the spring to the speed required or to the length of time that the shutter shall be made to take in passing over the exposure aperture, the shutter is then turned into its normal position and held there by a spring lever catch, which on being released therefrom is momentarily flirited from in front of the exposure aperture and back again, making the exposure longer for the foreground or lower part of the picture than for the sky, which is an advantage in landscape photography.

The claims are:—1. An eccentrically hung or pivoted instantaneous photographic camera shutter, or shutter plate, which when partially rotated, or turned, uncovers and recovers the exposure aperture, progressively from bottom to top, and *vice versa*: thus giving to the bottom of the said aperture, or to the foreground or ground work of the picture, a longer exposure than the other or upper part, substantially as described and illustrated. 2. In automatic holding and releasing catch-lever mechanism, consisting of a spring arm, ear, or snag on the said arm, and rest (carried by the shutter frame) in combination with the short arm of the shutter, substantially as described and set forth. 3. Operating, turning, or partially rotating shutters, or shutter plates, by a volute or evolved spring, secured at its inner end to a movable axis (or its equivalent), and at its outer end to the shutter, or an enclosing case carried by the shutter; and which said spring is wound up, and secured at the desired tension for giving the requisite or time exposure by a screwed turn, ratchet wheel, stop, lever pawl, and spring. The parts being arranged, combined, and acting in the ways, and for the purpose, substantially as described and set forth. 4. Arresting without shock the motion of camera shutters by means of a flat or coiled spring, against which an arm on the camera shutter strikes or impresses, substantially as set forth. 5. The improvements in the construction of instantaneous photographic camera shutters, and the arrangement and combination of the parts of the said shutters, as hereinbefore described and set forth in the several figures of the drawing.

IMPROVEMENTS IN THE PRODUCTION OF PHOTOGRAPHIC IMPRESSIONS.

No. 5080. JOHN JABEZ EDWIN MAYALL, Southwick, Sussex.—April 5, 1887. This invention has for its object the production of permanent photographic impressions, whether coloured or uncoloured, on any suitable material. According to this invention, I first take a negative, preferably by electric light, but it may also be taken by sunlight, in the ordinary way; I then print a positive on paper, porcelain, or other suitable material, prepared as follows:—For paper I soak it in a weak solution of gelatine and lactate of iron, in

about the following proportions, namely:—Two grains of fish glue or isinglass to one sixteenth of a grain of lactate of iron, in one ounce of water, the whole being boiled and subsequently filtered. The paper, after having been immersed for about three minutes in the above solution, is dried and smoothed; this may be done by placing it between blotting-paper and submitting it to a slight pressure. I next float the paper thus prepared for about two minutes on a bath composed as follows, namely:—To about one ounce of albumen (preferably taken from fresh eggs), four grains of chloride of sodium, half a grain of bromide of potassium, two minims of glacial acetic acid, and one drop of a concentrated solution of some derivative of silicic or of hydrocarbon, of which I have found salicylic acid, prepared according to my invention, and for which I intend to apply for letters patent, to be very suitable; the whole must be beaten up into a frothy mass and allowed to settle for about twelve hours. Any tints may be given to this mass by adding the desired colour solved in a saturated alcoholic solution, in the proportions of about one minim of alcoholic solution to about four ounces of the albumen solution above described, and one minim of meconin or its derivatives; the whole is then beaten up and allowed to settle.

After floating the paper it is then dried by slow heat, and ironed on the back to make it perfectly dry and smooth. I then prepare a bath of nitrate of silver and nitrate of soda and free ammonia, in the proportions of about one ounce of water to forty grains of nitrate of silver, ten grains of nitrate of soda, and three minims of free ammonia; and when pliability of the paper is desirable, I add to the bath five drops of glycerine per ounce of bath solution.

The paper is then floated face downwards on this bath for about two minutes, and then dried in a dark room, after which it is fumigated in an atmosphere of ammonia for from three to five minutes, and is then ready for printing upon in the ordinary way. The prints, after fixing, must be soaked in a weak solution of sulphuric acid, to expel any trace of the hyposulphite of soda and well washed. The printed impression in a moist state in then mounted face uppermost on a piece of glass or skeleton frame, and, when dried, the desired colours, prepared, as hereafter described, are then dabbed on by suitable means, and slightly stumped. The dabber which I find suitable for this purpose is a pad of fine cotton wool pushed through a glass tube so as to protrude therefrom, and cut square and even at the end. This cotton wool must either be renewed for each colour or a separate dabber made as above kept for each colour.

After the colours have been applied the paper is rendered impervious to moisture by having applied to its back and front some such substance as white wax or paraffine or camphor, the print being sufficiently warmed for the purpose of the application of the wax. The colours must be stronger than are required for the final effect.

The picture is then sprayed over or subjected to an atmosphere charged with a weak alcoholic solution of salicylic acid, or some derivative of silicic or hydrocarbon, paraffine, or of any preparation of fluorine solved in alcohol to set the colour, and then it is subjected to the action of finely powdered soluble glass; this I propose to effect as follows, namely:—By placing a powdered silicon in a suitably closed chamber, provided with shelves and fitted with bellows, so as to blow the silicon powder into a cloud. The coloured picture is then put on one of the shelves to catch the fine dust of the silicon for a very few seconds, after which it is taken out of the chamber. The picture (face downwards) is then laid on a plate of glass coated in the following manner. After having rubbed the glass with a dabber of any suitable material (for which I use a ball of cotton wool covered with leather), charged with powdered silicon, I coat it with collodion, to which is added one drop per ounce of salicylic acid, and when dry I recoat it with gelatine and salicylic acid in about the proportions of one drop of acid to one ounce of gelatine, and again dry the plate. The surface of the print must now be moistened with some hydrocarbon, such as paraffine or kerosene in solution, to which is added a few drops of salicylic acid in the proportions of about two drops of salicylic acid to the ounce of hydrocarbon, and when sufficiently moist the picture is well pressed down upon the gelatine surface and allowed to dry in a warm atmosphere, after which it is stripped from the glass, and when mounted on card, porcelain, or other desired material, produces a permanent and finely coloured photographic picture.

If it is desired to have a brilliant picture, it is necessary that the entire process above described should be conducted without any delay or intermission in the various portions of the process, and in an atmosphere of increasing temperature, as if in the process the print is allowed to become chilled, a dull appearance is the result, which dull appearance may, however, be sometimes preferred.

For printing on porcelain and suchlike materials I coat the material with collodion-chloride of silver or carbon tissue on the albumen solution above described, the subsequent treatment being the same as that already described for paper.

For the production of uncoloured photographs, the process is similar to that above described, omitting the colours.

The colours I employ are ordinary colours in a dry state ground up with phenic acid and silicate of potash, or kerosene and silicate of potash in alcohol in about the following proportions, namely, one ounce of dry colour to sixty grains of phenic acid and twenty minims of silicate of potash, or sixty grains of kerosene to twenty minims of silicate of potash. In the above manipulation care must be taken to exclude all organic matters other than what are above described.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—The production of photographic impressions, whether coloured or not, substantially as set forth.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting will take place on Tuesday next, June 28, at eight p.m., at the Gallery, 5A, Pall Mall East, when the subject will be *Camera Stands and Outfits*; also a negative on "Balagny's" flexible film will be developed.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
June 28	Great Britain (Technical)	5A, Pall Mall East.
" 28	Bolton Club	The Studio, Chancery-lane, Bolton.
" 29	Photographic Club	Anderson's Hotel, Fleet-street, E. C.
" 29	Liverpool Amateur	Royal Institution, Colquhoun-street.
" 30	Oldham	The Lyceum, Oldham.
" 30	London and Provincial	Mason's Hall, Basinghall-street.
July 1	Yorkshire College	
" 1	Halifax Photographic Society	M. Manley's, Barum Top.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday, June 16, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. W. H. Prestwich presided.

Mr. A. L. HENDERSON exhibited lantern slides representing instantaneous views of horse-races brought to him by Mr. S. E. Barr, of Messrs. Porter & Coates, Philadelphia; he remarked that they were among the finest he had seen: He also exhibited some of his own views of the Jubilee Yacht Race at Southend, taken from the deck of the "Norham Castle."

Mr. J. B. B. WELLINGTON exhibited platinum prints of views taken at Chislehurst.

Mr. J. E. BROWN then said, The first formula I wish to bring before your notice is perhaps the most simple and, to my mind, the most effective one I have used for retouching on dry plate films. I could never see the necessity of using ten or a dozen chemicals if two would do and give results as good. Formula:—Take powdered gum dammar, one ounce; best white turpentine, *quantum suff.*; this is applied with a piece of rag or sponge. When the film appears very horny or bright I rub it with a little dry cuttlefish just before applying the medium. For a long time I advocated and used the following medium for retouching:—Take Venetian turpentine, six drachms; common resin, four drachms; mastic varnish, two drachms; spirits of turps (rectified), two ounces; benzine, about half a drachm; camphor, fifteen grains; make up to the consistency of negative varnish by an addition of white turpentine. Now I have given up this formula in favour of the first one, which is more simple to work and does not interfere with the progress of the pencil by tackiness. The next recipe I wish to bring before your notice is one for making hard negative varnish:—Dissolve half an ounce of orange shellac and half a drachm of camphor in about a pint of methylated spirit; when dissolved add about a tablespoonful of pumice-stone (powdered)—some people recommend ashes; shake well and let settle over night, in the morning it will filter beautifully clear; if too thick, add spirits of wine. For intensifying I have always found the following safe and practical:—A. Bichloride of mercury, one ounce; chloride of ammonia, one ounce; potassic iodide, one ounce; dissolve the mercury and ammonia salts in ten ounces of water, putting them both in together, and add sufficient of the strong iodide of potash solution; shake well, and make up to twenty ounces with water. B. Silver nitrate, half an ounce; potassium cyanide, sufficient to dissolve out the first precipitate; now make up this bulk to twenty ounces with water. This solution should not be used at full strength when little density is required but diluted to half. The fixed and well-washed negatives should be placed in a dish containing the A solution and gently kept in motion for a few seconds; examine from time to time until it appears quite dense, take out and well wash again until the film is an even yellow all over, then place in a dish containing the B solution, and let remain until the film becomes a beautiful olive-brown, then lift out and set aside to dry. Another formula very much used in Melbourne is a saturated solution of bichloride of mercury and iodide of potash; the negative is whitened in this, washed, placed in a saturated solution of sulphite of soda, but do not allow the negative to remain sufficiently long to reduce.

Mr. HENDERSON liked Monckhoven's intensifier, consisting of iodide of mercury followed by silver.

Mr. A. COWAN said that that was Monckhoven's formula.

Mr. W. M. ASHMAN exhibited a negative intensified with iodide of mercury, followed by sulphite of soda.

Mr. J. J. BRIGNSHAW said that the railway companies north of London had combined not to give reduced fares to public associations.

Mr. WELLINGTON stated that the Photographic Convention at Glasgow could be reached by boat and train from London *via* Leith, first-class fare there and back 19s.

The proceedings then closed.

CAMERA CLUB.

ON Thursday evening, June 16, a short paper, entitled *Film Staining and Halation*, was read by Mr. Lionel Clark. Mr. F. Machell Smith occupied the chair.

Previous to the address, Mr. J. F. Roberts exhibited a compact detective camera introduced by Messrs. Watson & Sons, in which the plates were dropped into their place from the double holders in which they were stored. The focus could be adjusted by means of a movement of the handle by which the apparatus was conveniently carried. A rapid rotary moving shutter was fitted to give the exposure.

Mr. W. A. GREENE showed some experiments in printing-out positive images by long exposure on Eastman negative paper, and

Mr. D. P. RODGERS drew attention to some strong paper envelopes just introduced, which were made to sizes for storing different negatives in, and were prepared outside for the entry of particulars.

Mr. CLARK then gave his lecture, and in discussion

Mr. RODGERS said the slowing effect of litmus in staining might not be of great importance, seeing the rapidity of plates as now made, but

Mr. CLARK stated that it would appear to have the effect of reducing them all to a standard rapidity not many times faster than wet plates.

Mr. J. TRAILL TAYLOR explained a method (by piston and cylinder) by which he had obtained a clear turmeric solution. He had observed that in looking out into the light from Fingal's Cave the phenomenon of the interference of light or halation appeared at some of the openings and not at others, where, presumably, the atmosphere was clear of dust or vapour. In referring to the backing of plates, he described a simple but pretty experiment, showing halation to be obviated by a substance being brought into optical contact with the glass.

Mr. H. H. O'FARRELL asked why tinctures were not used in isochromatising plates.

Mr. HYSLOP stated that the colour did not seem to enter the film so well or homogeneously; some of the dyes would not dissolve in alcohol and some in water, but required half-and-half. He had found some difficulty with cyanine as with alcohol; it gave a small deposit. He found the fuchsine he had used slowed the plates, and it was a substance it was extremely difficult to get rid of from the films it was used in.

Mr. A. PRINGLE said in the early days of gelatino-bromide plates the use of a backing was nearly always adopted, but when iodide was introduced there was less necessity for such treatment. His experience was in agreement with Mr. Hyslop's that iodide plates treated with isochromatising solutions were as good as bromide plates treated similarly. He had not, however, found his samples of fuchsine have any slowing effect upon the plates treated with it, though there was some difficulty in dissolving it.

Mr. CLARK had developed some isochromatic plates with oxalate, and they retained their red non-actinic colour throughout. He thought that the most important point was the use of tinctures in these processes, so as to secure rapid drying. Possibly the difficulties met with in regard to making alcohol take up the colour were to be overcome. It took up the colour more slowly, and he thought that by a very long digestion in a warm room the object would be obtained.

The proceedings terminated with a vote of thanks to Mr. Clark for his address.

Club excursion for members and friends to Marlow on Saturday, June 25.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting was held on Tuesday, the 7th instant,—The President, Mr. T. S. Yeomans, in the chair.

After routine business, final arrangements were made for the Society's excursion on the following Thursday, after which a paper was read by Dr. MORRISON on *Lenses*, with special reference as to which is the best lens for an amateur to possess.

A discussion afterwards followed, the general verdict being that a rectilinear was the most preferable type of lens.

A vote of thanks was given the lecturer for his paper.

The excursion, the first of the year, took place on the 9th instant to Haddon Hall. Owing perhaps to the President's kindness in offering a special prize for the most original and artistic picture taken on this excursion, a good muster of members and friends was made. The interiors of this old mansion claimed much attention, for some members elected to expose their plates on interiors only, as the wind by this time was high, and exterior work, even without foliage, was extremely difficult. Twelve cameras were at work, and in all one hundred and thirty plates and films were exposed during the day, this being an average of nearly eleven per camera.

MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY

THE monthly meeting of this Society was held on Tuesday, the 14th instant, at the Masonic Hall, Cooper-street,—The President, the Rev. H. J. Palmer, in the chair.

The following were elected members:—Miss E. J. Stanley, Messrs. Thomas Hall, John Lay, and T. W. Markham.

The Council presented a report with regard to the desirability of starting a quarterly magazine or record of the proceedings of the Society, to act as the official organ of the Society, and recommended the formation of a guarantee fund for the purpose, and requested members willing to subscribe to such a magazine to give in their names to the Hon. Secretary.

The several leaders of the outdoor meetings or rambles gave a report of the success of the rambles that have taken place, and particulars of the ones arranged for during this month, namely, to York, Chester, and Alderley.

Mr. GEORGE H. B. WHEELER read a paper on *The Improvement and Retouching of Landscape Negatives*. Mr. Wheeler began by speaking of the great number of negatives that from divers causes, preventable and otherwise, do not print as we wish, and are therefore cast on one side and form a skeleton in the cupboard, to which we often turn with vexation of spirit. These he advised the members to bring out and either end or mend them. Passing briefly the commoner faults of thinness of the image and over density, with their causes and remedies, Mr. Wheeler proceeded to describe the methods employed to improve negatives untouched, and improved prints from which pasted to one mount were handed round for the inspection of the members. The prints showed how over dense portions had by local reduction with chloride of lime been made to print, how by retouching and strengthening the foreground the picture was artistically improved, and how by marking at the back with vegetable parchment (sold for jam-pot covers) worked upon with pencil and stump a negative having extreme light and shade can be improved. Mr. Wheeler exhibited a home-made retouching desk of very simple construction, and, in his remarks on retouching, said that a desk was essential to comfort and good work, that the Paragon Retouching Medium was the best he had tried, and that HB and B pencils are the best to use for landscape negatives.

Mr. S. D. MCKELLEN exhibited and described his patent camera with its newest improvements, including his new focussing screen protector, which does

away with the use of a focussing cloth. This protector can be fitted to any camera, and was much admired. Mr. McKellen also exhibited his patent mechanical rocker and McKellen and Muth's auxiliary view meter and focuser.

At the *conversations* held after the meeting the tables were literally covered with photographs, the result of the Easter and Whitsuntide holidays and the Society's rambles. Prints were exhibited by Messrs. Fildes, J. G. Jones, G. Wheeler, J. Davenport, C. Dawson, W. Berry, J. A. Furnell, Guilford, Smith, Hutchinson, and Whitham.

Correspondence.

Correspondents should never write on both sides of the paper.

A NEW AND NOVEL OBTURATOR.—A POCKET CAMERA ON THE OPERA HAT PRINCIPLE.—A DETECTIVE CAMERA BY M. DARLOT.—M. BARDY ON M. SCOLA'S PREVIOUS COMMUNICATION.—CAMERAS WITHOUT LENSES.—TONING PLATINUM PROOFS.—M. BALAGNY ON REVERSIBLE FILMS.—A CONCOURS AMONG THE MEMBERS.

M. DE LA BAUME PLUNIVEL presented a new obturator, or instantaneous shutter, upon a principle which, I think, has not been seen before, at least in France. I imagine that if it be found good in practice many advantages can be obtained that are impossible with others now in the market. Firstly, extraordinary rapidity; secondly, little or no change in the diaphragm box of the lens; thirdly, a larger opening than any other obturator of equal size; fourthly, a great economy in manufacture. These are the principal advantages I could see in this new idea, that is, if practice will show that it has not a disadvantage which will neutralise all the value of the idea.

Any one can make one for himself. Let him take the large diaphragm of his lens and fit in it another piece of brass exactly of the same thickness. Across the centre of this disc is placed a knitting needle, which is soldered firmly to it; a little thin brass bearing is put on the lower part and another on the top of the hole in the diaphragm in order to fasten the knitting needle, which now forms an axis to the diaphragm. We have now a sort of valve not unlike that of a waterworks company. By turning the top of the axis the disc opens or shuts the hole at will. Now for the disadvantage. When the hole is full open, the axis and the thickness of the disc is always there, and if it does nothing else it hides a certain number of rays, and in consequence dims the light. This line of obstruction, if I may call it so, being in the middle of the lens, is not reproduced on the ground-glass, and therefore its inventor says "it is of no consequence." This remains to be proved. The constructor had attached a kind of racket work to the top of the axis, by which means it can be set for working; it is started off by means of a pneumatic ball, and has certainly a pretty appearance. Many proofs were shown of moving objects taken with this new obturator, and altogether they were as good as the generality of such pictures.

The same gentleman presented a pocket camera, the new feature being that it is very light, the bellows being of silk, held together with the steel springs of an opera hat, and opens and closes in the same manner as that necessary object of wearing apparel. It might cause some annoyance to its owner in these peaceful times of dynamite, &c., as it opens with a certain amount of noise.

M. Darlot, the highly-esteemed optician, presented a detective camera most elaborately got up—in appearance, a gentleman's leather dressing-case. The lens is only uncovered at the proper moment by touching a spring, and the dark slides being in the interior no fear of fog from light need be feared. A sort of camera obscura is placed on or in the top of the box, so that the object to be photographed can be followed and seized at the proper moment; this is done by pulling one of the feet. The instantaneous shutter is thus set at liberty. As it is automatic, no adjustment as regards focus is required. Altogether, a very pleasing and complete apparatus for a tour.

M. Bardy criticised the last communication of M. Scola, and told the members to beware how they placed their confidences in that colouration for their dark rooms. He had examined a piece of glass coloured by the system of M. Scola by the spectroscope, and found its absorbent power of the rays of the spectrum to be far inferior to that of the yellow glasses which can be found on the market; "Except," said he, laughingly, "it be left a certain time to light, when it becomes as transparent as a piece of varnished sheet-iron, such as is used for the ferrotype, which it resembles. The silver nitrate," said he, "changes daily until it becomes as opaque as the piece here before you, which, by-the-by, was left by M. Scola."

Is it not that M. Bardy got hold of a piece of glass coated with gelatine and silver nitrate which had not been put into hyposulphite of soda as soon as the proper colouration had been attained? As preconceived by M. Scola, this continuation of the action of light might then be accounted for.

Some proofs were shown obtained in a camera without a lens, which were very good—exposure varying from fifteen seconds to three minutes. If I remember right, our mutual friend Henderson exhibited some proofs obtained by him to the London and Provincial Photographic Association, stating the size of the hole with which he worked, &c. I bear upon this point as several amateurs here are enraptured with their success, and are bringing it *à la mode* as they say its advantages are numerous, necessarily

under certain conditions. Firstly, no expense for the purchase of a valuable lens; secondly, no fear of its breakage, as well as that of the ground-glass, the latter being wholly discarded, as every object is in focus at the same time; thirdly, a larger angle can be embraced than by the generality of lenses (90°), which permits photographs of objects to be obtained which formerly we hardly hoped for—such as the image of a church in full situated in a narrow street, the interiors of monuments, &c., which can now be obtained by this means, thanks to the rapidity of the gelatino-bromide of silver process; fourthly, which is not its least advantage, no deformation—everything is mathematically correct, thus rendering enlargements possible.

M. Vidal drew the attention of his pupils to the fact that positives obtained upon Eastman's paper could be rendered more permanent and more agreeable to the eye by toning them in a solution of bichloride of platinum.

Water	2000 parts.
Bichloride of platinum	1 part.
Hydrochloric acid	25 parts.

W. Vogel, jun., has experimented, and proposes to plunge the proofs from fifteen to twenty minutes in the following solution:—

Water	1000 parts.
Chloro-platinate of potassium	1 part.
Hydrochloric acid	10 parts.

The proofs are then well washed and placed in a solution of bichloride of copper—fifteen per cent; they are then washed in a solution of alum slightly acidulated with hydrochloric acid. When washed they are ready to be mounted.

I must add that M. Vidal obtained better results with the single bichloride of platinum than with the composed salt as recommended by Herr Vogel.

M. Nadar is enchanted with the formula as given by M. Vidal, which is easy in practice and economic in the long run. I had the pleasure to visit the sanetum of M. Nadar the other day in company with two English photographers, Mr. Protheroe, of Bristol, and Mr. Scamell, of London. M. Nadar showed us some magnificent work obtained upon Eastman's positive paper toned by Vidal's platinum bath.

M. Balagny presented some very fine fatty-ink pictures, which he had obtained from his film negatives. This gentleman made a very long dissertation, the substance of which, as far as I could glean, may be summed up as follows:—Method to render a stripping film suitable for fatty-ink printing—Take a sheet of glass, talc it well, then plunge a sheet of gelatine (such as are easily found in the market) into a tray of water, let it expand for a few minutes, then gather it up upon the talced glass plate and with a squeegee make it adhere to the glass plate. Now take the paper negative, damp it, and lay the image upon the gelatine—the squeegee can be used to obtain a perfect contact. As soon as the whole be dry the paper will peel off the image and the image will leave the glass. We have now obtained a supple film from which can be printed off albumenised proofs, or a contact impression upon bichromated gelatine for fatty-ink impressions.

M. Fabre gave his opinion upon the measuring of the rapidity of rapid shutters.

The Chairman informed the members that it had been decided that a *concours* of photographic proofs should take place among the members, and that different medals should be awarded. PROF. E. STEBBING.

59, Rue des Batignolles, Paris, June 5, 1887.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

To the EDITORS.

GENTLEMEN,—Allow me through your columns to announce that detailed programmes of excursions and local arrangements of the proceedings at Glasgow for the week commencing July 4 are now ready, and will be forwarded on application.

The excursions include visits to the Falls of Clyde, the Troscachs, Loch Lomond, Loch Long, Yacht Regatta at Largs, Loch Fyne, and Edinburgh.

I have pleasure also in announcing that the Hon. the Lord Provost of Glasgow has kindly consented to open the proceedings on the evening of the 4th proximo.—I am, yours, &c., J. J. BRIGNSHAW, Hon. Sec.
128, Southwark-street.

SENSITISING OF AZALIN PLATES.

To the EDITORS.

GENTLEMEN,—Allow me to correct a misunderstanding of yours with regard to the sensitising of azalin plates with ammonia by E. Vogel, jun., of Berlin.

It is not the *restoring* of the sensitiveness of bath plates that Vogel has tried; his experiments were made with the object of *increasing* the sensitiveness of emulsion stained plates which are, as is well known, much slower than bath plates, but more regular and more reliable. These emulsion stained plates have their sensitiveness increased by immersion in a two per cent. solution of ammonia, and are rendered thereby four to five times more sensitive.

This result, Vogel expects, would also be obtained on other kinds of orthochromatic plates.—I am, yours, &c., J. R. Gortz. 19, Buckingham-street, Strand, London, June 20, 1887.

CREAM TINT ON PAPER.

To the EDITORS.

GENTLEMEN,—Referring to your report of the proceedings of the London and Provincial Photographic Association on the 9th instant, I beg to explain that my remark as to a cream colour on Eastman bromide prints was confined to a few samples. I said I had found some Eastman paper to give a creamy tint. As a matter of fact, one packet of a dozen sheets only showed the tint.

I do not know how the tint got there (it puzzled me at the time and puzzles me still), but I should like to see more of it, for it struck me as very pleasing.—I am, yours, &c., ANDREW PRINOLE.

Camera Club, June 17, 1887.

THE RIGHT TO THE NEGATIVE.

To the EDITORS.

GENTLEMEN,—Since Mr. T. Coan, of 50, Cumming-street, Pentonville, N., has done me the honour to notice my letter which appeared in your issue of the 10th, and as he comes forward as the champion to defend and maintain the photographers' right to the portrait negative irrespective of the will of the sitter, perhaps you will allow me to ask of him the favour of answers to the questions my letter contains, and also to give me, consecutively numbered, the reasons he has to justify his claim to that right. These done, I shall, if he wishes, with your permission, discuss the question at issue with him. The ground I take is that so ably stated by your correspondents, "J. F.," Mr. Dutton, and "Mac."

One more remark. I am an economist, and never indulge in anything till I am sure I can afford it. I can give no advice, but I hope, with reference to wit, or an attempt at wit, (red) will take this hint as suggestive.—I am, yours, &c., MILLIE.

Newcastle-on-Tyne, June 18, 1887.

MEDAL AWARDS.

To the EDITORS.

GENTLEMEN,—Mr. Pike's note in your issue for June 17 points so directly to me, that I hasten to assure that gentleman that I am not "No. 8." Now, however, that I am writing, I may state that I greatly endorse the sentiment of "No. 8." in "Exhibitor's" letter.

I think there are many reasons to consider exhibitions and medal awarding unsatisfactory, not the least being the possibility of "wire-pulling," and other work done "behind the scenes" which, with however much "gusto" it may be denied, yet, in many cases, only too palpably exists, and rains down medals on management rather than merit. It is open to question, too, if judges are always capable of judging. From my experience, I know not. I take it, that given technical excellence, the art qualities of a photographer are of greatly the first consideration in approving its merit, and yet nineteen out of every twenty photographers are as innocent of real art knowledge as a new-born babe; they can appreciate photographic art well enough, doubtless—a production often, alas! far divergent from the actual picturesque; its accomplishment is their aim and its achievement brings with it a soothing contentment, quite undisturbed by any exelsior-like qualms as to the "great unexplored beyond."

Then, who shall speak that judges are always above the petty wails so insuperable from frail humanity? I have thought that painters should judge photographs, welcome and nurture its infant art-life for its own art sake, and so lead its votaries into a better knowledge of what to strive for; but I had not counted that an unworthy jealousy would cause them, with their broad, unlimited plains, to grudge the tiny pasturage of the puny photographer, to ungenerously deny their scanty heritage, and trample it down to the lower level of bare photographic merit.

Doubtless, judges are much hampered by the present foolish system of assigning so many awards to portraits, so many to landscapes, and an odd one sometimes thrown in, by the way, for what is really the most meritorious, most difficult, and most possible of artistic achievements embraced in the term genre pictures. Here the parent society shows a very excellent example in sensibly giving the judges a carte blanche, no limitation to class, but only to bestow awards where, in their opinion, sufficient merit justified it.

In this, at least, one wrong is removed, and, all things considered, I think the Photographic Society of Great Britain might rest content that they have adopted the most perfect plan without experimenting or doing away with awards which, I fear, would smack too much of racing without a goal.—I am, yours, &c., LYD. SAWYER.

6, Novaine-road, Newcastle-on-Tyne.

Exchange Column.

Will exchange an interior and exterior background, eight feet square, for similar sizes. Seavey's preferred. With cash adjustment.—Address, M. AUTR, 20, Front-street, Tynemouth.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

DESMOND HILL.—The formula appears perfectly correct.

W. J. BROWN.—Four hundred and eighty grains to the ounce.

A. FREYER EVANS.—We shall be pleased to hear the results of your further experiments.

E. J. HUGHES.—1 and 2. Write to the maker of the plates in question; he will supply the desired information. 3. Yellow glass which is suitable for a dark lantern, will be much too non-actinic for a colour screen in orthochromatic photography.

SAMUEL HOLLINGSWORTH asks for a recipe for tannin plates, which shall be as rapid, or more so, than wet collodion.—Let him use a bromised collodion, eight or ten grains of a bromide salt (say ammonium) in each ounce of collodion; excite in a sixty-grain bath, wash and coat with a solution of tannin fifteen grains to the ounce of water, developing with the usual alkaline developer.

A. S. C.—A good artificial instantaneous light, of great actinic power, is made by mixing together four parts of chlorate of potash, two parts sulphide of antimony, one part of sulphur, and one part of magnesium filings. The ingredients must be reduced to a fine powder before they are mixed together, and the mixing should then be done with a bone spatula on a sheet of paper. If they were to be rubbed together in a mortar a violent explosion might result.

J. B.—The reason of the delicate tones in the carbon prints washing away during the development is no doubt due to the tissue being in a too soluble condition. Remedy: keep it longer before using. It is possible that the trouble may arise from the water employed for mounting the exposed tissue or the glass was not sufficiently cold for the purpose. Its temperature should never exceed 60° Fahr. If it be warmer than this, the temperature should be reduced by the addition of a lump of ice.

HENRY W. BENNETT writes: "I should esteem it a great favour if you could give me a reply to the following in your 'Answers to Correspondents.' I have a lens of the rapid rectilinear type of the following dimensions: Equivalent focus, eight and three-quarter inches; diameter of lenses, one and a quarter inches; focus of front combination, nineteen and a half inches; focus of back combination, fourteen and a half inches; distance between lenses, one and a half inches. 1. Can you tell me from these data what the distance between the lenses should be so that it may work well as a wide angle lens? I intend having a short mount made, so as to use it as such when necessary, to include a wider angle than usual.—2. When using the single combinations of doublet lenses alone for landscapes I find it impossible to get good definition unless a very small diaphragm is used; in the lens in question about 1/16 for the front and 1/8 for the back. Is this due to the lenses being so small in diameter in proportion to their focus (one and a quarter inches diameter, nineteen and a half inches and fourteen and a half inches focus respectively) 1—3. If not, could it be improved by the alteration of the position of the stop when using single lenses alone?—4. When using the single lenses alone would it be better to have a new mount made in which the position of the diaphragm were modified?—5. If so, what would be its best position, or how could I determine it?—6. Could you tell me of a good work on this subject, not too expensive: English, French, or German?"—To the foregoing we give a general reply. The distance at which lenses should be mounted apart depends entirely upon their curvature and not alone on their foci; hence the impossibility of our giving the length for a mount to adapt it for wide angles. But let it be understood that when using any given size plate no alteration of the mount would enable any wider angle to be included on that plate, although it would give a larger circle of illumination and thus permit of the employment of a larger plate. To use a single combination of a doublet successfully, the diaphragm must be removed from the lens to an extent equalling nearly double that required when employed in combination. It will not be necessary to have another mount made if this be borne in mind. Precisely the best position can only be determined by experiment. The best work on photographic optics—indeed, the only one—is that of Monckhoven, published in 1866; but this was prior to the general introduction of lenses of the type you are employing. If you bring the lens to our office we shall be better able to advise.

RECEIVED.—Hinton & Co.'s Photographic Price List.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, June 29, will be on Aids to Exposure. Saturday outing at Lea Bridge. Trains nearest two o'clock from Liverpool-street.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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BACKING PLATES TO PREVENT HALATION.

We are very glad to find some attention being given to a subject which, though one of primo importance, has nevertheless met with but scant attention at the hands of the general body of photographers—we allude to the prevention of "halation." We need not hark back to the days of the dry plates of old when halation and its remedy—backing the plates with some coloured body—was perfectly well known; the effect has been chronic ever since, though brought into greater or less prominence according to circumstances and to the particular kind of plate which happened to receive popular favour. Suffice it to say, it is a familiar enough effect, long ago shown to be caused, in the main, by reflection at the back of the plate of a certain proportion of that portion of the light that formed the image, but was not entirely absorbed by the film. This light would not pass through the film in the unbroken ray it arrived there, but would be scattered in all directions, and, hence, reflected in part, when it arrived at the back surface of the glass, as a halo or cloud roughly following the shape or contours of the illuminated patch of film.

The cause of this reflection cannot be more succinctly described than in the words of Mr. Glazebrook, in his work, *Physical Optics*. He says, "When a wave of light in one medium is incident on the surface of a second and different medium, part of the light is reflected back into the first medium, part is refracted into the second, each according to definite laws."

In the case we are considering the two media are glass and air. The problem is generally considered to be how to get rid of this second medium from between the back of the glass and some substance to be there placed which will not reflect light. When this effect is achieved the particular substance is then said to be in optical contact, and is commonly termed a "backing."

Before entering more fully into the practical aspects of this subject, we take the opportunity of drawing attention to a misapprehension that pervades the common way of looking at this matter, and which is apt to lead to disappointment when the work of negative making with the aid of backing is undertaken. For the entire prevention of the reflection of light upon the film we require a plate of glass with perfectly plane surfaces—the film side and the uncoated side—and, likewise, a substance which is a perfect non-reflector. The surface of the glass of the average dry plate is very far removed from the perfection of planitude, and we are not acquainted with any substance which absorbs every ray of the spectrum.

It therefore follows that, though our plates be provided with a properly applied backing, we cannot in the nature of things

expect that no reflections will come to our film, and that we shall be able to entirely avoid halation, as, to some degree, whatever pigment we place at the back of our plate, and however we plan to have it in optical contact, some reflection must occur.

There cannot be a doubt that the film itself acts as a light diffuser within its own texture, the extent to which this diffusion takes place laterally not having, within our knowledge, formed a subject of investigation. It is extremely probable that its effect is of the very slightest when compared with the reflection at the back of the glass; still, it is a factor in the total amount of light in wrong place. A more important factor it appears to us is the light scattered by irregularities of the surfaces of the film, and of the glass which forms its bed.

If photographs could be with usefulness taken on black glass, these latter defects would be the only ones to interfere with perfect freedom from blur; as, whatever light passed some little depth into the glass, it would be entirely absorbed, and the opportunity of reflection would not occur, except, to a slight extent, at the plane of juncture of film and glass, and here, it is scarcely necessary to observe, it would be absolutely innocuous, if indeed it were not a help.

If, taking a hypothetical case, we could fuse into the glass itself a number of particles of some black body, the effect would be the same as the pigment in optical contact. Again, if the glass were of such a colour as only to allow rays of no actinic power to pass through, no halation would occur, as, though reflection at the back would take place just as usual, it would be reflection of non-hurtful rays. Also if it were possible to obtain a "flashed" glass—that is, a colourless glass with a coloured skin, so to speak—the flashing to be such as would only allow non-actinic rays to pass, we ought to expect absence of halation, and we could then get a practically usable negative by dissolving away the flashing by hydrofluoric acid after the negative was produced. Such a plan, however, for everyday photography is entirely out of the question; but we have a method available, not included in the first scheme of pigment backing we have already spoken of, which we may now describe.

It consists in the substitution for this supposititious "flashing" of a skin of another kind, the details of which were worked out by Captain Abney some years ago. He applied to the back of a glass, and in optical contact with it, a coloured skin which only allowed harmless rays to pass through.

The method of doing this was simply to coat the back of the dry plate with a collodion coloured in such a manner as to carry out the above idea. His plan was to dissolve aurine and roseine in ordinary plain collodion, and then to pour the

coloured liquid on to the plate and allow to dry. The method is both simple and useful; but, bearing in mind the principles governing the reflection of light as described in the first part of this article, we find the light wave in one medium (the glass) to be incident on the surface of a second (the collodion), and so must expect part of the light to be reflected back "according to definite laws." But those definite laws show that if the second medium possess certain qualities, it acts practically as though the two media were a homogeneous whole, and the second then would not be a "different" medium. The action exercised upon light passing through transparent bodies is estimated in the term "index of refraction," and when two bodies whose indices of refraction are identical are in optical contact, they (in the main, though there are subsidiary discrepancies not necessary here to describe) act as though one homogeneous medium. Almost the whole question, therefore, of collodion coating centres upon the index of refraction of the collodion itself. We have no data at hand from which we can ascertain this index, but we should believe it to be very little different from that of glass.

In this survey it will be seen that a choice is offered of many ways of backing a plate to avoid halation; but, as theoretical modes of treating a practical question must always be put to the test of practice, we are able to say that we have been making a large series of experiments as to the best, simplest, and most practical way or ways of performing this operation, and we shall be pleased to give our readers the benefit of our experience and the conclusions we have arrived at in a forthcoming number.

REDUCING NEGATIVES BY MEANS OF CHLORIDE OF LIME.

At the last meeting of the Photographic Society of Philadelphia, Mr. Fassitt is reported to have moralised on the iniquity of publishing "such impracticable recipes" as that given in an article in our last ALMANAC by Mr. H. Hall for a simple process for the reduction of negatives.

In justice to ourselves, no less than to Mr. Hall, we would point out, however, that the recipe is not at all impracticable, but that the failure of Mr. Fassitt is due to his non-acquaintance with the fact that in England, at least, a liquid chloride of lime, or a concentrated solution of the crude salt which passes under that name, is an article of commerce. It is quite possible that such a preparation may be unknown in America; but even if such be the case, one would have thought that upon reading Mr. Hall's instructions, Mr. Fassitt might have suspected that chloride of lime in the liquid form was intended, for the directions are to "dilute ordinary chloride of lime with half its bulk of water."

In the first place, the mixture of a solid substance with water is not "dilution," but "solution;" and in the second, the process that entailed the trouble of accurately estimating the "bulk" of a given quantity of powdered chloride of lime of commerce would scarcely be described from a photographic point of view as a "simple" one. Had it been intended that the crude hypochlorite of lime or "bleaching powder" was to be employed, it would have been directed to mix it with a certain proportion of its "weight" of water, if a definite quantity or volume was not mentioned, for the term "bulk" is seldom or never used chemically in connection with solids. The preparation alluded to in the ALMANAC article is a strong solution of an alkaline hypochlorite, similar in character to Labarraque's solution, Eau de Javelle, and Holmes's Ozone Bleach, but dif-

fering from them in that its base is lime instead of potash or soda.

We make this explanation in order to clear Mr. Hall and ourselves from the unjust charge of causing harm by the publication of impracticable recipes. If Mr. Fassitt himself had applied some little thought to the published formula, he would have been saved the trouble of publishing his condemnation of his own reading of it.

THE Queen's Jubilee has come and past; the *fêtes* in commemoration with the event have all been favoured with the proverbial "Queen's weather." Perhaps at no previous period have so many outdoor subjects been portrayed by photography in a single week as on this occasion. Not only in the great metropolis, but in every provincial town, village, and hamlet there have been rejoicings, mementoes of which have been portrayed by photography, every one of which will be of interest, particularly as time wears on. Had photography been in existence at the time of the last Royal Jubilee, pictures of the procession and other events would now be interesting curiosities as well as commercially valuable. Although the weather was all that could be wished for in London, and cameras of all sizes and shapes, as well as every conceivable form of instantaneous shutters, were brought into requisition, a considerable number of pictures of the royal procession are marred by the flags, bannerettes, and other decorations of the different thoroughfares hiding a large portion of the pageant from view. At very few available points could the whole cavalcade be seen at once, and where it could it was, in the distance, often too indistinct to show in a photograph. This was owing to the haze which prevailed, arising from the dust raised by the vehicles from the sand with which the roads were strewn. Excellent negatives of the local Jubilee *fêtes* have, we learn, been secured in most, if not in all, of the provincial towns and villages.

THE Jubilee may well be reckoned a red letter event amongst photographers, stationers, and printsellers. Those who were fortunate enough to possess negatives of Her Majesty have been busy in supplying impressions therefrom in almost every conceivable style and size. Engraved portraits of the Queen at the time of her coronation, or engravings of the ceremony itself, which a year or two back would only have realised a few shillings, if they found purchasers at all, have recently sold for as many pounds. A large proportion of the portraits sold by the stationers are mechanical prints—Woodburytypes or colotypes—many of them printed abroad. Large orders for colotypes of the Queen we know were some months back sent to Germany for execution. When will England be able to compete with Germany in colotype printing?

HERE is a good story of Jubilee week. Time, after Her Majesty had left London; scene, a quiet West-end street; *dramatis persone*, an Amateur Photographer (who had gone to some expense in decorations) in conversation with friend at next door. Enter to them Itinerant Photographer with quarter-plate "box" camera, bent on photographing the decorations. *I. P.* "If you please, gentlemen, could you tell me the name of the party that lives next door?" *Friend* (winking at *A. P.*). "I don't think you need go there; an amateur photographer lives in the house." *I. P.* "Oh! those are the parties we are most successful with; they likes to have our work as samples what to aim at. Oh! yes; the amateur is not above takin' a lesson." *Friend*. "Well, the gentleman's name is Jones." *I. P.* "Thank you, sir." N.B.—Application was duly made, and after the door had been peremptorily slammed in *Itinerant's* face, *A. P.* (sadly), "I'd like to wring that fellow's neck!"

BICHRIMATE OF POTASH has now become an important salt in connection with photography, and on several occasions we have alluded to its pernicious action on the skin and its poisonous properties generally, but like most persons we were not aware that it was explosive. According to the *Standard* the lamentable catastrophe at Manchester last week was caused by an explosion of bichromate of potash. Other papers have given different substances as the cause of

the disaster, and Messrs. Roberts, Dale, & Co., on whose premises the explosion occurred, state that no explosive materials are made or kept on their premises. Whatever may have been the cause of the mischief, our non-chemical readers who use the salt need not be alarmed, as bichromate of potash has no explosive properties whatever.

MANY of our readers will remember that some seven years or so ago a "Colour Photographic Company" commenced business in a handsome establishment at Knightsbridge, and under very auspicious circumstances, many of the shareholders being influential personages amongst the "upper ten." After about twelve or eighteen months the affair collapsed, as such affairs hitherto have done. When the Company first started, some of the daily papers, as many have done recently, stated that a process had been discovered, and was being worked by the Company, whereby photographs could be taken in natural colours. The directors of the Company, to their credit, at once wrote contradicting the statement, and denying that it was made either with their sanction or knowledge. Such a correction as that would not be out of place now—late as it is—with reference to announcements which have recently appeared in several of our daily contemporaries.

GREAT dissatisfaction is being expressed with regard to the new coins just issued. Whatever may be opinions as to the design, there is no denying that the portrait is very unlike any of the published photographs of Her Majesty. For what reason the portraits on the coins should not be likenesses it is difficult to conceive. It is to be hoped that in the next issue, if there is to be one, that the portrait will be taken from one of the latest photographs.

AN excellent style of mounting and framing gelatino-bromide enlargements is to mount the pictures on linen, in the same manner as engravings are mounted. The linen, sufficiently large to allow of a margin of about three inches round the picture, is strained on a stretcher. It is then covered with fine white paper, and on this the picture, after being neatly trimmed, is mounted. We recently saw a pair of highly finished enlargements on matt surface bromide paper framed in this manner, and they possessed a far more artistic and refined appearance than they would have done had they been in the usual cut-out cardboard mounts. They more resembled good engravings than ordinary photographs.

ANENT the leader *Collodion* versus *Gelatine* last week, it may be mentioned that the wet collodion process still holds its own for many purposes. Photo-lithographers and photo-etchers employ it almost exclusively; so do most persons working photo-mechanical processes, on account of the vigour of the image, and the clearness in the shadows obtainable. Equal qualities in these respects may, however, be secured with gelatine plates, but they must be made specially for the purpose. Such plates will necessarily be very slow as compared with ordinary ones, although they will be much quicker than wet collodion. Excessive rapidity, so much sought after by most artists, is one of the reasons why dry plates are so little employed for the above purposes—clearness of shadows, as a rule, being incompatible with extreme sensitiveness. It might be worth the consideration of dry plate makers, as to whether it would not answer their purpose, commercially, to supply plates specially made for copying—slow ones—say, two or three times, only, as sensitive as wet collodion. Plates of this kind could easily be made, and if they were developed with ferrous oxalate, they should yield shadows quite as bright and clear as those obtained on collodion. A few years back photographers would have gone into ecstasies over dry plates, for ordinary work, which were but two or three times as rapid as wet; surely they will now be content with plates of similar rapidity for copying purposes, provided they could with them obtain as satisfactory results as with collodion.

THE PHOTOGRAPHERS' CONVENTION IN GLASGOW.

As stated last week, the Convention, which opens its week's *séance* on the 4th of July, is destined to be highly successful.

On the evening of the day mentioned, the proceedings will be opened by the Lord Provost of Glasgow. From the subjoined list it will

be seen that excursions have been arranged with great skill, and that these embrace the choice artistic and historical parts of Scotland, at fares surprisingly low. Roughly speaking, the days are to be devoted to sight-seeing, and the evenings to the scientific and literary department of the Convention. Hotels, postal, and telegraphic communications, have all been arranged by the energetic Local Committee. Those desirous of details other than we here subjoin should apply to Mr. J. J. Briginshaw, 128, Southwark-street, London, S.E.

SYNOPSIS OF THE WEEK'S PROCEEDINGS.

MONDAY, JULY 4.

Conversazione at 7.30 o'clock.

The proceedings will be opened by the Hon. the Lord Provost of Glasgow.

TUESDAY, JULY 5.

Excursion to the Falls of Clyde, in charge of Mr. Geo. Bell.

Excursion to the Trossachs, in charge of Mr. T. N. Armstrong.

Evening meeting at 7.30 o'clock.

WEDNESDAY, JULY 6.

Excursion to Loch Lomond and Loch Long, in charge of Mr. John Stuart.

Excursion to the Yacht Regatta at Largs (by special steamer), in charge of Mr. George Mason.

Evening meeting at 7.30 o'clock.

THURSDAY, JULY 7.

Excursion to Tarbert, Loch Fyne, by steamer "Columbia," in charge of Mr. Wm. Lang, jun.

A group of the members will be photographed at Tarbert by Mr. John Stuart.

No evening meeting.

FRIDAY, JULY 8.

Excursion to Edinburgh. On arrival at Edinburgh the party will be taken in charge by the following Edinburgh friends:—Mr. James Crichton, Mr. William Crooke, and Mr. J. M. Turnbull.

Evening meeting at 7.30 o'clock.

SATURDAY, JULY 9.

A photograph will be taken of a group of the members at 10 o'clock, in Kelvingrove Park, West End.

Meeting of the Committee at 11.30 in the Convention Rooms.

DETAILS OF EXCURSIONS.

TUESDAY, JULY 5.

1.—*To the Falls of Clyde, via Hamilton (in charge of Mr. George Bell).*
—By train, leaving Central Station at 7.55, to Hamilton; thence by coach, driving about thirteen miles, to the Falls. Returning from Hamilton at 5.20; arriving back in Glasgow at six o'clock. Fare, for the trip, about 5s. or 6s. Driving from Hamilton, the party passes through the district called the "Orchard of Scotland." The main points of interest on the drive are Cambusnethan House, Garrion Bridge, Dalserf Village and House, Mauldslie Castle, Milton Lockhart, Ruins of Craignethan Castle, the Tillietudlem of *Old Mortality*. The Falls are three in number—Stonebyers, Cora, and Bonnington; these will fully and pleasantly occupy the day, presenting many fine views to the camera.

2.—*To the Trossachs, via Aberfoyle (in charge of Mr. T. N. Armstrong).*
—By train, leaving Queen-street Station, at 8.10, to Aberfoyle; thence by coach, driving about five miles, to Trossachs and Loch Katrine. Returning from Aberfoyle at 3.45; arriving back in Glasgow at 5.30. Return fare to Aberfoyle, 4s. 6d.; coach extra. The party will have several hours to spend among the magnificent scenery at the Trossachs and Loch Katrine. Those who do not wish to go to the Trossachs may walk from Aberfoyle to Loch Ard, the scenery of which is very fine. Boats may be hired on the Loch, or the excursionists may walk round the Loch side. The whole distance round the Loch is twelve or thirteen miles. Most of the stirring incidents in Scott's *Rob Roy* and *Waverley* are represented as having occurred at Aberfoyle and Loch Ard side: as Bailie Nicol Jarvie's encounter with the Highland gillie, the tree where he was suspended in mid-air, &c. If the party should divide at Aberfoyle, some for the Trossachs and some for Loch Ard, they will reunite at Aberfoyle for return to Glasgow.

WEDNESDAY, JULY 6.

1.—*To Loch Lomond and Loch Long (in charge of Mr. John Stuart).*
—By train, leaving Queen-street Station at eight a.m., to Balloch Pier on Loch Lomond, returning from Arrocher by Loch Long at 2.30, arriving back in Glasgow by Craigendoran to Queen-street Station at seven o'clock. Fare, for the trip, about 7s. The railway to Balloch passes Dumbarton Rock and Castle. The steamer from Balloch sails up Loch Lomond, through the magnificent straits of Balmaha to Luss and Tarbet. Those who wish may leave the steamer at Luss, and walk by the Loch

shore to Tarbet, a distance of seven miles. From Tarbet, on Loch Lomond, the party will walk or drive a mile and a half to Arrocher, on Loch Long. This is a fine road, through a lovely and spacious glen. From the Tarbet end of this glen, there is a fine view of "Ben Lomond," and from the Arrocher end the best view of the "Cobbler." The scenery on these two lochs is as grand as any in the world, being a continuous panorama of wooded hill, grassy slope, mountain peak, and precipice. Coming back, the steamer passes through the delightful shore scenery of the Firth of Clyde.

2.—*Excursion by Special Steamer to witness Yacht Regatta at Largs (in charge of Mr. George Mason).*—By train leaving St. Enoch Station at 8.10 to Prince's Pier, Greenock, embarking there in steamer, and sailing to Largs, returning same way, from Prince's Pier at five o'clock, arriving back in Glasgow at 5.50. Fare for the trip, according to number of party, 7s. to 10s. The conductor of the party will fix time and place for going ashore to dine.

THURSDAY, JULY 7.

Excursion by Steamer "Columba" to Tarbert, Loch Fyne (in charge of Mr. William Lang, jun.).—Steamer leaves Glasgow Bridge at seven o'clock, or parties may take the train leaving St. Enoch Station at eight for Greenock, and join the steamer at Prince's Pier. The steamer goes by Kinn, Dunoon, Innellan, Rothesay, and Kyles of Bute, to Tarbert, returning at 1.20, and arriving back in Glasgow with steamer at seven, or by train from Greenock at six o'clock. This excursion is pretty much a whole day's sail—from Glasgow to Tarbert and back, about one hundred and sixty miles—on a favourite and swift saloon steamer, viewing the charming scenery of the Clyde, and spending two hours at the delightfully interesting fishing village of Tarbert. Fares for the trips, 6s.; or including breakfast, dinner, and tea, 12s. This being the only excursion to-day, it has been suggested that a suitable opportunity might be found at Tarbert for photographing a group of the members; arrangements for this purpose have been made with Mr. John Stuart, who will take a photograph of the group on landing at Tarbert.

FRIDAY, JULY 8.

Excursion to Edinburgh, leaving Queen-street Station at 8.45, returning from Edinburgh at five, and arriving back in Glasgow at 6.15. Return fare, 4s.

Offices of the Convention.—London: 128, Southwark-street, S.E.; Glasgow: The Institute of the Fine Arts, 175, Sauchiehall-street.

Railway Stations.—Caledonian Railway, Central Station, Gordon-street; Glasgow and South-Western Railway, St. Enoch-square; North British, Queen-street. All within five minutes' walk of the Convention Rooms.

The Exhibition will be held within the Institute of the Fine Arts, 175, Sauchiehall-street, and will be open daily.

Public Works and Factories.—Should any of the members wish to visit Public Works or Factories, this can be arranged for by giving notice to the Local Secretary.

A list of members attending the Convention will be posted on the Notice Board in the Office and Meeting Rooms. To facilitate the preparation of this list members are requested, on their arrival in Glasgow, to enter their names and where staying on the list at the Secretary's Office. It is hoped that many of the members will find it convenient to be accompanied by their lady friends to the opening meeting and to all the excursions.

LIST OF HOTELS.

St. Enoch Station Hotel.—Single bedroom and attendance, 2s. 6d. to 4s.; double ditto, 3s. 6d. to 6s.; breakfast, 2s. to 3s.

Central Station Hotel.—Single bedroom and attendance, 2s. 6d. to 5s.; double ditto, 5s. to 7s.; breakfast, 2s. to 3s.

The Bath Hotel, 152, Bath-street.—Single bedroom and attendance, 4s.; double ditto, 7s. to 8s.; breakfast, 1s. 6d. to 3s.

Philp's Cockburn Hotel, 141, Bath-street.—Bedroom and attendance, 2s. 6d. to 3s. 6d.; breakfast, 1s. 6d. to 2s. 6d.

Alexandra Hotel, 148, Bath-street.—Single bedroom and attendance, 2s. 6d. to 3s.; double ditto, 3s. to 4s.; breakfast, 1s. 6d. to 2s. 6d.

Granston's Waverley Temperance Hotel, 172, Sauchiehall-street.—Single bedroom, one person, 1s. 6d.; two persons, 2s.; double ditto, two persons, 2s. 6d.; more than two persons, 1s. each; boots and service, each person, 1s.; breakfast, 1s. 3d. to 2s.

The two Station Hotels are five minutes' walk of Convention Rooms, all the others are close by the Rooms.

ECHOES FROM THE SOCIETIES.

DURING the past few years, indeed, since the very first introduction of the process, platinotype has been steadily gaining in popular favour, not so much on account of the permanency of its results as by reason of their purely artistic quality. But like every other process, more or less, it undoubtedly requires a particular character of negative to give the best possible results; this condition being complied with, and the subject being one which the matt surface and rich black tone suit,

a fine platinotype will no doubt compare favourably with any style of picture in monochrome that exists. But a platinotype from an unsuitable or inferior negative is one of the sorriest of objects and appears to decided disadvantage when placed side by side with an inferior silver print. What, then, does Mr. T. Sebastian Davis mean by saying, as he did before the Photographic Society, that platinotype and silver prints were found to advantageously set each other off when placed side by side at exhibitions?

As a member of the Council and of the Hanging Committee of the Parent Society for many years, Mr. Davis may be supposed to know something of exhibitions and of the ideas which guide the officials in placing the works on the walls; but if it be a leading principle that the contrast of styles of printing conduces to the natural advantage of the pictures contrasted, it is a wonder, to say the least, that the Royal Academicians have not hitherto discovered the fact and acted on it by mixing up indiscriminately oil and water colours, drawings in black and white, and architectural plans. For instance, how the late Mr. Street's drawings of the New Law Courts, say, and one of Alma-Tadema's classical studies would have "set one another off" if placed side by side! And what a magnificent "foil" one of Perugini's exquisitely humorous studies would make for one of Du Maurier's originals for a cut in *Punch*! Then the idea might be stretched further by the admission of photographs; and the work of Mendelssohn, Lafayette, Bedford, England, and others, placed in contrast with that of Millais, Oulless, B. W. Leader, Keeley, Halleswell, and Peter Graham. Oh, come the happy day!

As a matter of personal recollection, I have at the present moment in my mind's eye an exhibition of some five or six years ago, in which were a couple of series of prints from the same negatives in silver and platinotype respectively. I had seen and admired privately, though separately, prints in both styles, but when they were hung, or rather framed, side by side, the mutual "setting off" was so manifestly to the disadvantage of both that the exhibitor could not fail to be, as he actually was, ashamed of his experiment. And this, be it noted, was with good specimens of each style. Possibly if an inferior silver print have as its foil a still worse platinotype, or *vice versa*, the former may be the gainer, but that can scarcely be called "setting one another off."

There seems to be a misapplication of terms or a confusion of ideas in the suggestion of Mr. F. W. Cox at a meeting of the London and Provincial Photographic Association, where he is reported to have inquired whether the results from paper negatives were not "flatter" than those from glass, proceeding to remark that he had never seen a paper negative that gave "good stereoscopic effect." There does not seem to me to be much connection between flatness in the sense implied in the question and the flatness which signifies absence of relief.

The members of the Association appear to have been exercised in their minds at the same meeting on the subject of a supposed libel upon English photographers, perpetrated by Mr. W. K. Burton in New York. The truth or otherwise of the alleged statement that English photographers were more chary of imparting information than Americans is scarcely worth discussing. The question is, What did the accused say? My theory for the defence is this. We have a dinner, a guest, and the inevitable speech; dinner good, hosts enthusiastic, guest postprandially happy and wishful to be complimentary, speech delivered with the careless effusiveness usual to such occasions. On the other hand, hosts doing honour to the embodiment of a name well known, drink in eagerly what falls from the fount of wisdom, only too glad if it be complimentary to themselves or their great nation. Can it be wondered at—human nature being what it is—that crumbs of comfort should increase, that the minute seed should swell, and burst, and grow, and produce the fruit so unlike its early promise? We have all heard the story of the "three black crows," and therefore, gentlemen of the jury, I appeal to you to return your unanimous verdict for the defendant.

The ways of modern "meetingdom" are essentially unlike those of the past, and the poor old "Parent" is the only relic that I am acquainted with that connects us with a dead barbarism. We are not now tied to the dry and musty technical details of our art-science as we used to be, but a feeling of friendliness and sociability pervades the atmosphere; and even at those meetings where the soothing pipe

and cheering glass are not *en règle*, it is quite permissible to smile "good evening" across the room to a distant friend, or even on specially festive occasions to venture upon a joke, if there be a *bond fide* opening for it.

The readers of THE BRITISH JOURNAL OF PHOTOGRAPHY are acquainted with Mr. A. Cowan as a thoroughly practical man in all he undertakes; those who are in the habit of attending London photographic meetings know him also as the possessor of a fund of humour, upon which he is ready to draw at a moment's notice when required. But it is really cruel to report his sallies in the incomplete manner adopted by the prosaic reporter of the London and Provincial Photographic Association. Robbed of the suggestive inflection of voice, and perhaps the slight droop of one eyelid, the accompanying volley of laugh and chaff, a reported joke falls flat indeed, even when made the most of. "The business of a procession is to process," Mr. Cowan is reported to have said; but I for one do not believe he said anything of the sort, for he knows as well as anybody else that its duty is to *proceed*, while every one must have recently experienced the fact that the general result is to make itself a nuisance. The reporter is more successful in his second attempt, when, in reply to Mr. Henderson's statement that he had failed in his attempt to photograph Her Majesty with a Suter lens, Mr. Cowan surmised that "the lens did not suit her."

As an example of a truly fruitless discussion, I cannot help referring to a recent meeting of the Bury Photographic and Arts Club; not that the subject was a useless or unsuitable one to bring before the society, but simply because of the unsatisfactory character of the data. A print which had faded nearly out was alleged to have "been thoroughly washed and mounted with a reliable mountant," and, moreover, to have been "kept in a dry place." It would, under the circumstances, have been difficult to find any other cause for the result, and therefore the *mount* was made the scapegoat. But the questions arise in, What is "thorough washing?" What is a "reliable mountant?" and, What is a "dry place?" and, further, Who guarantees the conditions in this particular instance? I am reminded of the examination question, "What would be the result if an irresistible force were brought to bear on an immovable object?"

Mr. Marsh's demonstration of emulsion making before the North Surrey Photographic Society was, no doubt, most interesting, especially as only "a few ordinary household utensils" were brought to bear on an "imaginary emulsion." Emulsion making is the easiest thing in the world in imagination or theory—so for that matter is rifle shooting. But to make an emulsion that will work when made, or to put on a "highest possible" at 800 yards, is far more difficult in actual practice than when working on an "imaginary" emulsion or a "dummy" target. But the game is not finished when the emulsion is made. The plates have to be coated, levelled, and dried, and this part of the process requires quite as much care—of another kind, perhaps—as the emulsion making, and will prove to be far more troublesome and inconvenient to the large majority of amateurs.

By-the-by, what does Mr. Marsh mean by describing "the making of an emulsion by the ammonio-nitrate method, by which the trouble of washing is avoided?" The italics are mine. Is this another instance of incorrect reporting? What, again, was the size of the negatives exhibited, containing only "about a grain of silver in the film of each?" And does this refer to the fixed or unfixed image? If the former, how does Mr. Marsh compute the quantity of silver?

Here is an idea from Philadelphia. Postal cards are sold ready sensitised for the production of ferro-prussiate or "blue" prints. Such cards might prove useful for advertising purposes in this country for disseminating designs in a cheap manner. Nothing is allowed to be attached or pasted to a post card, but there is no law to prevent a photograph being printed instead of stuck on to the card.

MONITOR.

THE MANCHESTER EXHIBITION.

III.

An argentic enlargement, *Portrait of a Lady*, by S. Fry & Co., looks like a fine engraving. No greater praise could be bestowed upon it; but this is a characteristic of a large number of photographs in this Exhibition.

Why does Robert Faulkner designate so many of his works as "portraits on red opal?" This is incorrect: they are on *white* opal, although the material of the pictures is red pigment. If this latitude in nomenclature be permissible, why not speak of red paper or black opal? But "a rose by any other name will smell as sweet," and the considerable number of Faulkner's exhibits sustain his reputation. Abel Lewis, L. Berry, and William Croke, are extensive exhibitors of work mainly of a high class; but a portrait by the last-mentioned in "red opal" is not equal to his platinotypes, which are much above the average. J. H. Hogg, in addition to some good platinotypes, goes in also for red portraits in Faulkner's style. Wonderfully good is a bromide enlargement of a girl and dog, by J. Ingham, although in this and in quite a number of cases by other artists we are left in doubt as to whether the enlargement was made by the exhibitor or not.

W. J. Byne contributes a collection of portraits taken in his best style. The well-known names of Vernon Heath and William Bedford are among the exhibitors, their works consisting of landscapes, those of Mr. Bedford being scenes in North Wales.

We have here an opportunity of comparing the ceramic enamels of Count Ostoróg (Walery) and A. L. Henderson and ascertaining their relative merits, as their exhibits are hanging side by side. Until we saw it on Walery's frame, we were unaware that he worked by a patent process. If it is one that has been patented in this country, we have quite overlooked it, nor have we yet been able to find it in our Patent Office archives.

Hanging in the portion of the Exhibition among the outsiders, are some works by local artists, among whom are Warwick Brookes, who has a large collection of portraits of admirable quality, and A. Brothers, whose picture, *Resignation*, is a very fine carbon photograph.

Quite imposing in their grand repose are the enlarged photographs of some of the wild animals in the London Zoological Gardens by Dixon & Son; and imposing, too, is a fine bromide enlargement of the west front of Rouen Cathedral by Rev. H. J. Palmer, who, however, exhibits several other works of equal merit.

We are glad to perceive on the walls, and effectively displayed, Mayland's grand picture, *There is Sorrow on the Sea*. We find also a number of highly attractive landscapes and other scenes by Matthew Whiting, with a frame of interiors by Bedford Lemere. The contributions of the members of the Manchester Societies, as might be expected, are both numerous and of excellent quality in the main. But our space at present necessitates deferring a notice of them till next week.

COLOURING AS APPLIED TO PHOTOGRAPHY.

We are now in an age when hopeful minds and even speculative companies are straining every nerve to discover an easy method of arriving at a coloured photograph. Those artists who have for years given their best services to help the photographer in this branch, however, may peacefully carry on their pursuits unworried by the blatant cries of a few interested people, who declare they have mastered the secrets of nature so far as to be able to produce a photograph in natural colours. There have been many such wild reports sent abroad, but whenever any one wanted a photograph coloured the photographer has always had to call in the aid of an artist for the purpose. He found photography, pure and simple, incompetent to help him through his trouble.

It is now more than a hundred years ago since photography showed first signs of life. I believe it was about 1777 that the first germ of photography was discovered by Scheele. I have not the least doubt, too, that he then never thought that photography would hold the position it has to-day. It was fully fifty years after this date that this same germ, in the hands of Talbot, Daguerre, and Niépce, gave signs of life. Under their careful and skilful treatment photography proper may be said to have made its *début*. The advancing strides of photography since those days have been not only rapid but amazing, until to-day it assumes the position almost of a distinct art. Photography might not inaptly be compared to a mighty tree with numerous and healthy outspreading branches. It is to one of these branches that our attention is being directed.

Notwithstanding the supposed existence of "photography in natural

colours," I will venture upon saying that up to the present, at least, photography has only furnished us with the image of an object with its light and shade, but *without* its natural colouring. There is little doubt, too, in the minds of men who *ought* to know, that this state of affairs is very likely to last for a considerable time in the future. Whether any method or system will ever be discovered by which the natural and distinctive colours of the various objects will be reproduced *by chemical means solely*, may be safely left for the dim future to determine. Up to the present time painting has had to supply this effect.

Form must necessarily be the basis of all art, but in many cases colour is almost as necessary if a true portrait be the object in view. There is no class of painting which exercises the mind of an intelligent artist more than does portraiture. There are very few now (but there are a *few* even now) who believe in the unerring truthfulness of a photograph to reproduce nature as nature really is. As I say, there are a few who still hold the opinion that a really *good* photograph is one of, if not absolutely, *the* greatest triumphs of art. The believers in this theory should not read further, but to those who do not believe in it the following may prove interesting, and perhaps instructive.

It will be well to constantly keep in view that we are strictly treating upon *portraiture*, as, of course, many of the conditions laid down would not equally apply to other branches of photography. To produce a portrait with any degree of truthfulness or artistic merit, it *must* be *natural*, but it does not follow that everything that *is natural* will necessarily be a *portrait*. Nature in *all* her aspects is not beautiful, but in making a portrait of her we should select such as will show her to the best advantage. We have all, no doubt, seen the instantaneous photographs of horses, showing them in the most absurd positions, devoid of all grace and beauty; surely if we were to paint a portrait of one we would not select such a position, notwithstanding that it was natural. No, we always select one where the animal looks to most advantage and shows its many *points* of beauty. As it would be with horses or animals generally, so it is with the human kind. There is a goodly amount of the ugly about us. We are naturally very beautiful, I will agree, but we could, if we tried, find some ugly *points* if we cared to bring them into prominence. Even if, in the reckless wish to be above all things natural, we were to select our ugliest and worst aspects, it would not add to the value of the picture as a portrait, but would considerably mar its claims to be considered a successful reproduction of nature.

Man, as an artist's model, is an ever-shifting subject, presenting an endless variety of ever-changing aspects of light and shade, most of which no artist could select for a portrait, and yet they are all most natural. To paint a successful portrait means much more than to simply secure on paper or canvas the copy of what is natural. Other elements have to be considered. Intellect and beauty must receive due attention at the artists' hands. Why is one operator more successful in the studio than another? Simply because he is endowed to a greater extent than his fellows with the power of securing grace and beauty in posing his subjects. It is undoubtedly natural that a person should wink, frown, or grin, or even occasionally loll or stretch himself, but who, with any judgment, would dream of selecting such actions as the leading characteristics of a portrait? These points apply not only to the artist about to paint a portrait, but also to the photographer about to take a sitter.

The aim of every true artist or artistic photographer is, therefore, to portray nature under such conditions and aspects as may best secure the intellectual character of the model, and invest same with a necessary amount of pleasing pictorial effect. In this the painter has a decided and very marked advantage over the photographer, and that advantage is *colour*. The eye of the observer can be led away from some defective or offensive spot by the influence and disposition of colour in a painting, while the photographer is hampered by having only one colour, if I may so call it, at his disposal.

The task before a painter or photographer desirous to obtain a successful *portrait* is anything but easy, and it speaks volumes for many operators the rapidity with which they despatch a sitter, and yet secure a characteristic and pleasing portrait. This fact will be more easily appreciated when it is remembered that Sir Thomas Lawrence and Sir Joshua Reynolds have repeatedly had as many as fifty sittings for a portrait. Now, if this be the case with two of our

most eminent painters, how must it be with the lesser lights. All this, too, in order to secure an expressive position or look best calculated to depict in the painting the character and disposition of the sitter. There is no one, I presume, who can think that all these sittings could be necessary for producing simply accurate drawings of models. Nowadays a great deal of this bother and worry to artist and model alike is obviated. Here photography helps us very considerably indeed. In less than an hour a number of plates can be exposed and afterwards developed, one of which will surely supply all our requirements, thus avoiding loss of time to all concerned, and in many cases serious expense to the sitter.

In the question of *expression* the painter has again the advantage. He may secure it in the course of an animated conversation, being able to allow the sitter every liberty. Thus he will catch the intellectual expression, which will give life to the picture and be the essence of the portrait. On the photographer's side is that death blow to expression, "Be still, please—I am going to expose!" The "look pleasant" so often expressed has seldom, if ever, a response on the part of the sitter. There is so much method about everything that the model is more likely than not to assume an expression quite foreign to him and so detract from the chances of his picture (no matter how good a photograph it may be) ever being a good and successful portrait.

The photographer who does not care to study the artistic bearings of portraiture is more likely to produce what may, not inaptly, be styled a map of the face. This, however, may be very far from being a portrait in the true sense. Retouching may or may not improve the state of affairs, depending upon the artistic training of the retoucher to whom the negatives may be given.

A happy accident, even in the hands of the most ignorant, I have known to achieve the most successful results; but, as I say, it was pure accident, and a similar result would never again be arrived at except by a recurrence of the accident. For this a photographer must not hope, and unless he studies and cultivates his artistic knowledge he can never hope to produce uniformly successful results. A photographer always finds it a great sorrow to give up his pet notion, that to succeed he has only to depict nature, reserving to himself the firm belief that a really good photograph is necessarily a faithful reproduction of the same as she is seen by the eye.

This, however, is a fallacy. In many cases the very best productions of the camera and lens, unaided by art, is anything but a truthful transcript of nature. The very principles of photography, chemical and optical, unite in rendering this inevitable. The photogenic action of the various colours, some possessing it to an extreme extent while others have it scarcely at all, from a chemical point, while the undue enlarging and diminishing of advancing and retiring objects, from a mechanical, combine to remove photography further from being a truthful reproducer of nature than many believe painting to be. Art will soften the peculiarities, if offensive, while photography very often will exaggerate them. The incipient wrinkle or insignificant scar, which in nature is scarcely observable owing to the brilliancy of the complexion, or the delicate freckle, which to the eye is lost in the general tint of the skin, form no defective points in the artist's portrait; but submit them to the cyclopean eye of the camera, and you will have them brought out in all offensiveness in the black and white of the photographer's photograph. Red or golden tresses, too, might just as well be black as the raven's wing for all photography cares. Give such a subject a blue eye, and where will be the balance and truth to nature of the photograph? In such cases is it that a photographer finds colour his only friend, and flies to him for help.

It is a principle in art, as regards portraiture, that all importance should be given to the head, the rest of the picture being quite subordinate. This, too, is true to nature, for how often will you see people and remember their faces, yet be quite unable to tell how they were dressed. Photography, however, knows not these delicate distinctions, every button, fold, and even the very texture of the material, is brought out with amazing distinctness. All this, in most cases, detracts very considerably from the prominence of the head, and often even reduces it to a mere detail.

In thus referring to the unavoidable defects in photography, I do not wish to depreciate photography, only to point out the advantages

in its artistic application. Let the photographer, like the colourist, study the works of the great masters in painting; what the latter gains in knowledge of colour the former will more than equal as regards position, disposition of drapery, light and shade. Portraiture produced under the best conditions of photography, guided by art, will not only be worthy of the best efforts of the colourist, but may even rival the best miniatures when skilfully finished.

REDMOND BARRETT.

(To be continued.)

FINISHING PHOTOGRAPHS.

FEW will dispute that much of the beauty of the photograph depends on the manner in which it is finished. Finishing is here intended to be an inclusive term, applying to any and every means by which improvements can be effected in either negative or prints. The finest negative may be easily ruined by injudicious doctoring, or the most beautiful print rendered commonplace by the way it is either trimmed or mounted; so much depends on the final processes to which either one or the other is subjected. In the following remarks it is intended to glance at the various plans that have been adopted to improve our work, and, given a good negative, to get the best possible results from it. In the first place, the most careful attention must be given to the negative, whether portrait or landscape. To permit of a proper judgment it is absolutely necessary to take an impression before any alteration whatever is made prior to varnishing. In doing this, great care must be taken that both negative and paper are thoroughly dry, or a piece of talc may be interposed between the two if the weather happens to be moist, damp, and cold, or in all probability the film will become spotted with silver and much damaged, if not altogether ruined.

As good an impression as possible having been obtained, it is easy to determine what alteration can and may be made in the negative before it is put out for regular printing. In all probability some parts will be better for shading by the application of tracing paper or coloured varnish to the back of the negative in those places that print too dark. Some portions also will require reducing, either by rubbing down with spirit or scraping. Specks of white, or even unimportant small white objects, when they occur in a mass of shadow or darker portion of the negative, are better removed altogether by picking out with a needle or sharp knife point, such white specks being very detrimental to the masses of shadows, and far better removed from the negative at this stage than afterwards by colour on each print. Inequalities in the film may be now in a great measure remedied by the application of blacklead with a stump or finger's end over the too darkly printing portions. If the negatives are somewhat deficient in pluck the blacklead pencil will, by accentuating the high lights on buildings and prominent objects, wonderfully brighten it up, apparently increasing the scale of tone and depth of the shadows; in some cases a little water colour, judiciously applied, will be better than lead pencil, having rather more power of covering, but it must be used with discretion, too much being more objectionable than none at all, a white mark on a photograph being generally more conspicuous than a dark one.

The negative having been improved as much as possible by these means, it is better varnished, not only to protect the film but to prevent the improvements rubbing off; a line may be ruled round the negative with black varnish as a guide to laying on the paper in printing, and the name and number attached. The negative is now ready for the printer. The first few proofs should be examined to ascertain if the alterations made are right, and modifications made if required. Afterwards the finishing will be confined to the print itself, and the first thing to do is to decide on the shape—square, oval, or whatever may be thought to suit the subject best, the *shape* very much influencing the pictorial effect. To get at this it is advisable to have a number of masks of different forms to lay over a print, which is the best help to forming a judgment. One being selected, it must be slightly attached by gum at the corner to the negative to prevent shifting in printing.

The print on its removal from the press will have, or ought to have, a pure white margin, which is better slightly tinted down by covering the subject and exposing the margin a short time to

diffused light. Clouds, if required, must now be added; the print is then ready for toning and fixing.

With regard to vignetting, a favourite and decidedly artistic method of treating the print, there are several styles of doing it. The most usual is merely softening off the edges of the subject into the margin, and may be with a long graduation or more abrupt one. The abrupt style is very popular at the present time, and consists of nothing more than softening the edge of the masked prints to the extent of an eighth of an inch or so, a sort of intermediate style between the sharp edge and vignette proper; by this means a larger picture is secured than if the print has wide, graduated edges, but the delicate beauty of a good vignette is quite lost. This style is principally used for landscape. Another, and effective, method of vignetting is by sharply masking the upper portion and one side of the picture and softening off the rest—a plan now largely used in artistically illustrating books, and the effect is extremely pleasing; no better guide could be found than a careful examination of these engravings. Unfortunately, most landscapes require taking with special reference to this method of vignetting; an ordinary landscape, no matter how excellent for ordinary printing, will probably lack the framing, as it were, of branches and foliage that form so striking and effective a finish to the vignettes. The only available plan is to photograph a series of marginal foregrounds suitable, and combine them with the landscape by double printing—no very difficult task to any photographer of artistic instincts. To give a hint to those who have not tried the combination of double printing and vignetting, the course to be pursued is as follows:—Mask the landscape negative with the desired shape on the two or three sides, and vignette the unshielded side or sides in the ordinary way, the mask being slightly attached to the *paper* and removed with it. The negative of the marginal foreground, previously prepared by stopping out all the subject not required with black varnish, is held up to the light, the landscape, already printed and with mask attached, is adjusted upon it, carefully placed in the printing frame, and this again vignettted in the usual way. If it has all been properly managed the result is very charming. It need scarcely be said that artistic judgment must be brought to bear, and the result as a success or failure will entirely depend on the worker. This method of vignetting has not yet been much used, and opens up a field for picture making more novel than most, and, at the same time, is a good test of the photographer's artistic ability.

For ordinary vignetting, a toothed opening of a suitable shape cut in a sheet of blackened card or zinc and laid at a little distance over the printing frame, is about as good a plan as any. The vignetting glass abominations consisting of flashed orange glass, with the colour ground off to shape in the middle, do occasionally produce fair results, but generally give an egg-shaped or smooth-edged vignette anything but artistic. All vignetting should be either done in diffused light or under frames covered with white paper or ground-glass and printed in sunshine. For large pictures, a frame of card or wood laid over the printing frame, under the edges of which cotton wool has been tucked, is a favourite plan with some and excellent results are obtainable.

Portraits can be finished in several styles quite unsuitable for landscape. The vignetting may be effected in the same manner as for landscapes, or they may be vignettted into black backgrounds (a Russian plan that found some favour a few years ago), or they may be shaded, whilst the margin is tinted deep as the middle tints in the picture. Another plan is to print the portrait in an oval, then mask it and put a suitable landscape *very faintly* on the margin; a diaper pattern may be substituted for the landscape if preferred, but whatever it is the impression must be very light. Printing natural backgrounds to portraits is, I think, a specially artistic plan of treating photographs. A very few precautions are necessary to success. In the first place, the background must be rather light, shaded darker towards the bottom. The foreground must be regularly built up with rocks and plants, and which will, of course, be taken with the sitter. A print having been taken in the ordinary way, no masking being required, the light portions of the print are painted over thickly with gamboge and allowed to dry, when they are laid on suitable landscapes and printed. The colouring matter washes off without leaving any mark, and the shading of the background causes the whole to harmonise. The results, when properly done, are simply perfection.

Most small work is highly glazed either by burnishing or enamelling.

The effect in appearance is similar, but enamelled prints are much more permanent, if more trouble to make. An enamelled print may be rendered matt by rolling it through a press in contact with a finely grained surface. Whatever the pattern or grain on the plate it is reproduced on the enamel. Masks rendering the margins dull, or impressing a pattern without touching the portrait, is rather an effective method of finish. Embossing, in conjunction with this, has a good effect. For larger pictures, either portrait or landscape, cementing them to colourless glass with gelatine is a favourite method, as it certainly improves the looks of the photograph very greatly, but it is imperative to use only colourless glass, or a sickly greenish look is imparted, spoiling everything. The manner of mounting and the colour of the mounts have much influence on the photograph, also the decorations thereon frequently displayed. It is a moot question, from an artistic point of view, if the surroundings of a picture should be otherwise than quite plain. Many prefer a mount without even a simple line, the whole being treated as severely as possible, with the idea that anything that attracts attention in the slightest degree is detrimental to the picture. On a point where so many eminent authorities agree to differ, it may be fairly left to the photographer to use his own discretion. My own opinion is, that so long as the ornamentation is subdued and retiring, I see no objection to it in moderation. A plain line has the effect of binding the picture together; preferably it should be rather light in colour, certainly not black, and in many cases a marked improvement is the result. In pictures, for instance, where patches of light and shade end abruptly at the margin, with no connecting subject, a plainly mounted photograph looks bare and unfinished, a line round sets it right. The distance of the line from the print and the colour of it have considerable influence. Most photographs look best if a brown line is ruled about half or three-quarters of an inch from the subject.

Of all methods of mounting landscapes or large portraits, I give the preference to India paper laid down on white board, with a rather deep plate-mark, half an inch or so of the India paper showing at the margin of the print. This plan has a refined and finished appearance, and is suitable for all kinds of photographs. There are many other ways of finishing to which I have not alluded, inclusive of framing, which, to judge by the extraordinary and bizarre specimens we have of late years seen at our picture exhibitions, would indicate a very wide field for experiment. A safe rule for our guidance in this department is, that whatever the frame may be, let it be plain and good.

EDWARD DUNMORE.

HOW TO PREPARE GELATINE "POSITIVE" DRY PLATES.

ONLY about nine years have elapsed since gelatine dry plates displaced wet collodion for negatives, and great hopes were entertained, not only that gelatine would outlive collodion for negatives, but that the primitive dia-positive and ferrotype might be achieved by the modern dry plate process. And now it is admitted by competent authority that this anticipation has been realised, and with your permission I will briefly detail the course of experiments taken to achieve their successful preparation.

Some two years ago I had occasion to devote some time to laboratory chemical practice, and seeing some experiments made with hydrogen-peroxide on silver nitrate, I was induced to apply this agent to silver bromide, with the expectation of getting a white deposit on a gelatine plate, and to my satisfaction my anticipation was realised.

But of course much modification was needed to qualify the film for a proportionate deposit according to the varied intensity of the light. The simple application of the H_2O_2 either to the emulsion or developer did not suffice to bring about this desired effect.

From the appearance presented in the film, it occurred to me that the energy was too intense, though in the right direction, and I found that by diluting the hydrogen-peroxide with water, or allowing the bottle to stand uncorked, so that it lost part of its oxygen, the desired effect of relative deposit according to degree of intensity of light was effected. Much, however, had to be done to bring the process within the range of everyday practice, and it is only after a space of two years' intermittent experiment that a commercial value has been given to the gelatine glass positive and ferrotype.

For the sake of brevity we may dispense with detailing the original work for their preparation attempted two years ago, and proceed to give an account of the course taken to improve the uniformity of

the white film and increased rapidity in development. The great difficulty to be overcome was this uncertainty of whiteness, coupled with too much time occupied in development; the degree of whiteness depended essentially on the quantity of pyro used, and the less pyro used the longer development was required to get the result, which was much whiter than if more pyro were used. Without attending to this, nothing but a dull, leaden grey colour could be obtained, and this in a great degree prevented their commercial use, as was evidenced by the unsuccessful attempt to introduce them in America. Stimulated by seeing the agitation for them in America I thought it worth while attempting to improve them. The methods employed are, perhaps, worth recording here. Knowing as already stated that H_2O_2 alone would not suffice to give uniform whiteness without occupying too much time in development, it was necessary to find a means to accelerate development and preserve the tendency in the film to give a better white, and I found the yellow tint predominant to be due in a great measure to lack of chemical energy and prolonged development. Anticipating that it was the film that needed humouring to suit the developer, I applied sodic sulphite in an infinitesimal quantity to the emulsion after washing, and in considerable quantity to the ammonia developer, also some hydrogen carbonate of sodium; these ingredients gave the desired effect. Many experiments, however, were tried before the effectual one was arrived at.

A considerable variety of the fixed alkalis having been tried, the weaker ones showing best the direction most hopeful of attaining the object in view, this is perhaps contrary to saying that more intense chemical action was needed to get better whiteness. My reason for supposing this is supported by experiments made with different strengths of developers, also different degrees of emulsification. It was found that weak ammonia solution gave a greenish white when emulsification was carried to the maximum, and if sodic sulphite carbonate or bicarbonate were used nothing but a bright green could be got. Probably the colour is not attributable to intensity of chemical energy, but rather to the tendency of the different reducing agents to give a different isomeric character to the reduced molecule, which no doubt determines the colour. This must be taken as an amendment or limitation to the principle enunciated above, that the desired result was due to the intensity of chemical energy.

Whatever theory one may invent for a groove to practise in, ample scope should be allowed for error, because often preconceived notions are altered by a mere detail. For example, we see that practice shows that a strong developer was not the giver of the best white, but rather the mixed effects of ammonia and the weaker fixed alkalis combined with a modified emulsion. However, we see from this that the result has been arrived at not by rule of thumb but by noting the chemical actions of different reducing agents tending to give a white film. And in conclusion of this paper, intending to convey an idea of the methods pursued in finding the new departure, it may be worth adding that at last I have found that one of the ingredients can be dispensed with, and with the advantage of giving a uniformly better white; in fact, if the developer be properly regulated only a very slight change from an ordinary emulsion is needed. And in continuation of this paper I propose to give the formula and methods of preparation and manipulation. The tintype and dia-positive business is at present but little practised, but let us hope that at no remote date an agitation for this now minor adjunct in photography may crop up. Were such a time coming, a demand for dry ferro or glass positive dry plates must ensue. Therefore an excuse for occupying your valuable space by such a minor contribution may be acceptable, on the ground that the recording of such experience may be of service to those it may concern at a future time.

JOSEPH GRAY.

PHOTOGRAPHIC INDUSTRIES.

McKELLEN'S CAMERA FACTORY.

THAT Manchester has exercised a powerful influence on the engineering of the world, especially as regards precision of measuring appliances, is well known and fully recognised by every mechanic; and that it is exercising a potent influence on the cameras, more especially those of the portable class of landscape instruments, is now being equally well known to photographers.

The latest addition to the editorial collection of cameras of this class, and one which is greatly prized on account of its compactness, lightness, rigidity, and excellent fitting and finish throughout, being one which emanated from a maker whom we, rightly or wrongly, regard as the founder of the modern Manchester school of cameras, Mr. S. D. McKellen, we took advantage of a hurried visit to the great Cotton Metropolis Jubilee Exhibition to pay an equally hurried visit to the McKellen camera factory.

Having graduated in a watchmaking school—perhaps of all

mechanical institutes that which evokes the mechanical and inventive faculty more highly than any others—small thanks to Mr. McKellen that he is not only ingenious in conception but is able to carry his conceptions into practical execution. What we are glad of, however, is this, that being a photographer he has allowed the black art to influence his inventive and constructive faculties to an extent which renders photographers the gainers. With perhaps pardonable pride he can point to the fact that the only medal ever awarded hitherto by the Photographic Society of Great Britain for cameras was given to him, and we suppose he must feel it as a compliment that others in this line of business are imitating him as closely as the patent laws will permit.

There is no need for us here to descant on the characteristics of the McKellen camera, as these are already well known to our readers, either by description in these pages or by practical acquaintance with the article itself. What we purpose speaking about is the place, as we witnessed it in operation, where the McKellen cameras and other apparatus are made.

The factory is situated in a street within a mile or so of the office or sale room in Spring-gardens, near the centre of Manchester, if the huge city can be said to have any centre. It is composed of two buildings connected with each other by means of a gangway, which passes over a lumber yard beneath, the large entrance gate to which bears the name and purpose of the factory within in terms so large and emblazoned that he "who runs may read." In the timber store department we saw many samples of choice mahogany so thoroughly dry, so far as we could judge, that one may have conceived them to have done duty as bedsteads or other domestic appliances since the times of Queen Elizabeth. Drying racks are also erected on the ground floor in proximity to a gas engine which drives the machinery of the factory.

One room is devoted to the manufacture of dark slides and roller slides; another to the cameras themselves. We were shown thin morocco skins specially prepared for bellows bodies, these being for an outside covering of the more substantial opaque textile fabric which forms a substratum for this important part of the camera. In the McKellen camera and legs there are, exclusive of the ordinary wood screws, over one hundred pieces of brass, all made for their special purpose, and each one of which has to be fitted by hand. There must, therefore, always be a large amount of handwork in the camera.

Mr. McKellen, however, has in use a number of ingenious wood-working machines and cutters, all of his own designing, driven by a fine four-horse Otto gas engine; and with a view to a more rapid execution of his orders, which up to the present time have far exceeded the capacity of the works to keep pace with, he has made arrangements for further extension of the labour-saving principle. And amongst the most recent of the machines for that purpose we saw in operation elsewhere a planing machine—which is about to be transferred to the factory—which planes wood of every degree of thickness and with a degree of precision and smoothness so perfect as to leave the surface in a state requiring but little to fit it for the French polishers. A sandpapering machine, on the American principle, is also to be added to the factory appliances as a labour saver.

There are about thirty-five skilled workmen employed altogether, including workers in both brass and wood.

In his city office warehouse, Mr. McKellen has fitted up a very neat and commodious dark room, where clients and others may change or develop plates, or do any of the thousand and one things that a dark room is very useful for; and we are authorised to say that any photographer, whether a client of the firm or not, may make use of it at any time without charge.

PHOTO-MICROGRAPHS AND MICRO-PHOTOGRAPHS.

SOME time back Dr. R. L. Maddox asked me to hunt up the origin of the word "Photo-micrograph," and as I have succeeded in running it to earth I think it may be as well to place it on record.

In *The Photographer* (a manuscript photographic journal), conducted by J. Traill Taylor, printed in the then named *Liverpool and Manchester Photographic Journal* (now *THE BRITISH JOURNAL OF PHOTOGRAPHY*) for August 15, 1858, pages 203 and 414, also in Sutton's *Photographic Notes*, vol. iii., 1858, pages 205, 208.

Page 205, J. T. Taylor writes:—"By the way, will Mr. Shadbolt (who is an authority in microscopy) or any one else kindly suggest a suitable name for such magnified pictures? 'Micro-photograph' won't do, because that name has been given to the reduced pictures."

Page 208, George Shadbolt replies:—"The word micro-photograph originated, I believe, with myself, and is applied, I think, correctly to very small photographs, not to photographs of small objects, which would more correctly be 'photo-micrographs;' but probably a con-

venient word for this class of subjects, as well as for enlarged copies generally, would be mega-photograph."

The word "photo-micrography" is certainly a good test for a public speaker, and I have vivid recollections of struggles with it on my own and other persons behalf. I think, however, with Dr. Maddox, that custom has established it too firmly to permit of its replacement by something more harmonious and easy flowing. I should like, however, to call attention to Mr. Shadbolt's excellent word "mega-photograph;" it seems to me that this would be much better than the term "enlargement."

W. JEROME HARRISON.

WHERE TO GO WITH THE CAMERA A TINY TOUR.

A 7½ × 5 CAMERA; a 9 × 7 Steinheil lens; three double backs garrisoned with instantaneous plates; a focussing cloth; a tripod head; a camera screw. These comfortably filled a stout canvas case, which was furnished with a sufficient length of strap to admit of the whole being slung round the shoulders and shifted from side to side as occasion or convenience required. The stand was of the customary pattern, and portable enough to be grasped by the right hand *à l'alspenstock*, whilst the left firmly but affectionately held the peaceful calumet which ever and anon emitted nicotian incense that played about the sardonic features of the bold and adventurous wight who, accoutred as per above description, might have been seen one bright morning in early autumn wending his solitary way along a beautiful road that led in the direction of—. But, to descend from Fenimore-Cooperisms, I may premise that having resolved upon a day's photography, I had selected the home district for my peregrinations, persuaded that a contemplation of nature as she might be seen out of the beaten track would prove mentally as interesting and photographically as satisfactory as if I had elected to subject her to the smallest stop of all my three eyes at the seaside, or up the river, or at any one other of the more or less distant places which are overrun by lovers of the picturesque, mainly, I suppose, because they are distant. So I had declared for the metropolitan county.

I have always held that Middlesex, like her eastern neighbour, is a badly maligned shire. In spite of bullet-headed jerry builders and soulless railway contractors, you may, within eight or ten miles of the Landseer lions, encounter Dame Nature under aspects as secluded, as emotional, as absorbing, as she is to be found in any other part of the kingdom. The opinion of Charles Dickens—himself an enthusiastic lover of outdoor beauty—upon the grandeur of the view from the lampstead flagstaff, though often quoted is never gainsaid. This same staff is but three hundred yards or so beyond the limits of a two shilling cab fare, and Palmer's Green Station on the Great Northern Railway is barely six miles from King's Cross, and yet, when I had turned my back upon the unpretentious little edifice and swung round to the left, thus gaining the main Enfield road, I might, if I had not been perfectly well conscious of the contrary, have imagined myself ten times six miles away from "the madding crowd's ignoble strife," so thoroughly peaceful and rustic was the scene. Pondering thus, as the American novelist already named might have phrased it, I was reminded of a picture I had seen in *Tus BRITISH JOURNAL OF PHOTOGRAPHY*, I think, some two or three years ago. It was a process reproduction from a negative by, if I recollect aright, Mr. Dunmore, and represented Ward's Farm, which abuts on Millfield-lane, Highgate—a spot beloved of Coleridge and many of his illustrious contemporaries. I can well imagine that a print from the negative would have been a charming picture; and yet Millfield-lane is actually inside the radius! Londoners are blind to the natural beauties within rifle shot of their front doors. "Absurd!" they say, "who ever heard of a photograph of Millfield-lane? You never see it in the shop windows; nobody buys it." True, with such a name nobody would. Mr. Dunmore made a mistake in nomenclature; he should have called his picture, "Ambleside," or "Rydal Mount," or "Lmwdfon, North Wales," and the result, if less satisfactory to him, would have vastly more impressed the common herd. But I digress.

Resisting at this early stage the temptation to uncup upon a pretty little thatched cottage, which is a familiar landmark at this part of the road, I sped on, and veering to the left at the first finger-post, quitted the charming highway for a lane hardly less sweet. Half a mile's plodding brings one to Winchmore Hill, which, though sadly marred by the bricks and-mortar Vandal, is still in parts amusingly primitive, and boasts its green, and duckpond, and Friends' Meeting House. There is a footpath through Winchmore Hill Wood, which is private property, and liberally planted with awful boards bearing divers legends in small type with the words "Notice" and "Law" of a higher fount. In this vicinity—for obvious reasons I suppress the exact spot—there is a cottage of which I was bent upon securing a negative. Tradition, in the guise of a lore-laden friend, had assured me that this same structure boasted an antiquity measured by centuries, and that in the gruesome days when Dissenters were subject to persecution at the hands of their dear brethren of the Establishment, recourse was had to the seclusion of this cottage for the holding of the forbidden services. If the tale is true, the selection did our Dissenting ancestors great credit, for in those times no better secret

meeting place could have been chosen—hidden away as it was and is from all the great highways in a small forest, intersected by only a footpath.

Arrived at the cottage, I unpacked and proceeded to take aim, when the door opened and the lady of the house appeared. Did she mind me taking her cottage? Oh, no, not at all! But, wondrous to relate, she did not evince the smallest anxiety to be in it. Something unusual, I mused, perhaps she's been in it many times already? I didn't inquire, for she had disappeared; probably, you will say, she was sighting you through the window—more likely she was peeling the potatoes. However, having repacked, I went on my way. The cottage is a one storey erection, with a tinge of the ecclesiastical in its architecture, and pretty to look upon, being almost hidden by ivy and creepers. For this latter reason, I suppose, the negative turned out disappointing—there being no sharp lines save in the diamond-paned windows and chimney-pot. It would have made a better water-colour sketch than a photograph.

Emerging from the wood I turned to the right, along a charming lane called after friend Reynard. A few yards brought me to a cattle pound. A stone's throw farther on, I came to another standstill, and exposed a plate upon a thoroughly pleasing bit, to wit, a row of ancient cottages standing well back from the road, supported on the right by a group of sombre trees and on the left by a Lilliputian alehouse. A butcher boy watched my operations with stolid interest. In order to get him out of the very mouth of my lens, I sweetly asked him if he would like to be in it. "No," quoth the blue-bloused one, "it 'ud cost too much." I vow that I bore no resemblance to the gentleman one occasionally hears of in the police-court, who charges you so much for taking a negative of your house, and unfortunately forgets to send you the prints. The knight of the marrow-bones and cleaver declining to be in it, I not unnaturally suggested he should be out of it, a piece of advice which he took in bad part. However, it served my purpose, for he shuffled away from my camera before a specially selected glance of scorn with which I favoured him, and I made my exposure amid a running fire of uncomplimentary criticisms upon my person and paraphernalia.

Once upon a time I used to believe that the saddle of a bicycle afforded the finest vantage spot one could have wherefrom to appreciate and study scenery. As a photographer, I must qualify that belief now. The cyclist sees and admires only the outlines of a picturesque landscape—it is reserved to the pedestrian to pick out the details, the contrasts, the proportions, and all the varied "filling in" of the picture. If, upon this September morning I had been astride two or three wheels, instead of afoot, it is highly probable that I should have missed the sight of a serenely beautiful bit of still life. Across a low fence I looked upon a smooth expanse of comely park-land well studded with mighty oaks, watered by a miniature lake, and dotted with groups of young deer. Truly a perfect pastoral, and worthy of any of the great grass counties from Nottingham to Surrey. The south-west wind was at my back as I jogged past the park. Was it only fancy—that deep booming sound, or was it the real roar, mellowed down by distance, of Big Ben, seven miles away according to the flight of the crow, that soured up this leafy lane to remind me that the glories upon which I gazed were well within the beat of the Metropolitan police? Verily, I repeat, Middlesex is a maligned shire.

Quitting the precincts of the park, I made a slight detour Londonwards, and ambled through the old-world village of Southgate. There is much that is interesting about this still untouched pre-Victorian spot, untouched, that is, by the hand of the improvement commissioner or smug parochial innovator. Just where the road broadens into the green and is bounded by pretty, old-fashioned, red-roofed houses, a fleeting glimpse of English village life may still be had; stray geese and cattle dot the grass, itinerant hawkers *en route* for Hertfordshire cross the scene. The one or two tradesmen pursue their occupations in the lethargic and leisurely fashion peculiar to the provinces; there is an all-pervading drowsiness in the air; a couple of agricultural looking wayfarers are sitting outside the hostelry, pots in hand; whilst here comes an impossible spectacle in town—a walking funeral—and London is only at the bottom of that hill.

Turning my back upon dear Old Southgate I made for Colney Hatch *via* the lane of that name. The Duke of Buckingham formerly had a house here, and Leigh Hunt used to live on the opposite side of the road. The autumn foliage was a mass of gorgeousness, and a noisy colony of rooks that inhabit a lofty clump of trees hard by were in fine vocal form. The Chapel Cricket Fields here have given many a famous wielder of the willow to the county—notably the Walkers, who practically claim the neighbourhood as their native heath; and the Hearnings to Kent. Half-way down the lane a fine view is obtained, Barnetwards, across a truly typical valley. At the foot of the hill is a mild imitation of a waterfall, whilst in spring the cuckoo haunts the spot—as well he may, for the Walker demesne on the other side of the fence might make a Job envious.

At New Southgate one almost feels as if he had suddenly stepped from the country into town at a stride. I hurried past the asylum with all haste, and after a parting glimpse of the Alexandra Palace was not sorry to turn into Friern Barnet-lane and leave civilisation behind me once more. And here I may remark upon the high favour which this division of the county seems to enjoy amongst some of the great trade houses. At Old Southgate I saw a name not altogether to be disassociated from a western square; at the very entrance gate of New Southgate, looking across a few meadows, I descried on the top of a little hill a pile of buildings obviously dedicated to the worship of the art, and somewhat sug-

gestive of Regent-street and Cheapside. Again, happening to glance towards my left, my eye fell upon the words "Trade Printer," over a doorway; whilst, later in the day, in the town of horse fairs, I happened across the works of another firm whose name recalls Baker-street, together with many other evidences of the fact that the "northern heights" are a desirable location for photographic printing, as well as manufacturing purposes.

Friern Barnet-lane is a delicious survival, recalling in many respects some of those delightful nooks on the Middlesex side of Burnham Beeches. There is a little church here upon which I exposed a plate. Not having a guidebook handy, and being unlearned in architectural styles, I am unable to say to what order the church belongs, but should call it early nineteenth century. The church is surrounded by a belt of trees and a well-kept churchyard. The immortal Stoke Pogean elegy immediately occurred to me, as also the unpleasant piece of prose that the south-wester had not belied its auguries, and that it was raining heavily. It is astonishing how many good negatives are secured under adverse circumstances. I'm sure I have run across "some of the finest in the world," which have been taken "in pouring rain, sir." I confess to entertaining a certain amount of doubt on the point as to how far rain would interfere with a quickly exposed plate, but of its utter powerlessness to interfere with one lengthily exposed I obtained excellent evidence on this occasion, for I gave the church ten seconds with the smallest stop, and secured a perfectly clear, sharp, and brilliant negative, more suggestive of sunbath than showers. After this I resumed my journey, crossed the great North road at Whetstone, turned down a narrow lane, and after a mile or so of uphill and collar work, found myself in the village of Totteridge, which is as rural as Southgate, only more so. It being past midday, and my kit beginning to assert its weight, the "detachment" halted and billeted itself for a couple of hours at—not to put too fine a point upon it—one of those places of public entertainment which Mr. Hardcastle's guests in *She Stoops to Conquer* imagined that worthy old gentleman's house to be.

Totteridge Church has a square wooden tower—rather a curiosity for the district, I should say—and as it is a quaint little edifice, prettily situated and embosomed in a well wooded spot, I uncapped upon it, and after development had no reason to be ashamed of the negative. The next stage of this adventurous tour was Barnet. The fair was on at the time, but things were rather depressed, not to say moist, except in the horse field. Politely but firmly refusing to take any of the swing and shooting gallery sirens, either for better or worse or photographically, I penetrated the howling mob, emerged safely, and strode up the hill to the town. Barnet is—but no, perish the idea! this is not a guidebook. I halted at Hadley Corner, and exposed a plate upon a doubtless very interesting subject, only I didn't exactly know what it was, and there was no one handy to tell me. Here it is: In the background are houses and a turnpike gate; foliage and fences right and left; in the middle of the picture the stump of a tree guarded from injury by iron railings. I had an idea that this was more or less associated with the king-maker, and the obelisk that marks the spot where the great baron fell; but it was only an idea, for nobody seemed to know, and as I have before remarked (or meant to remark) these notes are not based upon guidebook gleanings.

Hadley Woods were but the toes of a pebble away. I spent a delightful two hours in the shadow of their silent glades, and as I had only one plate left much cogitation was necessary before I could prevail upon myself to expose it. When I did at length uncup, it was upon what I conceived to be an idyllic stretch of woodland. Doubtless I was right; it was a delightful picture—if I had secured it. Unfortunately, I subsequently discovered that I had vastly under exposed the plate, and then I remembered it was late in the afternoon when I had taken the cap off, that the sun was low in the heavens, that it had been raining, and that a mist was rising—and, in short, that I had fallen into the old, old error of misjudging and ignoring conditions. Six miles of diversified, sometimes wild, always beautiful, country, brought me to Palmer's Green Station again, just as the stars were glimmering through the sky; tired, of course—as who would not have been?—but delighted with my miniature outing; more than ever in love with the sylvan sweetness and rural repose that still remains in Middlesex, and so full of admiration for the never palling beauties of nature—her perennial charms and undying glories—as to be seriously inclined to drop into poetry in the manner of Silas Wegg—or Mr. Cobb.

MARSTON MOORE.

PHOTOGRAPHERS' APPRENTICES IN SWITZERLAND.

At a recent General Meeting of the Photographic Society of Switzerland, held at Olten, the President delivered the following address:—

"At the first meeting of our Society, held on August 1, 1886, you invited the managers to consider the question of apprenticeship, and to report thereon to the General Assembly in the spring of 1887. The managers have acted upon this invitation, and each of them has collected information as to the conditions of apprenticeship in various establishments. At the meeting of the managers of February 28, 1887, at which M. Pricam and M. Gysi unfortunately had not the power to take part because of ill-health, the information gathered was compared, and it was ascertained that the conditions could not be worse in any profession. In the matter of the duration of the apprenticeships the times fixed are completely arbitrary, so it is evident that good establishments often cannot take on as assist-

ants young men who after their apprenticeship present themselves as accomplished photographers, or at all events they cannot pay them the salary which they ask. We know of one case in which a photographer was created in the short space of two months in consequence of paying a thousand francs as the premium for apprenticeship, and in other cases the time has not been longer than one year or a year and a half; apprenticeships of more than two years' duration are very rare. If we think of the experience necessary to learn the three branches of photography—camera work, printing, and retouching, with all the operations in the dark room—before an apprentice can become accomplished in these different branches, it will readily be seen that the periods mentioned are too short to turn out good photographic workmen. We do not know why photographers should not occupy as much time in learning their business as persons who enter all the other professions. According to statistics collected by the Industrial Society of Switzerland in the year 1886, printers, lithographers, mechanics, goldsmiths, and *bijoutiers*, usually pass through an apprenticeship of three and a half or four years.

"There is another important point to which we wish to draw the attention of our members. In fixing so arbitrarily, as at present, the duration of photographic apprenticeship we are discrediting our own profession, we are degrading it in the eyes of the public, and placing it upon the lowest level.

"The managers have, therefore, to suggest regulations for apprenticeship similar to those which exist already or are on the way to be introduced into other professions, and they think that the adoption of the regulations will be a means of putting an end to the present system, and to raise the level of photographic apprenticeships. The project has been discussed by the managers, and in submitting it to you as the principal subject to be considered at our meeting to-day, we have the honour to recommend you to give it your sanction.

"RULES OF APPRENTICESHIP FOR THE MEMBERS OF THE SWISS SOCIETY OF PHOTOGRAPHERS.

"1. The young man who wishes to be apprenticed shall produce certificates that he has studied at a secondary school, or equivalent place of instruction, or at all events that he has been eight years at school.

"2. As a general rule, no young man shall be accepted as apprentice if he be under fifteen years of age. Exceptions, however, may be made in favour of young men specially gifted, who may then be taken on one year earlier.

"3. Each apprentice must have four weeks' preliminary trial to see whether he is suited for the profession, and whether the profession is suited for him. During this time he may be rejected or may himself renounce the apprenticeship, and in these cases no indemnity can be claimed on either side.

"4. If at the expiration of the time of trial the two parties are satisfied, they shall make a contract of apprenticeship.

"5. The apprenticeship shall not be for less than three years.

"6. The master must initiate his apprentice into all the work carried on in his establishment, and teach him everything fairly, and see that the apprentice changes his branch of work at times appropriate to the circumstances.

"7. The master must also so arrange matters that the apprentice can instruct himself out of working hours, above all in matters of chemistry, physics, drawing, and eventually in that of modelling, at least so far as local circumstances permit.

"8. The master must take care of the health of his apprentice, and not injure his bodily development by working him beyond his strength.

"9. At the end of his apprenticeship the apprentice shall submit to a practical examination by a member of the Society appointed for the purpose. Before being examined he must present a certificate that the time of his apprenticeship has expired.

"10. If the result of the examination is satisfactory, the apprentice shall receive a certificate of efficiency; if unsatisfactory, it shall be refused. (The Society will establish special rules in relation to this examination.)

"11. Members of the Society are forbidden to have more than two apprentices at the same time.

"All the members of the Swiss Society of Photographers shall pledge themselves to observe and apply these rules, after they have been passed by the Society.

"They shall pledge themselves also not to take on any workman who is not in possession of a certificate of efficiency, at least if he cannot justify himself by the fact of having served his apprenticeship before these rules came into force.

"Finally, the members shall engage not to receive any apprentice who shall have been employed by another photographer and left him reprehensibly without serious reason, before the conclusion of his apprenticeship.

"Deliberated and unanimously adopted by the Society, at its second General Assembly, at Olten, April 25, 1887."

SILVER SUBOXIDE.

In the number of the *Berichte* recently issued (May 23) is a communication from Dr. Otto von der Pfordten, in which he considers "that he has proved with certainty the existence of compounds of suboxide of

silver." Having confessed that Wöhler's original method with citric acid is out of the question, he gives two methods of preparation which are in some respects new.

In one of these he adds sodium hydrate solution to neutral tartrate of soda containing some nitrate of silver and obtains a black powder, "which is at all events the suboxide of silver in combination with an organic acid, probably tartaric," and at the same time there is "probably formed a mixture of organic acids." The powder cannot be filtered; it is decomposed by almost every reagent, and it is purified (*sic*) by washing it by decantation with a solution of sodium sulphate! This tartrate, by the action of caustic alkalies, yields the suboxide which is stable in presence of caustic potash, but, singularly enough, is decomposed by pure water.

Notwithstanding the extreme difficulty, indeed the impossibility, of washing such oxides free from alkalies by decantation, and the importance that in this case every trace of organic matter should be removed, no mention is made of any special precautions in this direction.

In spite of the high degree of probability that metallic silver is contained in the product, and that oxygen is mechanically retained, no criterion (beyond assertion) is given of the homogeneous character of the suboxide.

The interest of the paper centres on an accurate analysis, which to be satisfactory must—for manifest reasons—be made on tolerably large quantities of substance; and yet no details whatever are given of such an analysis, except that a certain volume of a very dilute solution of permanganate of potash was used for the titration. And even if these matters were quite satisfactory the problem is a much more complicated one, for we have in the case in question one or all of the following substances:—

- (1) Extremely finely-divided silver;
- (2) Oxide of silver;
- (3) Suboxide of silver.

Each of these retains oxygen, moisture, and alkalies with very great tenacity, and of the behaviour of such physical associations with reagents very little is known. Unless, indeed, it is possible to prepare, as Wöhler attempted to do, a pure salt of the suboxide, of definite composition, the problem is almost incapable of a satisfactory solution. Of course the communication is only given as a preliminary one, but the composition of the suboxide (and any remarks in this note apply equally to the sub-sulphide) is definitely stated, no lack of details of minor importance are given, and the behaviour with various reagents.

My object is not to criticise the paper, which is indeed more open to criticism in parts not touched upon, but only to point out that the conclusions drawn are not warranted by the evidence.

G. H. BAILEY, D.Sc., PH.D., *The Owens College.*

—*Chemical News.*

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 9068.—"Improvements relating to Magic Lanterns." G. CARETTE.—*Dated June 25, 1887.*

No. 9096.—"Improvements in Shutters of Lenses for Taking Instantaneous Photographs." C. KNIGHT.—*Dated June 27, 1887.*

PATENTS COMPLETED.

IMPROVEMENTS IN OR CONNECTED WITH PHOTOGRAPHIC CAMERAS.

No. 9645. THOMAS SAMUELS, Monken Hadley, Middlesex.—*July 26, 1886.*
My invention relates first to improvements in apparatus (such as that for which former Letters Patent were granted to me, dated February 15, 1883, No. 843) for holding a stock of dry plates or films, and exposing them in succession in the photographic camera. This apparatus consists of two boxes or compartments juxtaposed and communicating, and provided with a dark shutter acting also as a means of propelling the plates or films in succession from one box to the other.

My present improvements have for their object, first, to provide a means (in addition to, or in lieu of, that described in the specification of my former Letters Patent) whereby the canting of the sheathed plates or films in the receiving box or compartment may be effected. For this purpose I provide, on the baseboard opposite the receiving box or compartment, a means of forcing backwards or canting the plates or films to make room for the incoming plate or film. Such means may consist of springs, or of lever arms on a rock shaft, or of a combination of the two, the same being so situated as to act on the sheath or holder, and not upon the plate or film, for the purpose of canting it, and so as not to obstruct the passage from one box or compartment to the other.

My improvements have, secondly, for their object, to adapt the apparatus to be applied to cameras to which the apparatus described in my aforesaid specification could not be conveniently adapted; also to avoid any projection of the dark shutter beyond the end of the apparatus when drawn back for exposure of a plate, and to avoid the necessity for providing against the leakage of light into the apparatus on drawing out the said shutter; also to enable the capacity of that form of the apparatus which consists of a single box divided into two compartments to be doubled without increasing its dimensions, whereby it is adapted for tourist as well as for studio use.

The improvements consist in placing the exposing aperture opposite the receiving compartment, so that the plates or films will be brought by the shutter to the exposing position instead of being moved thereby out of exposing position, as in the former case. To enable this to be done, and to

make the shutter wholly contained within the apparatus, I use a shutter of thin sheet metal, which is actuated by a sliding rod connected to its front or outer face at a point near its leading edge, the rod passing through the exposing aperture, and through a suitable guide outside or along the front face of the apparatus without projecting beyond the end thereof.

The propelling part of this shutter is situated at the rear edge of its inner face, the sheathed plate or film resting, whilst being propelled, against the shutter, and being left by it opposite the exposing aperture on the withdrawal of the shutter, spring detents being provided, if necessary, to prevent the plate being carried back with the shutter. To permit this shutter to work easily, springs are provided, against which the plates, pushed forwards towards the shutter, rest, so as to relieve the shutter of part of the pressure during its motion. On the shutter reaching the end of its motion, these springs are pushed aside, and the front plate allowed to come forward into position against the shutter to be propelled thereby. The old form of shutter may, however, be adopted, with the addition of the sheet metal portion herein described.

The canting of the plates in the receiving compartment, in order to allow another plate to come in front of them, is effected either by the levers and rock shaft above referred to, operated by hand, or by similar levers actuated automatically by the shutter itself, the actuating parts of the shutter and the levers being so formed and arranged as to be inoperative during the motion of the shutter in one direction.

In order to enable both compartments to be filled with plates or films, and so double the capacity of the apparatus, I provide a second passage between the compartments at the back, and also a means of propelling the plates from one compartment to the other in the opposite direction to that in which they are moved at the front, so that the plates will be caused to perform a complete cycle of motion.

Such means may consist of a sliding catch actuated from the outside of the back cover of the apparatus, and engaging at the inside with the sheath of the rearmost plate or film for the purpose of moving it from one compartment to the rear of the plates in the other compartment. This sliding catch may be worked alternately with the shutter, or it may be connected therewith, so that the two will work together. The combined working may be effected either directly by hand or through a mechanical movement, such as a transverse shaft gearing at front and back by rack, slotted cams, levers, or other motion with the two parts to be operated.

The springs by which the plates are pressed forwards in both compartments are necessarily modified to adapt them to the altered circumstances, and they are so placed, and act on the plates in such manner, as to produce the least pressure against the sliding shutter compatible with holding the plates in their proper position.

My invention has, thirdly, for its object to dispense with the division of the apparatus into two compartments, the whole of the plates being placed in a trough-like compartment in front of one another and transferred successively from one end of the series to the other as they are exposed. This is effected by the use, in combination with a shutter constructed and operated as above described, of a flexible bag-like chamber enclosing the top of the trough-like compartment above referred to, through which flexible chamber the plates are transferred from one end of the series to the other.

The invention has further for its object to dispense with the usual rack and pinion or screw motion used for focussing, and consists in a lever adapted to engage with the focussing slide (which carries the movable part of the camera) at different points thereof, the angular motion of said lever producing a rectilinear motion of the slide, the lever working on a movable centre, or other means being provided of allowing for the difference between the two motions.

The claims are as follows:—1. The employment in a photographic changing back of the kind described in the specification of my former patent or of the kind herein described, of a rock shaft and levers (either with or without springs) arranged and operated as described, for the purpose of canting the plates, as specified. 2. The employment in a photographic changing back of the kind described in my former patent of springs applied as described for the purpose of canting the plates automatically, as described. 3. The employment in a photographic changing back of the kind herein described of levers actuated by projections on the shutter, and applied so as to act on and cant the plates, the action of the levers being dependent on the motion of the shutter, as specified. 4. In a photographic changing back, consisting of two juxtaposed compartments as herein described, a shutter working wholly within the apparatus, and actuated by a handle or bar connected to the front of the shutter, and passing through the exposure aperture, and sliding along the front of the changing back, substantially as specified. 5. A sliding shutter for a photographic changing back of the kind described, working wholly within the two compartments of the back, and consisting of a thin metal plate provided with a projection on the rear face in such position as to carry the sheathed plate or film from one compartment to the other, whilst the same is resting against the shutter in the manner described. 6. In a photographic changing back of the kind described, the combination with a shutter provided with a projection on its rear face for propelling the sheathed plate or film whilst the same is resting against the shutter, as described; of springs acting in conjunction with the said projection for preventing the next succeeding plate or film advancing until the shutter has been moved back into position to receive it, the springs being moved back out of the way by the shutter, substantially as described. 7. In a photographic changing back of the kind described, the combination with a shutter, acting also as a carrier, for propelling the sheathed plate or film whilst the same is resting against it, as described; of spring detents, applied as shown and described, to prevent the shutter, on its withdrawal, drawing back with it the plate or film which it has just propelled. 8. A photographic changing back constructed and operating as herein specified, and comprising a box divided into two compartments communicating at back and front as described, and both filled with sheathed plates or films, a shutter acting also as a carrier for propelling the sheathed plates or films successively from the front of the one compartment to the front of the other as described; plate-canting levers arranged and operating as described; a drag hook or catch carried by a slide working in the back cover as described, for moving the rearmost plate or film from the one compartment to the other in the opposite

direction to that in which the foremost one is moved by the shutter, and springs attached to the back cover, and pressing the plates or films forwards in both compartments, all combined for operation substantially as shown in the drawings. 9. The combination with a changing back, consisting of a box divided into two juxtaposed compartments communicating at front and back, as described; of a drag hook or catch projecting into the one compartment, and attached to a sliding bar fitted to work in a groove in the interior of the part of the back cover opposite the one compartment, and in the exterior of the part opposite to the other compartment, so that the catch and the means of operating it are not opposite the same compartment, and there is no slot directly through the cover, as described. 10. A photographic changing back, consisting in the combination with a trough-like compartment containing a series of plates placed in front of one another of a flexible or bag-like chamber communicating with the said compartment, and of a means of lifting the foremost plate partly or wholly out of the compartment into the bag, so as to enable it to be seized from outside the bag and transferred from the one end of the series in the compartment to the other, as described, whether such means be a shutter acting also as a lifter, as described, or a simple lifter only, substantially as specified. 11. The improved motion for operating the focussing slide, consisting of a lever pivoted to the baseboard and engaging with the said slide as described or *vice versa*, the varying angle of the lever relatively to the slide being allowed for in one of the ways specified.

IMPROVED ARRANGEMENTS FOR COATING GLASS OR OTHER SURFACES USED AS A SUPPORT FOR PHOTOGRAPHIC EMULSIONS.

No. 9886. JAMES WILLIAM THOMAS CADETT, 84, Grove-Jane, Camberwell, London.—July 31, 1886.

My invention is intended for coating glass or other surfaces, used as a support for photographic emulsions, with such photographic emulsions, where such coating is done on travelling or moving surfaces in one direction. My invention is particularly applicable to the tables or setting surfaces now in use where a cord or cords, or chain or chains, or band or bands, or other moving surfaces or arrangements, carry the glass or other surfaces to be coated in one direction while being coated.

My invention has for its principal objects: Firstly, the even spreading of the photographic emulsions on the surfaces to be coated, after the photographic emulsion is laid down, not necessarily evenly to begin with, on the surfaces to be coated; and, secondly, means for ensuring a proper and unfailling delivery of photographic emulsions to the surfaces to be coated.

In combination with the above-mentioned tables or carrying arrangements for the surfaces to be coated, I use a rod or rods, or surface or surfaces, or tube or tubes, arranged so as to rest across the surfaces to be coated without touching such surfaces to be coated, excepting at such points or places as may be necessary to support such rod or rods, or surface or surfaces, or tube or tubes.

The rod or rods, or surface or surfaces, or tube or tubes, is or are arranged at such a suitable distance from the surfaces to be coated, that when photographic emulsions are put on the surfaces to be coated, and are carried by the above-mentioned tables or carrying arrangements under the rod or rods, or surface or surfaces, or tube or tubes, the photographic emulsion is spread by capillary attraction across the surfaces to be coated, and thus a practically even film obtained.

For putting down a suitable and proper amount of photographic emulsion on the surfaces to be coated I prefer to use an open chamber with a series of plugs or valves, such plugs or valves when in use being kept in action by suitable power so as to intermittently and continually open and close, and thus lay down a suitable quantity of photographic emulsion, such above-mentioned chamber with plugs or valves being filled to a suitable extent with photographic emulsion, and such chamber being placed in suitable position over the surfaces to be coated. Arrangements can be made to keep such chamber warm by fire, hot water, or hot air or gases, and the above-mentioned rod or rods, or surface or surfaces, or tube or tubes can also be kept warm by hot water, or hot air, or gases passing preferably through it or them.

The claims are:—1. The use of a rod or rods, surface or surfaces, or tube or tubes, substantially as described, arranged so as to rest across the surfaces to be coated as described, in conjunction with arrangements for moving or carrying the surfaces to be coated. 2. The use of plugs or valves for intermittently opening and closing, substantially as described. 3. The use of the said rod or rods, surface or surfaces, or tube or tubes, as mentioned in claim 1, in conjunction with the plugs or valves for intermittently opening and closing, substantially as described.

IMPROVED PHOTOGRAPHIC CAMERA.

No. 4718. CHARLES CUSWORTH, 16, Ellington-street, Islington.—March 30, 1887.

THE objects of my invention are:—

- 1st. To facilitate the erection and closing down of that part of a photographic camera known as the Front.
- 2nd. To expedite focussing.
- 3rd. To enable the front to be fixed at any angle to the baseboard; and
- 4th. To facilitate the fixing of the rising front at any required distance from the focussing screen.

I carry out the first of the said objects by attaching the bellows of the camera to the front, and allowing the front to slide up and down a slotted frame provided for its support.

The second of my objects is carried out by attaching the front to its supporting frame, which in its turn is attached to sliding pieces, and allowing the supporting frame to slide backwards and forwards in a carrying frame, which has a rack and pinion movement attached to its underside, thus giving, by means of the rack and pinion action, a to-and-fro movement to the front.

The third object is of a twofold nature, and is carried out by (a), centering the supporting frame into the sliding pieces, thus allowing the supporting frame to rotate; (b), attaching to the sliding pieces, and at a distance from the centre, a slotted strip by means of a pin; the said slotted strip extending up-

wards past the side of the supporting frame. A milled headed screw is attached to the side of the supporting frame and slides in the allotted strip. By means of this milled headed screw and slotted strip the front may be held firmly in any desired position.

The fourth of my objects is carried out by attaching to the side of the sliding piece a block on the underside of which is an inclined plane. The fulcrum of a lever is also attached to the side of the sliding piece, and on the side of this lever is another inclined plane.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS.

No. 6076. WALTER CLARK, New York, United States.—April 26, 1887.

The object of my invention is to improve and render more certain the action of the devices which produce the instantaneous effect in photographic cameras, and also to improve the devices for focussing.

My invention consists of a camera box, preferably of the kind having the lens and its tubes within the box, provided with a hinged lid, which, when lifted, carries with it a ground-glass focussing plate which is maintained in a horizontal position by a certain arrangement of links, and is always at the same distance from the mirror upon which the incident rays are received that the said mirror is from the surface of the sensitive plate. The ground-glass plate is also provided with a hood so arranged as to fold within the box when the lid is lowered.

My invention further consists in placing within the camera box, a drum revolving upon a vertical axis under the action of an adjustable coiled spring, controlled by a friction wheel, open for a portion of its cylindrical surface, and provided in the closed portion with a window for the admission of the light rays when the window passes the aperture of the lens.

My invention further consists of certain details of construction of the various parts to render their action more certain and efficient, and to ensure the entire exclusion of light from the dark chamber. These minor features will be more fully hereinafter set forth.

[The remainder of the specification could not be understood without reproducing the engravings.]

The claims are:—1. A photographic camera provided with an inner lid, to which is pivoted a revolving drum containing the focussing mirror; said inner lid being retained in place by a projection on the plate holder, substantially as described and for the purposes specified. 2. A photographic camera provided with a revolving drum mounted on a vertical axis and placed immediately behind the lens; said drum carrying the focussing mirror and provided with a window to admit the passage of light at the proper time through the lens to the sensitive plate, as herein described and shown. 3. In a photographic camera the hinged lid and ground-glass plate pivoted thereto and raised and supported by links; the parts being so arranged and adjusted that when raised the plate is always the same distance from the focussing mirror, as herein described and shown.

AN IMPROVED APPLIANCE FOR USE IN TREATING AND WASHING PHOTOGRAPHIC PRINTS AND PLATES.

No. 6353. The Hon. WILLIAM GRIMSTON, Gorhambury, St. Albans, Herts.—April 30, 1887.

My invention has for its object to provide a simple appliance, by which the treating and washing of photographic prints and plates may be effected very efficiently and rapidly.

According to my invention, I provide a tray or receptacle, of any suitable shape, but made of perforated or reticulated material, such, for example, as perforated sheets of galvanized iron, or woven wirework, or papier maché, or earthenware with a number of perforations therethrough.

Into this receptacle the prints or plates to be treated or washed are placed, and in such treatment or washing the water or liquid is caused to pass through amongst the prints and out from the receptacle; for example, the receptacle may be placed in any common bath, and be withdrawn at intervals, so as to cause the water or liquid to run out from the receptacle, and carry with it the matter which has been removed from the prints or plates, or by which the prints or plates have been treated, or the receptacle may, for washing purposes, be placed in a stream of water. My invention is especially adapted for large photographic prints on paper, as the receptacle can be taken with the prints in it from bath to bath from beginning to end without handling, thus obviating the chance of tearing the paper.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—For and in treating or washing photographic prints and plates, a perforated or reticulated receptacle, through which water or liquids can be caused to pass without the necessity for handling the prints or plates, substantially as hereinbefore described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
July 4	Notts	Institute, Shakespeare-street.
" 5	Coventry and Midland	Coventry Dispensary.
" 5	North London	Myddelton Hall, Upper-st., Islington
" 5	Glossop Dale	Society's Rms., Norfolk-sq., Glossop
" 5	Holmfirth	
" 5	Sutton	Society's Rooms, 18, High-street.
" 5	Sheffield	Masonic Hall, Surrey-street.
" 5	Bolton Club	The Studio, Chancery-lane, Bolton.
" 6	North Staffordshire	Mechanics' Institute, Hanley.
" 6	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 7	London and Provincial	Mason's Hall, Basinghall-street.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Last Tuesday night, at a meeting of the above Society, held at 5a, Pall Mall East, London, Mr. William England, Vice-President, occupied the chair.

The CHAIRMAN introduced to the meeting Mr. Winslow Upton, Professor of Astronomy, Brown University, Providence, U.S.A.

Mr. G. L. ADDENBROOKE exhibited a camera stand made by Messrs. Sands & Hunter, which he said was the best he had ever seen; he then explained its principles of construction. He also exhibited a tourist's camera by the same makers, likewise a bamboo stand devised by himself.

Mr. SCAMMELL asked if he knew the time required to unpack the stand and get it into use.

Mr. ADDENBROOKE replied that he did not.

Dr. JOHNSON exhibited a twill bag lined with indiarubber, to keep dust, damp, and light from slides. He had been trying in Holland a dark slide devised by Mr. Brown, of Clerkenwell, and had found it to be without fault, and that he could change the plates more rapidly than with an ordinary slide; it had also improvements in its springs, bringing the plates to absolutely perfect register.

Mr. W. F. DONKIN exhibited the camera with which of late years he had taken his Alpine views. In taking panoramic views, a class of pictures for which he cared little, he saw no use in a plumb line under the optical centre of the lens unless for objects abnormally close to the camera; with ordinary landscapes one view might be taken a few yards from its neighbour; he had done it often. The apparatus should always be carried knapsack fashion on the back, weight then being much less felt, but straps across the breast should be avoided; the straps over the shoulders should be broad. It was quicker to have a case for the stand, because then the legs could be pushed in anyhow, and there were no straps to buckle. His whole arrangement, with an Eastman's slide and the legs included, weighed fifteen pounds, for $7\frac{1}{2} \times 5$ negatives. A level was very necessary in mountainous countries, especially when setting up the camera on uneven ground, where the eye is often grievously deceived; his level consisted of a plumb line in shape of a piece of wire three or four inches long suspended alongside part of the woodwork of the camera. He thought Dr. Johnson's indiarubber cases to be good. Abney's plan of painting interior edges of the slide with glycerine to keep out dust was excellent.

Mr. T. SEBASTIAN DAVIS demonstrated his method of wrapping an indiarubber cloth round each of his camera slides, and so using it as to, all through the exposures and operations, keeping it from the direct light from the sky.

The CHAIRMAN kept each of his slides in a cardboard case.

Mr. W. E. DEBENHAM asked whether Mr. Donkin's plumb wire did not swing in the wind.

Mr. DONKIN replied that it did so sometimes, but the wind was then easily kept off sufficiently by the hand.

Mr. T. BOLAS put a question in reply to which all but one speaker said that circular spirit levels were very liable to get out of order quickly when in daily use.

Mr. DAVIS exhibited his camera made of blackened deal, which was also its own packing case. It was, he said, simple and efficient, and necessarily perfectly rigid.

The Chairman exhibited his travelling tent, in which he could develop 12×10 negatives, and which weighed five pounds.

Mr. SAMUELS said that a tent was handy to use as a packing covering for apparatus.

Mr. FOX SHEW exhibited some of the Balagny films, which, he said, had been popular now for two years in Paris, but did not seem to be much known in this country. They exhibited no structure at all, did not expand or curl up in the developing solutions, required no greasy or other after-treatment, and were treated just like glass plates, except that they must be alumed after developing, and must be quickly dried by means of methylated spirit with a little glycerine added.

Mr. E. COCKING announced that the meeting to consider the proposed new rules of the Society would be held on the third Tuesday in July.

The proceedings then closed.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

At a meeting of the above Association, held at the Masons Hall Tavern, City, London, on Thursday, June 23, Mr. W. E. Debenham presided.

Mr. J. TRAILL TAYLOR said that he had received from Mr. Mayall his long-promised photograph in natural colours; he would exhibit it and let it speak for itself.

Mr. Taylor's likeness was then handed round, and it evoked some expressions not complimentary to the artist or the process.

The CHAIRMAN thought that something should be done by the photographic societies to make a stand against pretensions to take photographs in natural colours, because photographers as a body suffered by such public pretensions.

Mr. J. J. BRIGINSIAW said that the ignorance of daily newspapers about scientific subjects had much influence over the public in the matter.

Mr. TAYLOR had been looking at the Jubilee illuminations, and thought that lantern slides might be made to represent them by printing a dark positive on glass and afterwards pricking holes in the film where the lamps were, to represent the lights.

Mr. Atkinson exhibited a group of some members of the amalgamated photographic organizations, taken on the occasion of their visit to Watford on Jubilee Day. The meeting then broke up.

CAMERA CLUB.

On Thursday, June 23, a varied exhibition of lantern slides was given. Several visitors very kindly accepted invitations to favour members with a view of their work, amongst these being Messrs. J. B. B. Wellington, R. J. Wilkinson, W. England, and Major Nott.

The members exhibiting were Messrs. Gale, C. B. Wright, Brownrigg, Lyonel Clark, Ferrero, Dresser, Howlett, and Davison.

Two series were shown by Mr. Wright, one including some very fine views in Norway, and the other representing work in North Devon.

Mr. Gale and Mr. Wellington both exhibited some very fine slides, chiefly landscape and country scenes with figures.

Mr. Wilkinson sent by request half a dozen slides which were bracketed with a similar number by Mr. Burton Barber to receive the highest award at the last annual competition of the Amateur Photographic Field Club.

Mr. W. England exhibited slides from negatives taken in Shew's fixed focus sharp camera. The transparencies were full of detail and marvellously sharp throughout.

Slides made from some of Major Nott's fine negatives of animals taken in the Zoological Gardens were shown, as also some similar work by Mr. Dresser.

During the evening some very handsomely got-up lenses called "Star" lenses, just introduced here under the agency of Messrs. Hinton & Co., were handed round and critically examined. Attention was also drawn to photographs of the Jubilee procession, taken by Messrs. D. P. Rodgers and Lyonel Clark.

Club excursions for members and friends have been arranged for Saturday, July 9, to Eynsford and Lullington; Wednesday, July 13, to Rochester; and Saturday, July 23, to Pangbourne for Streatley and Goring.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting of this Society was held at the Greyhound Hotel, Dulwich, on Wednesday evening, June 22,—Mr. Eskell in the chair.

Mr. James was elected a member.

According to arrangement, members brought with them their complete outfits for work in the field.

The more important features of the different kits were explained, which led to an interesting discussion.

The next meeting will be held on July 6.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

AT the meeting held at Myddelton Hall, Islington, N., on Friday, June 17, Mr. J. Traill Taylor, President, in the chair, Messrs. G. McCourt and F. T. Parsons were elected members of the Society.

Mr. A. PRINGLE gave an account of the preparations that the Local Committee in Glasgow of the Photographic Convention of the United Kingdom had made for the reception and entertainment of the members attending the meeting in July.

Mr. E. DUNMORE then delivered a lecture on *Photography Past and Present* [see page 390].

Mr. A. PRINGLE said that Mr. Dunmore had referred to a class of photographers who cared little for the artistic qualities of the pictures they produced so long as they were technically good as photographs. There was, however, a class among amateurs who studied the artistic side and neglected the technical, and seemed to think if the composition of a picture was good that the quality of the negative was of little importance. He agreed with Mr. Dunmore on the importance of art in connection with their work, but at the same time thought too much stress could not be laid on the importance of thoroughly mastering the difficulties of development. No picture was ever the worse for the negative being technically perfect, and he thought that it should be the aim of every photographer to produce work perfect technically as well as artistically. He had recently been devoting much time to photo-micrography, in which work the technical branches of photography were all important.

Mr. J. NESBIT thoroughly appreciated the remarks Mr. Dunmore had made with reference to the difficulties that photographers had had to contend against in the wet process days. He commenced photography in 1853, and had not only practised the wet process but several of the dry processes. He did not feel so satisfied with the work he had recently produced as with that of times gone by, as he felt that he had not kept pace with the opportunities now afforded for attaining perfection.

Mr. A. MACKIE said that, while he quite agreed with Mr. Dunmore on the importance of the art side of photography, he also agreed with Mr. Pringle's views as to the importance of a thorough grasp of the technics. He thought that amateurs often failed, especially in their attempts at portraiture, from their inability to keep their minds free from matters appertaining to the dark room at times when the whole attention should be given to the subject of the picture and its lighting and composition. Amateurs, too, were too often slaves to some particular form of developer, and made their exposures to suit that developer. This he thought a wrong method of proceeding, as there was no developer that would equally suit every plate or every subject. The developer should be modified according to circumstances. He could not impress too strongly the importance of remembering that the lens only produced the picture as it appeared, and that therefore, until the plate was exposed, the undivided attention should be given to matters pertaining to the picture as a picture, leaving development for after consideration.

Mr. E. CLIFTON thought that we were too fond of trimming our prints to regulation shapes and sizes without reference to their suitability to the subject. Frequently a charming picture might be produced by taking a small portion from a plate which was unsatisfactory as a whole.

Mr. J. JACKSON spoke of his experiences with wet plates and also with dry plates made by himself by the earlier bath methods, using tea, coffee, beer, &c., as preservatives. He fully appreciated all that Mr. Dunmore had said as to the difficulties and inconveniences of wet plates.

Mr. W. F. COX said that the technical part of photography could be mastered by a little serious study. He thought that the art difficulty could only be met by a course of study in an art school.

Mr. PURTON said that, in the Colonies, the silver bath was still used in many studios for portraiture, and in all for copying. Very excellent dry plates were now being made in Australia, but they seemed especially suitable for portraits and did not give the vigorous image wanted for landscapes. He considered that the Colonists held their own in portraiture but not in landscape work, but this was probably because the scenery was comparatively uninteresting.

Mr. HEALEY said he was probably the oldest photographer present. He commenced in 1847, and had first worked Daguerreotypes. He had also used the wet process, and had taken instantaneous portraits by it. Hill Norris's were the first dry plates he used, but later on he had made collodion emulsion.

For some years he ceased to practise photography, but the conveniences of gelatine had induced him to take up again his old hobby.

Mr. J. OAKLEY spoke of the improvement in the picture to be obtained in some cases by taking a low point of view. He thought that many amateurs failed to do their best by attempting too many plates. He thought they should do less work, but it should be more carefully considered.

The proceedings terminated with a vote of thanks to Mr. Dunmore.

Next meeting, on Tuesday, July 5, a technical meeting.

DERBY PHOTOGRAPHIC SOCIETY.

THE members of this Society held an excursion to Cromford and Matlock on Saturday afternoon last, when some excellent negatives were obtained, the weather being favourable and the attendance a good one.

The excursion next Saturday will be to Miller's Dale for Cressbrook Dale.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE monthly meeting of the above Society was held in the Technical Schools, Bridge-street, on the 23rd instant,—Mr. W. J. Harrison, F.G.S., in the chair. There was a good attendance.

The minutes of the last meeting were read and confirmed, and Messrs. A. A. Atkins, S. Baxter, C. J. Jarvis, and R. L. Wareham, were elected members.

The following gentlemen were nominated for election:—Messrs. F. Barnett, H. R. Wakefield, G. Wiseman, E. Shilton, and C. W. Tiern.

A communication was handed in from the Meteorological Society, asking for photographs of lightning from members who had taken or would take some when opportunity occurred.

Mr. J. H. PICKARD read record of excursion to Miller's Dale:—

With a contingent of twelve members and ladies, we started on Whit Monday morning by Midland Railway at nine a.m. After a quick run, we arrived at Miller's Dale Station. The first thing to do was to make tracks for the "Anglers' Rest" Hotel to arrange for our evening repast. Commencing with taking views of the picturesque village and winding river, we then proceeded along the road, above which runs the lofty railway viaduct, finding many points of interest, especially at the mill and bridge, and came to the pass through the Miller's Dale, a short distance bringing us quickly into its beauties. It opens somewhat similar to Dovedale, a sort of torrent walk giving capital studies for the camera of trees and stream effects. The Dale at the distance of about a mile widens out, with high hills on the one side, the stream or River Wye winding in and out, giving many tempting bits of scenery. We then proceeded to some natural steps in the rocks leading to a fine rocky dell or gorge, which presented a beautiful effect when viewed through the ground-glass, rather difficult to take, owing to the diversity of light and depth of shadow. Turning to the left, and climbing up and down the rocks, slippery with moss, &c., making our way slightly perilous, many of us having awkward slips, we came suddenly upon a grand scene, without doubt the finest of its kind our cameras have been pointed at. "The celebrated Chee Tor," the numberless cascades on the winding river running through the chasm between the gigantic rocks, covered in many places with climbing verdure almost to the top. These rocks are of a horsehoe shape, the deep chasm no doubt having been formed by volcanic action or a mighty rush of water in remote ages ago; in some parts the grandeur is almost appalling. It was in this gorge that our facetious Mr. Cox was infatuated enough to take up his dwelling in a small, narrow cave to have his physiognomy photographed; when it was done he coolly said, "Give the picture a name." Echo answered, "The Cheetah of Chee Tor." The pathway along this gorge is rather dangerous, and in wet weather is impassable owing to the water rising above the narrow pathway under the cavern-like openings under the side of the rocks, in many cases only stepping-stones under dropping wells, the surface-water percolating through the rocks. One might stay here and take pictures by the score, each turn giving you fresh beauties. Crossing the stream by a trellis bridge, and under a wonderful railway bridge thrown across the chasm from the mouth of one tunnel to another. (The chasm and bridges reminded one of the "Devil's Bridge," at Aberystwith.) We could not get a picture of these bridges owing to the foliage being blown about so by wind, which rushes through the opening, and the light preventing us using the shutter. With regret, we followed in single file (the ladies preferring to stay where they were till our return) along the pathway, and, descending by a long length of steps, crossed the stream again, reaching the valley along which the path runs towards Buxton. Some good views were obtained here, but time not allowing us to go farther, we rejoined our companions and retraced our way, photographing whatever points we had missed in the morning. On reaching the railway bridge at the village, passing shots were had at the express train, also a fine flock of geese. The concluding picture was taken by our rear guard, Mr. Iliff, namely, a group, to help to swell our book of excursionists; and, after a capital tea, &c., we reached the station in good time, and arrived in New-street Station about forty minutes past ten p.m., all well pleased and with great intentions to go over the same ground some other time again. The number of pictures taken was one hundred and seven.

The CHAIRMAN gave notice of the Glasgow Convention on July 4 next.

A number of exhibits of photographs taken at the last excursion by Messrs. Birkett, J. H. Pickard, and Humphries, and some very fine instantaneous ones of the new steamers plying to the Isle of Man by Mr. E. H. Jaques, which were much admired.

Mr. F. BIRKETT then gave his paper on *Printing by Artificial Light*. He mainly drew the members' attention to Alpha paper printing, and, in the course of his remarks, said:—

It is an advantage to amateurs on some occasions to be enabled to print from their negatives at night or during the winter months. There are two kinds of papers one can use—the bromide and the chloride. The bromide is pretty well known in the shape of Eastman's, Morgan & Kidd's, Fry's, Marion's, and others; but with all these the black and white tones only can be obtained. Many people say this looks cold; they like something warmer, or more like the tone of the silver prints on albumenized paper. By using the chloride you can get almost any tone you wish. Still, preferring myself the ordinary silver print, I use as a substitute the Alpha paper. I used Morgan & Kidd's contact paper till they discontinued making it. The negative should be a good one, not too thin. On bromide paper a thin negative will give a good print, but with the chloride a plucky negative, as with silver prints, gives the best results. The light through one thickness of golden fabric is quite subdued enough to work by; in fact, I have used the gaslight, turning down just enough to see what I was doing, of course keeping my dishes well covered up as much as possible. Exposure comes next. It is here you must decide what tone you want the resulting prints to be. For a warm tone give a long exposure and short development; for a black tone a short exposure and long development. A long exposure means two minutes, twelve inches from an ordinary gaslight, a dense negative requiring much more. The developer is the one given by the makers of the paper, namely, a weak iron one. Wet the prints in clean water, and place in developer (not too many at once). The picture comes out quickly; you will see how far to go. They will alter but little in tone in the subsequent solutions, &c. Wash at once in a

solution of citric acid made very weak, or it will fetch the picture off; well wash. Tone in acetate toning bath with chloride of lime. You cannot see much change in the colour; for myself I leave them four or five minutes. Fix in the ordinary way; but here they must be carefully watched as they turn a nasty yellow, then brown. The moment they reach the colour you require well wash in several waters. All the waters and solutions must be cold. The face of the print can be glossed or polished by drying on ebonite or glass, cleaned with French chalk.

The paper was accompanied with practical illustrations, and proved very interesting.

The CHAIRMAN asked members to come forward with papers for the remaining half session, some few being required to fill up the programme, and the meeting concluded.

PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A STATED meeting of the Society was held Wednesday evening, June 1, with the President, Mr. Frederick Graff, in the chair.

The Committee on Presentation Pictures for 1887 reported that they had selected *On a Virginia Turnpike*, by Mr. John G. Bullock, and *The Elephant's Caves, India*, by Mr. Charles R. Pancoast.

The paper for the evening was read by Mr. CHARLES TRUSCOTT, the subject being *Some Photographic Heresies* [this will appear in a future number]. The reading of the paper was followed by an interesting discussion of various points touched on by the writer.

Mr. COATES preferred to use plates slow enough to give several seconds' exposure, as with extremely rapid plates cap exposures could not well be given for such times as one, one and a half, or one and three-quarter seconds.

Mr. ZECKWER suggested the plan of counting as rapidly as the numbers could be pronounced from one to five, which would be found to take about one second. If, then, one and three-fifths of a second are required for the exposure, by counting thus rapidly one to five and then one to three the fraction of the second would be determined with sufficient accuracy for practical purposes.

It being suggested that the time could be prolonged by use of a small stop, Mr. TRUSCOTT made the objection that this was likely to cause diffraction of the rays of light, and consequent fogging of the plate. He stated that the shutter he used was accurately graded for short time work from one-two-hundred-and-fiftieth to two-thirds of a second.

In reply to a question by Dr. Wallace, Mr. TRUSCOTT stated that in wet plate photography with short time exposures, such as portraits of babies, &c., he had frequently heated the developer to about 100° Fahr. before applying to the plate. For developing short exposures on gelatine plates, he used carbonate of soda, one part to four of water, varying the solution from one-fourth to full strength. He found different brands of plates to vary greatly in the time necessary for development. As to the most desirable position for a shutter, he considered back of the lens the best for avoiding fog, and in the middle of the lens the best for economising space.

Mr. FASSITT called attention to an article on page 144 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1887, on *A Cheap, Simple, and Effective Reducer for Gelatine Negatives*. The directions called for diluting "ordinary chloride of lime with half its bulk of water," and then immersing the negative in the mixture about twenty seconds. Mr. Fassitt found on trying the plan that the quantities specified produced merely a thick paste, and not a solution in which the plate could be well "immersed." Its action was to quickly and entirely remove every vestige of the film from the plate. As to its effectiveness there could be no doubt, but its use for any other purpose than cleaning glass could hardly be advised. The publication of such impracticable recipes was calculated to do much harm, as they are frequently copied into one journal after another without trial or investigation by the publishers, continuing their misleading career indefinitely.

Adjourned.

Correspondence.

Correspondents should never write on both sides of the paper.

JUBILEE.

To the Editors.

GENTLEMEN,—Jubilee Day, the 21st of June, 1887, was twin sister to the first day of Her Most Gracious Majesty's reign in 1837, both unexceptional model days in unclouded sunshine, and the first in the world's history of a Queen's Jubilee. The newspapers have been full of the episodes of the Victorian age, but none has realised it more beautifully than Liverpool, in grouping together life-size marble busts of Her Majesty and her family amidst floral decoration in one of the large halls of the Walker Art Gallery. It is the arrangement of Mr. Charles Dyall, the Curator, whose talents in this peculiar display of art is well known. It has been photographed by Messrs. Brown, Barnes, & Bell, of this city, and makes a very fine *souvenir* of this most interesting event.

It was not until 1839 that the art-science of Photography was discovered; the pencil of light was led captive to delineate everything that is lovely in nature, and has become the handmaid of Art, Science, Commerce, and Manufacture. In its short life it has given lustre and happiness to every cottage, as well as every palace, throughout the world. It has even startled us by its boundless revelations of star worlds, that even the telescope has failed to discover. It has given employment to millions all over the world, and opened the floodgates of art treasures hoarded for centuries to the great masses of all peoples in every land. Thus the seed has been sown that will fructify in ages to come.

I feel compelled to drop the metaphor to return to a record of photography on the Jubilee Day. Alderman Samuelson, who now resides at Trefriw, North Wales, invited the photographic societies of this city and Birkenhead. Twenty in number accepted, and a more enjoyable day was

never spent among the beautiful scenery of that charming neighbourhood; 165 plates were exposed, a selection of which are to be presented to Mr. Samuelson as a *souvenir* of the happy Jubilee, which ended in a most hearty singing of the National Anthem.

JAMES ALEX. FORRENT,

President of Birkenhead Photographic Society.

Liverpool, June 29, 1887.

HER MAJESTY'S JUBILEE—PHOTOGRAPHERS' OFFERING.

To the Editors.

GENTLEMEN,—May I offer the following suggestion? In every town in the kingdom, and almost every village, some loyal demonstration has been made in honour of our Queen. It has also happened that in nearly every instance the local photographer has secured views of the decorations, processions, triumphal arches, dinner tables, &c. Now these photographs, if collected, would convey more real information than twenty newspaper reports. If you were to solicit from every photographer one or two of his views taken on Jubilee Day (he would be sure to send his best), each mount would bear his name and address, and this might be supplemented by any remarks in pencil at the back. These views could be classified, and either be put in an album or casket and presented to Her Majesty the Queen. This would form a pretty and grateful offering from a large and widely spread body of gentlemen who represent commercial photography to one of its most liberal patrons—the Queen. Leaving the suggestion in your hands—I am, yours, &c.,

42, Northbrook-street, Newbury, Berks.

THOMAS B. HOWZ.

OUR FATHERS: WHERE ARE THEY?

To the Editors.

GENTLEMEN,—Being engaged on a large historical work, a portion of which includes the portraits of the most prominent Victorian celebrities, I have been endeavouring, in order to give a place to the wonderful invention and development of photography, to procure portraits of three of the following: Fox Talbot, Mungo Ponton, Woodbury, Herbert Hunt, and Hugh Diamond; but up to the present I have not succeeded in even finding the slightest trace, and, further, in making inquiries at many London and provincial photographers and dealers, a look of conscious innocence illuminated their countenances, and a smile of incredulity overspread their faces on the name of Mungo Ponton being mentioned. "Who was he?" they asked, with a "No you don't" sort of expression, evidently regarding the question as an attempt—to use a rather vulgar expression—to take a rise out of them. That Mungo Ponton's name is apparently unknown, even to photographers, is, perhaps, not to be wondered at, as he was so remotely connected with photography. But still, one would have thought that a remembrance of him who discovered the principle upon which is founded the whole of the art of pigment printing, colotype, and kindred processes, would have lingered in the minds of those who practise photography, but lack, apparently, a true interest in the history of their art. With regard to the other portraits, it is scarcely credible that none are on sale anywhere, nor any information obtainable. In making inquiries I have been passed, battledoor-and-shuttlecock fashion, from one to the other, and am at last compelled to appeal to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, who I trust will be able to afford me some information as to where I can procure them. Trusting to be kindly favoured with their valuable assistance—I am, yours, &c.,

PRO CHARLES MARON, G. W. B.

The Studio, George-street, Hull, June 18, 1887.

MEDAL AWARDS.

To the Editors.

GENTLEMEN,—Mr. Lydell Sawyer must not be too hasty, there are two other gentlemen who claim to wear the same head-gear. I congratulate Mr. Sawyer upon being one of the first to put his signature below his insinuations; the insinuations themselves, however, are not of much account. It is possible, and very probable, that the gentlemen of whom he writes have as keen a sense of honour as himself.

I notice that Mr. Sawyer does not venture to repudiate my remarks about those members of the photographic body who pose as reformers in public, but who, when in positions where their support and influence would be valuable, are not to be relied on.

The Parent Society's system is (I agree with Mr. Sawyer) a very good one; but I believe that all its exhibitions are followed by growls and grumbings, showing that no matter how perfect the system some one is found to be dissatisfied. Our Society adopted what I think was a very good rule, and an "element of safety," namely, that no "name was to be permitted on the front of exhibit." This, however, was rescinded at a small meeting held in March, Mr. Sawyer himself seconding the proposition to that effect. Mr. Sawyer also took part in the nomination of Judges.

I don't remember that he raised any objections, or expressed any doubts as to the fitness of the gentlemen nominated.—I am, yours, &c.,

J. PIKE.

16, New Bridge-street, Newcastle, June 28, 1887.

"SECRET PROCESSES."

To the EDITORS.

GENTLEMEN,—I should have been glad if "Monitor" had passed over the blunder he refers to. What I really said at the meeting of the Manchester Society was that I had always freely given information, the only exception being my process for printing on canvas. This I repeat—I said it without boasting, and it was in reply to remarks which were disparaging to professional photographers. Bad reporting I am not responsible for. I saw the blunder in the JOURNAL, but did not think it worth the trouble of correction.—I am, yours, &c.,
A. BROTHERS.
Manchester, June 25, 1887.

Exchange Column.

- Wanted, gem or Victoria lenses in exchange for coloured lantern slides.—Address, R., 8, Cyprus-villas, Garforth.
- Wanted, half-plate lens in exchange for good background by Marion or show cases.—Address, A. B., 859, Holloway-road, N.
- Dark box on wheels for exchange. Wanted, studio stand or head-rests.—Address, W. 10, Medcalf-place, Pentonville-road, London.
- Will exchange Marion and Seavey backgrounds, &c., for a good light 12x10 camera and slides, or anything useful.—Address, F. WEAVER, Lincoln.
- For exchange, two sets of gem lenses, twelve on plate, and nine ditto. Wanted, good quarter-plate or cabinet lens by known maker.—Address, W. LEE, Photographer, Llandudno.
- I will exchange limelight apparatus, four good sets of slides, popular subjects, for accessories, posing-chair, or whole-plate camera.—Address, T. H. PRICE, Dursley, Gloucestershire.
- Will exchange one of Fallowfield's oscillating cabinet hrrnshers, new, cost 30s., for interior background or rntsic accessories.—Address, J. V. VALENTINE, 18, Bank-street, Teignmouth.
- I will exchange an enlarging apparatus, seven-inch compound condenser, for a really, good whole-plate camera and three slides for outdoor work.—Address, W. DAEIN, 1, High-street, Sheffield.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

- G. Watnough Webster, 33, Bridge-street-row, Chester.—Portrait of "Gamecock" and jockey.
- R. M. Campbell, Campheltown.—Three photographs of obelisk monument to the memory of J. F. Campbell.
- James Thomson, 21, High Park-street, Liverpool.—Photograph of the s.s. "City of Rome."
- James Bellman, Victoria-road, Whitehaven.—Group of "The Whitehaven screen girls' deputation to the Home Secretary."
- D. Bordley, Newport-road, Stafford.—Photograph of W. H. Peach, Esq., Mayor of Stafford.
- H. T. Austin, Clifton-villa, Knowle Park, Bristol.—Group of Clergy of Holy Nativity; Portrait of Rev. G. Dunlop.
- J. A. Billinger, Sidmouth, Devon.—Three views of Jubilee procession in Sidmouth.

- AN EXCHANGER.—If you or other correspondents desiring exchanges are so careless as not to write your names and addresses correctly, that is your affair, not ours.
- S. W. A. asks which process will yield the best copy of a Daguerreotype: gelatine or collodion?—The one is as good as the other; it is simply a question of skill.
- A TWELVE-YEARS'-OLD CORRESPONDENT.—See Monckhoven's *Treatise on Optics*. Failing that, try *A Treatise on Optics*, published by R. & W. Chambers. See also Brewster's *Optics*.
- J. COURTIER.—The probable cause of the veiled appearance of the negatives, after intensifying by the bichloride of mercury and ammonia method, is that the plate was insufficiently washed between the operations.
- SALTED PLAIN PAPER.—W. R. Ridgway & Co., Ealing, London, say that with reference to our article on this subject, they have been supplying the same for some time. We refer those of our readers interested to them.
- COLOTYPE.—We have not received the paper referred to. You will find formulæ and method of preparing the plates in the last edition of Hardwich's *Photographic Chemistry*. It would take up too much space to give it in this column.
- W. WOOD.—1. The proportion of sulphite of soda has nothing to do with the quantity of water but of the pyrogallic acid. To each ounce of pyrogallic from four to six ounces of the sulphite are usually added.—2. Either will answer.—3. No.
- C. A.—Your best plan will be to write and complain to the one who supplied the goods to you. It is no use your communicating direct to the manufacturer, even if you know who he is, as you have had no transactions with him—you are not his customer.
- E. B.—It is impossible for us to indicate the cause of the spots. They look, however, very much as if they were caused by minute bubbles of air adhering to the surface of the paper while it was in the fixing bath. But we should be sorry to say that they are really due to this. Is the water you are using highly charged with lime?
- A.—Those who manufacture the ready sensitised paper do not publish the formulæ they employ, but look upon it as a "trade secret." Various formulæ have from time to time been published, but, so far as our experience goes, none of them will give results, as regards toning and keeping qualities, equal to the best papers met with in commerce.
- A. PARKER.—From this correspondent we have received a couple of prints on opal glass, and he wishes to know the reason they are of such a cold tone, while those supplied by professional enlargers are much warmer.—The reason of the coldness of tone is due to the pictures being under exposed and too much forced in the development. The remedy is obvious.

W. B. CASSINGHAM writes: "Are dry plates thickly coated better than thin ones? if so, what are the advantages of thickly coated ones? An answer will oblige."—Plates rich in bromide of silver are better than those which are but thinly coated, as they give a more "plucky" picture and are freer from halation. Beyond a certain point, however, no advantage is gained by an extra thick coating.

LEONOR STEINER writes: "I have been trying to colour some photographs for enamelling, using oil colours with a little turps, but to my great disappointment, when they have been enamelled, enamel and colour both peel off. Will you therefore tell me what I should do to prevent it?"—Perhaps some of our readers who have had experience in this direction will supply the desired information.

T. EVANS sends us some specimens of enlargements on gelatino-bromide paper which he has made, and asks the cause of their weak and fogged appearance, as he has kept strictly to the formula issued by the Eastman Company.—The cause of failure arises from over exposure. In his next essay our correspondent should try half the time previously given, with the same negatives. If with this exposure he does not obtain sufficient vigour he must try still less.

ELLEN.—The thinness of the negative is due to its being very much over exposed. About a fourth the time, or even less, than that you gave would have been sufficient. Your best plan will be to take the subject again; next to that we should advise you to make a transparency, and from that make a fresh negative, exaggerating the contrasts in each operation. The negative is too much over exposed to make anything good of it by any method of intensification.

S. S.—We have not tried the material mentioned, so cannot give an opinion as to its merits. The common gilt frames are not prepared with bronze powder, so that there is no fear that any will become detached and eventually injure the photographs. If the "washing" is simply the water in which the prints are washed prior to toning, common salt will precipitate, the silver as a chloride. But if they contain hyposulphite of soda, sulphide of potassium (liver of sulphur) must be employed.

H. R. H. says: "1. I have a tub which I got from a grocer (i.e. a salt butter tub), which I wish to use for washing negatives. I find I cannot get rid of the salt which the butter has left in the wood. Will it injure the negatives if the washing water contains a trace of the said salt? 2. Can photographs be taken in the streets of London without fear of one being moved on by the man in blue?—3. I have a plate box which has been varnished inside with spirit varnish: is it injurious to dry plates? It smells strong of the varnish."—1. The salt can all be removed by long soaking in water. A minute trace of the salt such as would remain after this treatment will do no harm.—2. Unless an obstruction to the traffic is caused, the police will not interfere.—3. If the box be left open in the sun for a time the smell of the spirit will fly off.

T. B. LATCHMORE writes as follows: "Observing in the *Standard* yesterday (June 23) an account of a disastrous fire which broke out at Messrs. Dale & Co.'s chemical works, and which was attributed to an explosion of a quantity of bichromate of potash, I must say that I was not at all aware that the chemical in question was of such a dangerous nature as to be liable to explode and cause so much damage to life and property. Is there not some error in the printing? If not, we photographers must be careful as to the quantity and storing of bichromate of potash."—In reply: The daily papers appear to have got considerably "mixed" over this affair. Some have attributed the catastrophic to one thing and some to another. At present the cause is a mystery, which will probably be solved at the inquest. One thing is certain, namely, that bichromate of potash is not an explosive salt, although some of the potash salts are, the picrate for example.

RECEIVED.—"More Light;" Price List of Cameras, Lenses, and Apparatus, by George Houghton & Son.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—There will be an excursion to Shepperton on Saturday, July 2. The train leaves Waterloo at thirty-five minutes past two p.m.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, July 6, 1887, will be on *Actinometers*. Saturday outing at Shepperton. Train from Waterloo at thirty-five minutes past two.

LONDON STEREOSCOPIC COMPANY'S EXHIBITION.—The Secretary of this Company desires us to notify the fact that Captain Abney is to be one of the judges at their forthcoming exhibition. He says further that the Company will be glad to send to applicants the rules and regulations concerning this competition.

On Friday, June 24, Barnet was favoured by a visit from a very charming specimen of Royalty in the person of the Princess Feodora, the eldest of the Queen's great-grandchildren, the young Princess making a short stay at Hadley Hurst, the residence of Wilbraham Taylor, where the planting of a tree took place, and some excellent photographs were taken of this charming little Princess by Alfred Alonz Ferrari, of the Art Studio, High Barnet.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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TONING GELATINO-CHLORIDE PRINTS WITH SEL D'OR.

SOME recent experiments in toning with the preparation formerly sold under the name of *sel d'or*, are strongly suggestive of the existence of a greater difference between the images produced upon gelatino-chloride and albumen papers respectively than we are in the habit of suspecting.

As is well known to all who have employed gelatino-chloride paper, a special toning bath is necessary, or, at least, it is requisite to compound a solution differing entirely, both in strength and composition, from that employed for albumenised paper. The ordinary alkaline bath in everyday use produces not the slightest toning effect upon the new paper, unless it be left for such a prolonged period that the lights become hopelessly discoloured. It is only when the proportion of gold is vastly increased—one grain of the salt to two or two and a half ounces of water—that toning proceeds with anything like celerity; but the best results are not gained until a considerable quantity of a soluble sulphocyanide—and, in some cases, a trace of our old enemy, “hypo”—are added to the bath. In fact, gelatino-chloride paper appears to work better under conditions approaching those of sulphur toning.

Such being the case, it is scarcely surprising that when, a few days ago, we fell across a small capsuled, stoppered bottle of *sel d'or*, the idea should strike us to try it upon the new paper. Despite its great antiquity—the preparation was of the well-known Fordos & Gelis brand, and must have been a quarter of a century old—the salt appeared to be in perfectly good condition. It was made up into a toning bath by dissolving the contents of the bottle (one gramme) in thirty ounces of water, and rendering the solution faintly acid with hydrochloric acid. In adopting these proportions, we may add we worked entirely from memory.

Several prints upon gelatino-chloride paper, as well as two or three upon ordinary ready-sensitised albumen paper for comparison, were thoroughly washed and treated with chloride of sodium, in order to remove every trace of free silver. Upon immersion in the *sel d'or* bath, the gelatino-chloride prints commenced to change colour in two or three minutes, and then, proceeding rapidly, were fully toned to a rich purple-black in about five or six minutes. The albumen prints, however, refused to tone at all, and even after sixteen hours immersion had not changed colour in the slightest degree.

We were quite unprepared for the latter result, though by no means surprised at the difference of behaviour between the two kinds of paper, for in previous experiments we have frequently found not only that an alkaline bath which will colour an albumen print rapidly will produce no effect whatever on a

gelatine picture, but that a solution which is strong enough in gold to act energetically upon gelatine will have little or no action on the other. In fact, acidity or the absence of alkalinity of the bath appears to favour toning in the case of gelatine paper, and the reverse in the case of albumen.

But to return to our toned prints. These, after removal from the bath of *sel d'or* were placed to soak in clean water. Be it noted here that there was no chance of free silver being present at any stage to account for the result we are about to record. To obviate the possibility of the formation of hyposulphite of silver by the action of the *sel d'or*, the prints were treated as we have stated, with salt, in order to convert any free silver, and fresh water was employed at every stage.

When the prints left the toning bath, their appearance was in every way satisfactory, the tone possessing that velvety purple character so well known in connection with gelatino-chloride at this stage, while the lights were perfectly bright and pure. On turning them over, however, after a few minutes' soaking, we were horrified to find them, without exception, changed to a deep, dirty yellow, highly suggestive of sulphuration in its worst form, and of just such a degree and character as might be anticipated if a print containing free silver were placed direct into the hypo bath without previous washing.

The albumen prints, it may be here stated, were entirely unaffected in this manner, the whites remaining as pure after several hours' immersion, and also after washing, as at first, the toning bath, in fact, apparently exercising not the slightest action of any sort.

Cogitating on the matter, we remembered that the addition of hydrochloric acid was made to the bath in former days for the express purpose of avoiding a similar yellow stain, but we could not recollect the exact proportions. We had employed just sufficient to turn the scale of neutrality, and this probably was not sufficient. Upon turning up an old formula we found that our proportions of gold salt and of water were correct, but that one *drachm* of pure hydrochloric acid should have been used instead of, probably, one *minim*.

The correction was made, and a fresh batch of prints were toned, being subjected to the same precautionary treatment as previously to guard against free silver. The toning proceeded as satisfactorily in every way, and the final result was precisely similar to that already described—hopeless discolouration, commencing in one or two instances in this batch of prints in the toning bath itself. The yellow colour, moreover, was found to deepen considerably when the prints went into the fixing bath of fresh hypo.

In the second or more acid bath albumenised paper prints were equally unaffected both as regards toning and sulphura-

tion, and it is this marked difference in behaviour which causes us to question whether there may not be a greater difference in the constitution of the gelatino-chloride film, as compared with albumen, than we have hitherto supposed. The yellow stain is quite invisible from the *back* of the print, and is, indeed, found to be confined simply to the gelatine itself, since, if the latter be dissolved off with warm water, the paper is left perfectly white.

A possible explanation suggests itself to us, namely, that the contact of free silver with the gelatine, in making the emulsion, forms an organic compound which is acted upon—sulphurised, in fact—by the *sel d'or*. If this be so, it is a strong impeachment against gelatine as the basis of printing surfaces—at least, where it is necessary to employ free silver, as for papers for “printing-out.” We have not yet submitted the prints to any tests, but shall shortly do so.

THE RIGHT TO THE NEGATIVE.

THE letter of Mr. Arthur Debenham, which appeared in our columns some time since, has given rise to a large amount of correspondence with reference to the sitter's alleged right to the negative. Some of the writers have expressed a very decided opinion, because a higher charge is made for the first supply of portraits than for subsequent copies, that, consequently, the negative is the property of the sitter. Others, on the contrary, consider, according to the usage of business, it belongs to the photographer. Many of the arguments adduced, and analogies quoted, have scarcely been to the point, as they have had no bearing on photography or the established custom of photographers. It is tolerably well known in Courts of Law, that in any disputed point a well-recognised rule or custom in any particular trade or business transactions is looked upon as being nearly, if not quite, equivalent to law itself.

It is a very common circumstance, whenever the question as to the proprietorship of the negative is under discussion, to quote the case of an engraved plate. In the case of works of art the simile certainly does not apply to photography at all, inasmuch as the engraver's is a separate business, and so is the printer's. The former engraves the plate, but does not supply impressions therefrom. In the case of address or business cards it is somewhat different, but here a definite charge is made for engraving the plate; or sometimes the agreement is for a card plate and so many cards for a certain sum. In any case the custom of the trade is that the plate for which a specific charge has been made is the property of the customer. But when a similar order is executed from type, the “forme” does not become his property, although a proportionately much higher charge, to cover the cost of setting up, is made for fifty than for five hundred or a thousand impressions. It has been argued, because the forme can be broken up, and the type used for other purposes, and the plate is useless except to the customer, that the latter should be his property and the former not. To meet this, opponents have argued that the engraving can be removed and the copper re-engraved. Also that the negative can be cleaned off, and the glass and silver utilised, like the type, for another purpose. This is simply special pleading, and has no legal value whatever.

Let us now turn to the business part of the question, and see what has always been the custom of the trade as regards negatives taken in the ordinary course, and also what has legally been decided with reference to their ownership. Going

back to the Talbotype days, when one or two portraits were about as many as were ever ordered at a time, the negative always remained the property of the photographer.

In the days of the collodion process we find the negative recognised as belonging to the photographer. In the very early period of that era it was usual to have on the printed receipt for payment for sittings an announcement something like the following:—The negative will be retained for twelve months—or other time—during which period copies can be had for so much, usually half price. Here is tacit understanding that the sitter had no title to the negative. One firm we have in our mind just now, who had several establishments in London as well as in the provinces some thirty years or so ago, used to have a paragraph in their prospectus stating that the negative would be kept for a certain number of months, during which time duplicates could be obtained at such and such a sum, or the negative might be purchased for half the price charged for the first portrait. Here again is a distinct understanding that the negative belonged to the artist, and could only become the property of the sitter by purchase.

Later on, when the *carte-de-visite* came into vogue, and portraits were ordered by the dozen instead of singly, we find the custom then was not to destroy the negative at the end of a given period, but to keep it indefinitely; hence the intimation on the backs of the mounts, “The negative of this portrait is preserved, and copies may be obtained at any time by quoting the number.” How could copies be supplied if the negative were not the property of the photographer? Here is another proof of the recognition that the right to the negative belongs to the photographer. Mr. Silvy, when he retired from business in this country, advertised in the daily papers that any of the negatives he had taken could be purchased by the sitters for a certain sum, and that any photographer could print therefrom. As a matter of fact, the sitter bargains and pays only for portraits, and not for portraits and the negative from which they are made; and the custom of the trade is, and always has been, that he is in no way entitled to it except by special agreement.

Evidently the title of photographers to the negative is recognised by the framers of the later projected copyright bills, who, by the way, are not supposed to be particularly favourably inclined towards the craft. One of the clauses stipulates, that when a portrait is taken for a valuable consideration the photographer must not use the negative for any purpose of his own, or make copies therefrom, except to the order of the sitter. Here, by implication, the negative is admitted to belong to the photographer.

Having considered the question from the “custom of trade,” or unwritten law, point of view, let us now turn to what has already been legally decided on the point. In 1880, Mr. Dixon, of Albany-street, sued a pianoforte-maker in the County Court for the sum of four pounds for two proofs and the negative itself of a pianoforte he had photographed. The claim was resisted on the ground that the negative should not be charged for. The Judge, however, was of a different opinion, and said that “the defence set up could not be maintained, for the negative of a picture was the most valuable property in it, as by it the defendant could have copies printed by another photographer elsewhere.” Judgment was accordingly entered for the plaintiff for the full amount claimed. Clearly, in this case the negative belonged to the photographer by right, otherwise he could not have recovered its value.

Here is another case in which the right to a portrait nega-

tive was contested, and the decision leaves no doubt on the point. The case was tried in the Bloomsbury County Court in 1876, and will be found reported on page 359 of our volume for that year. Briefly the case was this: The plaintiff, a photographer, sued the defendant for thirty shillings, the price of a dozen cabinet portraits of his wife, which had been duly supplied and approved of. Here is the defence and judgment.

"The defendant did not deny the order being given, nor that the charge made was a reasonable one, but declined payment on the ground that the order had not been completed, inasmuch as the price charged included the purchase of the negative, from which, as he was going to India, he might get additional copies printed if he required: moreover, the defendant said he strongly objected to leaving the negative in the possession of the plaintiff, as he had no wish to see his wife's portrait exhibited amongst the plaintiff's specimens, which photographers were in the habit of doing when they took an attractive picture. The defendant's wife was called, who corroborated her husband's statement. The plaintiff, being recalled, stated that the purchase of the negative was never mentioned, and that it was always customary to keep negative unless some special arrangement was made for its delivery to the sitter. The Judge considered that no respectable photographers would exhibit their clients' portraits without permission being obtained, and, as the present defendant had not proved the purchase of the negative, judgment would be in favour of the plaintiff for the full amount claimed, with costs of two witnesses."

Although the above are only County Court judgments, they stand as a precept until they are overruled by a reverse decision in one of the superior courts.

RESPECTING the Photographic Convention, a writer in the *Scottish News* remarks:—"Unostentatiously enough, but with all heartiness and cordiality, the Photographic Convention was opened last night in Glasgow. In its own way, the Convention—the second of its kind—is of considerable importance. From all parts of the country, some two hundred practical photographers have come together to discuss subjects in connection with the art of photography—an art whose progress can only be compared to that of the appliances of steam for practical purposes, or that of the mysteries of electricity. Half a century ago photography was in a very crude and primitive condition, but it has advanced with the times, and now it ranks next in beauty and importance to the divine art of painting itself. A Convention such as that which opened its proceedings last night in Glasgow is not likely to pass away without good results where there is such a combination and diversity of talent and ingenuity. Besides, it is well that there should be a recognition of the kinship betwixt those that are kin. The Convention in Glasgow will also have this advantage to strangers: its proceedings and the incidental excursions into the picturesque classic districts with which the country abounds, will give them a glimpse of certain beauties of nature hitherto, perhaps, unknown to them, and which their art will enable them to perpetuate."

ELECTRIC lighting is, perhaps, about the last thing in the mind of the average photographer at this period of the year; but as there are some establishments where it is *de rigueur* all the year round, we need not forbear from echoing the wail of several owners of studios, which has been very common for the last few weeks. "We are simply baked, sirs; if we could only get electricity at a reasonable figure we would shut up our studio and take portraits in a cellar." And, of a truth, the "electrical photographer" has a very strong pull against his daylight brethren of the camera in the matter of weather. In summer there need be no more heat than in an ordinary drawing-room, in winter the effect of a foggy atmosphere is greatly minimised, while all the year round he always has a sufficiency of illumination, whatever the meteorological conditions that may prevail.

Apropos of electricity, a very singular danger may be noted. We have heard of serious accidents to the person through electricity, and its possible danger to buildings has long been recognised; but that

there was danger in an incandescent lamp was a thought that would have occurred to few. The well-known electrician, Mr. W. H. Preece, however, calls attention to such a danger, and describes the actual occurrence (an account of which he had received from a correspondent) of an accident caused by the bursting of a 50 c.p. lamp the moment it was connected up for the first time, the glass breaking in his face and filling his eyes with glass dust. Mr. Preece offers as an explanation that there was a slight air leakage in the glass, and a consequent formation of an explosive compound with the residuum of hydrocarbon gas used in exhausting.

It might have been anticipated that the failure of the radiometer to effect a practical service in photography was complete and final, but our contemporary, *La Nature*, which often devotes a considerable portion of its space to matters photographic, has lately resuscitated and republished a paper by M. Olivier presented to the Academy two years ago on the subject of measuring the chemical action of radiations. The plan consists, in brief, of surrounding a radiometer with screens permitting only the chemical rays to pass, placing the instrument so screened in front of the camera, and counting the revolutions made during a correct exposure. M. Olivier states that a similar number of revolutions on any other occasion will, whatever the light, indicate an equivalent exposure, provided the same kind of plate be used. He quite ignores the possibility, not to say the probability, of the light from the sky facing the radiometer being very different from that facing the object photographed. The editor of *La Nature* further points out that the time when the sun is near the zenith is most suitable for employing this modified instrument. Be the value of these objections what it may, we read, nevertheless, that a special radiometer for photographic use is made by Mr. Leguy, and that since the publication of M. Olivier's method upwards of three hundred photographers have adopted it for measuring exposures.

It is often said that the time is long gone by when a pure white sky was considered a most desirable and excellent achievement in a photographic landscape; but in the introduction of clouds there is yet much room for improvement, and the employment of dry plates, which so often permit of the production of clouds and landscape at one exposure, is by no means an unalloyed benefit. It rarely happens that the printing value of sky and landscape on one negative is equal, and the consequence is the production of a sky which, though a vast improvement upon pure white, is still a long way from nature. The use of special negatives for printing-in skies should not be permitted to fall into desuetude, and we would strongly advise every photographer to become possessed of a few "practical" clouds. There need be the less fear of their representing facts falsely, whatever distance apart the cloud and the landscape negatives may have been originally obtained, seeing that, in papers recently read before the English and Scottish Meteorological Societies by the Hon. R. Abercromby, the forms of clouds are shown to be identical in all parts of the world.

Of the many treatises upon the subject of Light, technically or popularly treated, now before the public, one of the most attractive of the latter class is the series of Burnett Lectures upon Light by Professor Stokes, the last of which has been given, and is recently published in book form by Messrs. Macmillan. It treats of many topics interesting to the scientific photographer in a most pleasantly instructive manner. The subject of the photo-chemical theory of the action of light upon the eye, including an excellent, if brief, description of the visual-purple theory, may be particularly noticed; and, indeed, the whole lecture (III.) in which these subjects are treated is well worthy of perusal by all photographers.

We have more than once, when alluding to thermometrical observations, called attention to the liability to incorrect readings through the use of imperfectly graduated instruments, or such as had undergone some change, or possibly, molecular alteration. In many photographic operations a difference of a degree or two is of little moment; but when important processes are described the otherwise useful data are apt to be of little value if temperature observations are recorded, and the instrument employed has not been compared with some standard

thermometer. Let us take, for example, the manufacture of pyroxyline—a difference of two or three degrees in the temperature of the mixed acids is capable of materially altering the properties of the resulting product; and many similar cases could be instanced. Of the extent to which thermometers may mislead, when in the hands even of professed observers, an extraordinary instance has recently been given by the newly appointed Government Meteorologist of Queensland, Mr. Clement L. Wragge. In making a round of inspection, this officer discovered at Cookstown—a station of the first class—a spirit thermometer which, owing to the volatilisation of the spirit, had the enormous error of fifteen degrees! It may here be noted that, as many self-registering minimum thermometers are alcoholic and placed in a horizontal position, it is always necessary to observe, when taking a reading, whether there be any spirit in the upper part of the tube, which is very commonly found to be the case.

We think our readers will be surprised to learn that “Cameras without lenses are becoming quite common in France, especially among amateurs and tourists.” It goes without saying that it is an advantage to the photographer that there is “no outlay for a lens and no fear of breaking it or the ground-glass, which is discarded as well.” But that, “independently of those considerations, photographs of objects can be readily obtained which few lenses would take in,” that “they can, moreover, be taken more accurately,” will, we imagine, intensify the feeling of surprise which any of our readers will experience who saw the above statements in the *English Mechanic* for the 1st of July.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

THOSE who hazarded the opinion, or indulged in the hope, that the Glasgow meeting of the Photographic National Convention was to prove a success, have certainly not been disappointed. The local enthusiasm is unbounded; the energy displayed unprecedented in the, as yet, brief history of photography. The pictorial display on the walls of the Institute of the Fine Arts are unmistakably more attractive than anything we have yet seen on those of the Gallery in Pall Mall during the Exhibition of the Photographic Society of Great Britain, while as to the Apparatus Department of the Convention, we venture to state that, both as regards quantity and quality, the Glasgow exhibit stands altogether unrivalled. From north, south, east, and west, the members are, at the time of our writing, pouring in, among them being several ladies. The number of papers contributed up till Monday midday reached the goodly number of *eighteen*, and still more are expected.

In these Art Galleries where the meetings are held, are comprised everything that could conduce either to comfort in the public meetings or the display of pictures and apparatus, together with suites of rooms specially devoted to ladies, smoking room for gentlemen, and writing rooms for those who have occasion to make use of them. So far as we have seen up to the despatching of this article, London is well represented; Birmingham, Derby, Manchester, Dundee, Wick, Kirkwall, Belfast, Dublin, are also all represented. Glasgow and its suburbs, as might be expected, are in strong force. The adjoining city of Edinburgh does not yet appear to have been pervaded by the enthusiasm which otherwise universally prevails to the extent anticipated, which is to be regretted, because that quiescent city of law and learning musters among its citizens several good men. We have, however, recognised at least two members of the Society present.

On Monday evening, at six o'clock, there was a meeting of the General Council, at which the details of the Convention proceedings were arranged. At eight o'clock the proceedings were formally opened.

A few minutes before eight the hall was filled with a large number of ladies and gentlemen, and the chair was taken by Bailie Crawford, who expressed regret that the Lord Provost, Sir James King, who was to have inaugurated the proceedings, could not attend. He, along with Lady King, was in London, assisting at the important function of laying the foundation stone of the Imperial

Institute, a function from which he could not absent himself, being a member of the organizing committee. His lordship, however, had written to him, charging him to welcome the members of the Convention to Glasgow in the name of the citizens, and in his own, and to hope that the important meeting which they were holding here would be a very pleasant and a very profitable one, and that at the end of it they would have no reason to regret having chosen Glasgow as the place in which to hold their second Convention. (Applause.) He understood that the Convention was composed of amateurs and professionals—those who were engaged in photography, and those who had an interest in it—throughout the United Kingdom, and that their object in meeting was to exchange notes, relate experiences, and discuss the later and more difficult points in connection with that most progressive of all arts and industries—photography. Looking at the programme, and seeing that it consisted mostly of excursions to some of the most delightful places in the West of Scotland, he began to wonder where they did their business. However, although it might seem that a considerable portion of their time would be spent, during the week, in what might be called pleasure, he, for one, was of the opinion that that particular part of the proceedings would not be the least valuable to the members. Indeed, he thought the moving about of members amongst each other, taking opportunities for exchanging ideas, for private talk, for comparing experiences, and for getting thoroughly acquainted with each other, would perhaps ultimately be the most beneficial part of the whole proceedings. (Applause.) Photography was not altogether lost sight of in Glasgow. He did not know how it might compare with other places in this respect, but to judge from the amount of rivalry—friendly rivalry, he hoped—which he saw around him among photographers, and the interest taken in it by amateurs, he imagined that Glasgow was entitled to hold a very fair position in the photographic world. (Hear, hear.) He was glad to see that the Convention had been able to organize a most interesting, instructive, and complete exhibition. In the International Exhibition of 1888 at Glasgow, the Fine Art Committee had decided to have a separate section, but in connection with the Fine Art Department, for photography alone—(applause)—and in that section they proposed to deal with photography from its purely artistic point of view, not touching at all on the various methods of production, on the apparatus, or on the chemicals used. As Mr. Lang was the convener of that Committee—a man full of energy and resource—and as he would be assisted by a number of other gentlemen in Glasgow who were thoroughly qualified, and who no doubt would receive the co-operation of others throughout the United Kingdom, he looked forward to the Exhibition being a triumph for the photographic art. (Applause.)

Mr. J. Traill Taylor, Chairman of the Council, remarked that how wisely and how well the Convention had acted in selecting Glasgow for their meeting this year, was amply demonstrated by the success which had attended it. He then announced that up to the present he had received notice of eighteen papers on technical subjects which were to be submitted to the Convention. They were on very varied subjects, ranging from experimenting to copyright, and from home portraiture to the latest methods of taking portraits in natural colours, real or pretended. (Laughter.)

On the motion of Mr. Lang, seconded by Mr. Briginshaw, a hearty vote of thanks was awarded to Bailie Crawford for his conduct in the chair. The Chairman acknowledged the compliment, and afterwards declared the Convention opened for business.

The room was then darkened, and a variety of views were exhibited by means of the lantern, Mr. Pringle describing them in his usual racy manner. The views consisted chiefly of the parts of the country to be visited by the members of the Convention. There were a number of excellent views on the Clyde, with shipping, by Mr. Armstrong, and a number from the Trossachs by the same gentleman and by Mr. Watson. Some beautiful microscopic slides and scenery, taken by Mr. Pringle and also by Mr. Wellington mostly during last year's Convention, were likewise exhibited. The whole exhibition—a most interesting one throughout—concluded with a display of microscopic objects taken by polarised light by Mr. Briginshaw.

Before the proceedings were terminated, the arrival of the evening trains from the South brought a considerable accession to the numerical strength of the Convention, among the late arrivals being Professor

Herschel, F.R.S., President of the Newcastle-on-Tyne Photographic Association.

On Tuesday there were two excursions, one to the Falls of Clyde, under the conductorship of Mr. George Bell, the other to the Trossachs and Loch Katrine, Mr. T. N. Armstrong acting as conductor. A large party went to the former place, where, notwithstanding a severe thunderstorm which was experienced, numerous negatives were taken. But the locality which proved to possess most attraction for the majority of the Convention was the Trossachs and the adjoining Loch Katrine. But as our Special Correspondent was making notes of the various incidents which occurred on this department of the excursion, he will doubtless have something to say concerning it in another number; suffice it for the present to say that the rugged pass of the Trossachs was never before invaded by such an army of "camera men" as on Tuesday.

The ladies of the party having been left at the boathouse at the head of the loch, the dark and, in a former period, deathly and dangerous defile was re-entered. By the thoughtful care of our guide numerous tit-bits of glorious scenery never dreamt of by the ordinary tourist were pointed out, and at certain places something like fifty or sixty cameras of every conceivable form and dimensions were to be seen directed towards mountain, torrents, waterfalls, ravines, and rocky defiles, never before laid under such artistic contribution. Nature was at her very best for the photographic capture of such scenery. A little later the invaders had taken possession of the upper end of the sinuous Loch Katrine, and artistic toll was levied to a fearful extent on its mountainous and lovely banks.

In the evening there was assembled a large audience to hear the reading of papers. This meeting was presided over by Mr. John Stuart, who had only that morning arrived from a visit to Norway. As President of the Glasgow Photographic Society he, in the name of the local photographers, endorsed the welcome that on the previous evening had been extended to the visitors by Bailie Crawford, acting for the Lord Provost. They had all tried their best to make things comfortable and pleasant for their visitors. How far they had succeeded it was not for him to say. The following papers were then read:—

FINDERS AND FOCUSERS.

By LYONEL CLARK, C.E.

COULD one have known Daguerre's thoughts whilst he was sitting with whitewashed face before his camera, patiently waiting for the sluggish plate to delineate his features, we should doubtless have found that he was building aerial castles where exposure was reduced to a minimum, and, indeed, we know how hard he and his successor, Dr. Victor, worked in the direction of improving the rapidity of their sensitive plates. In fact, ever since the discovery of photography, experimenters have been striving to improve in this direction, and there are few commercial brands of plates now made but that are too rapid on open subjects for hand exposure, and some form of shutter is a *sine qua non* with all photographers. But remembering the old adage, although it is an easy thing to get shutters and plates for the most instantaneous kind of work, it is not quite so easy to catch your object. By the time you have focussed and got your back in, slide removed, and shutter set, your subject may be a long way off. In the case of a passing express, the 4.5 problem of Euclid for the tyro amateur, it is easy enough, you can do all that beforehand and await the arrival of the fiery Pegasus, but all animate or moving objects do not run on rails, but have to be followed and taken at any moment. Even at the Zoo, where the denizens are decidedly limited as to recreation ground, it is a constant enough fact to find, after the plate is developed, that the animal is not in focus, or else his tail or head are wanting. In the case of ships and yachts, how often do we see a good picture spoilt owing to the want of a few feet more bowsprit or the peak of the topsail. Of course, with any of the ordinary finders, this should not happen, and as yachts are virtually all taken at about the same distance, the focus does not come in as a factor, for a fixed focus and a small stop brings everything sharp. But in the case of animals, where, perhaps, a portrait lens with small depth of focus must be used, and where the subject is well within the focal variation of the lens, this plan does not work.

Some cameras are marked for foci of varying distances, but this is open to many objections. You have first to train yourself to properly judge the distance, and then you have to rapidly change the eye from the finder to the marks and back again, and it is more by good luck than by skill that you get a successful picture. Men like Mr. Dixon, who

make a speciality of animals, have boldly gone in for double cameras and double lenses, and this plan is without doubt the most effective; but it is expensive and extremely cumbersome, and quite prohibits its general use, for no one could make a point of carrying about two cameras because he might get some instantaneous work. Some time back I tried using a telescope, and marked off the focal lengths to correspond with similar marks on the baseboard of my camera, but soon dropped it, as I found it very inconvenient and required two persons to use it properly. Later on I utilised for the same purpose that scientific toy called the walking-stick telescope. This, as many of you doubtless know, consists of an objective which is clipped on to the walking stick, and can be slid up and down on it, and a plano-concave eye-piece, also fastened on to the stick, thus forming a Galilean or opera-glass style of telescope, and is really of more or less practical use. I screwed an objective of the same focal length as my lens on to the front of my camera, on the back or sliding portion I fixed an ordinary focussing glass with a piece of ground-glass cemented on; subsequently I discarded the ground-glass and substituted a small wire to focus on. This apparatus was adjusted to the camera, and, of course, the two objectives being of the same focal length, when the top one was in focus, the bottom one, that is, the camera proper, was also in focus, and this held good for every position of the object. There was, I believe, nothing new in this. Mr. Traill Taylor described such a focuser at the Conference last year, and Mr. McKellen also made a similar one, and, moreover, I believe it has been described at a much earlier date. The drawback I found was that it only gave you a very small portion of the subject, and you were obliged to have a finder at the same time, and the changing from one to the other I found by no means easy to manage.

Last summer I was rigging up a camera specially to take some puppies and kittens, and had intended rigging up a second camera on top of the first. On working out the designs, I at once saw that by far the simplest and easiest method was to utilise the ground-glass of the camera proper, since it could not be required at the time of exposure. I simply turned up the screen then till it stood vertically above the top of the camera, and in a plane of course parallel to the plane of its usual position. On the front of the camera I raised up an extra front above the existing one, and fitted into it a lens of the same focal length as my objective; this lens was in a sliding tube. I now had the framework of a second camera on top of my first one, and throwing a focussing cloth over the whole, I got an image on my upturned focussing screen. To adjust this, I first focussed very accurately the bottom camera, the screen for this purpose being of course turned down on some object. I then, without shifting the camera, turned the screen up, and clamped it there with some brass pieces, and then slid the tube of the upper lens in and out till I got the same object sharply focussed on the screen in its upper position. Now the two cameras, or rather camera and finder, coincide, and of course as I rack out the one the other follows; and the foci of the two lenses being equal, whenever an object is sharp on the turned up screen I know that it is also sharp on the plate with double back below. There is no need to be particular as to the lens used for the finder—even a spectacle lens will do; but this is objectionable where your lens proper is of a longish focal length, as the spectacle glass is totally uncorrected for spherical aberration, and gives a more or less sharp image over a great depth of focus; a single landscape lens, but with the stops removed to give as much light as possible, is undoubtedly the best, except you go to the expense of having twin lenses.

Although the focussing cloth does extremely well as a makeshift, yet in the case of wind something more is required. I have a sort of cardboard body, that folds like one of Ottewill's old collapsing cameras. This is made in the form of a truncated pyramid, it slips with an elastic band over the tube of the finder lens, and so gives the play required, the other end comes over the focussing screen and projects like a box a little way beyond it, and gives the necessary shade to it, so as to allow the image to be seen. Many other ways of covering in the finder will doubtless present themselves to you—a body like a Chinese lantern would do, or even an old bellows, though somewhat more bulky; for you must remember that it is not at all necessary to keep out all light, indeed it is surprising how much you can see with nothing between the eye and the ground-glass.

As to the manner of retaining the screen in its upright position or of fixing on the false front, it is impossible to give any strict directions, cameras differ so in construction, but it requires but a small amount of ingenuity to devise some method. I may add that I have for my small camera a focussing eye-piece which is kept pressed up against the ground-glass, being held in position by a spring; this leaves me both hands free to hold the camera and focus, &c., and at the same time permits me of getting, if necessary, a most absolute focus. I have found this little arrangement of focuser and finder, which I described and showed at a meeting of the Camera Club last October, of the very greatest use and benefit. I always carry it about with me, for it at least has the merit of neither adding anything to the bulk or weight of your kit, although at the same time you have all the advantages of a double camera.

Mr. S. D. McKellen said that anterior to Mr. Clark's having submitted this method of focussing to the Camera Club, he, the speaker, had obtained a patent for a system of focussing in which was embraced that now described.

CONCERNING STEREOSCOPIC PICTURES.

By W. M. ASHMAN.

THE renewed interest evinced of late in methods of procuring stereoscopic rotundity in photographic presentments, appears to the writer likely to prove of such beneficial importance to professional workers and dealers in the material used, that reference to the subject will not, I feel sure, be altogether out of place among the topics ranged for profitable discussion at the Convention meetings.

That photographers who depend for sustenance upon their financial successes in the practice of the art have suffered severely from the general depression—and possibly other causes—is now an open secret, and if the signs of recovery are not entirely wanting they are at any rate a trifle obscure and undecided in their character. The best, or an effective, method of circumventing the machinations of the enemy whose identity is so difficult to trace, is the problem which a good sprinkling of the population (photographic) would like to solve.

Doubtless the section of photographers whose interests have been unintentionally imported into these jottings will be supported by abler exponents than myself. I therefore refrain from further remarks in that direction, and pursue the theme which possesses the possibilities of a successful future.

Perhaps some members of the Convention now present have had a large experience in the commercial production of stereoscopic photographs, especially as far back as in the fifties and early part of the sixties, and these gentlemen might possibly add the valuable hints gained in their practical acquaintance with the work to the volume of information disclosed by our good friend Taylor in the last BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, then we may see the stereoscope in every household long before the nineties are reached. Of this I feel confident, that if such additions are not made to the knowledge already so freely distributed, then it must be assumed that there is nothing further to be said about the matter.

There is one point which has impressed itself upon the writer rather strongly in connection with the subject of making stereoscopic slides, which, under suitable circumstances, might very probably prove of exceptional value as a commercial speculation, and that is the photographic representation of family and other groups in *natural* positions. Successfully achieved, such a style of presenting portraits would certainly be appreciated, and, in all probability, supplant the flat-looking, very-much-thrown-together-and-heaped-up mass of inanimate form sometimes designated a family group likeness. Whether such a dire catastrophe would indeed follow a perfect, or approximately perfect, stereo, little matters now, my intention being to direct notice towards a means of interesting the general public in order that the fraternity may derive some definite advantage.

Believing firmly in the prospect of a demand for group photographs such as those indicated, I should like to trespass on your patience a step further and intimate the kind of instrument which I think suited for carrying out the suggestion. The ordinary portrait combination ranging between four and a half and six inches focus will be found as practicable as any. Although it would be inadvisable to use such a lens at full aperture, the employment of a small diaphragm is not only unnecessary but positively objectionable if one desires to secure soft, harmonious, well rounded impressions. Then, again, if complete success is to be attained in this class of work, anything short of a commodious and well lit studio cannot be relied upon. Properties, many and varied, have to be requisitioned, and the means of properly illuminating the same ought to be under perfect control.

With regard to pairs of lenses for securing two images from different points of view at the same time, I must say that I have never met with two instruments absolutely accurate when paired, there is always something wrong about one of them either in focal length or brilliancy of image. This may not be the general experience, however.

With the routine of ordinary manipulation I will not occupy your time, but pass to one other form of slide which can be made exceedingly interesting. That to which I desire to draw attention is the subject of interiors of dwellings, churches, and also exteriors generally, such as street views. Many of these, when illuminated and deeply printed to convey the idea of night, afford much amusement. As most of those present know perfectly well, these effects are produced by colouring the back of the print similar to the method of colouring crystaline. The print is backed up with a suitably coloured ground, and where lights are required, such as candle or gas flames, holes corresponding with the position are punctured with a needle point. Slides of this description are examined by transmitted light like ordinary transparencies.

Sufficient has been brought under notice to raise an opinion on the possibility of progress in the direction indicated, and should these hurried and disjointed sentences fail in their object, to the lack of careful preparation must their failure be ascribed.

Mr. Faulkner did not find in ordinary paired stereoscopic lenses any such difference as affected the identity of the two pictures. It was wonderful how great might be the dissimilarity of the lenses without a difference being discoverable in the unity of the stereoscopic picture.

The Chairman said that there would be no difficulty experienced in getting the work properly executed; the real difficulty lay in getting the public to appreciate and order stereoscopic portraits.

A Member: It should be the province of the photographer to cultivate the public taste and bend it in this direction.

INTENSIFICATION.

By W. B. BOLTON.

I HEARD an amateur remark a short time ago, "I never intensify," and I felt inclined to retort, "Perhaps it would be better if you did;" but as I thought he might recognise the truth of the reply, and I did not wish to hurt his feelings, I refrained. It is all very well and very pleasant, no doubt, to be able to dispense with the operation of intensification, but who, that values his reputation for uniformly good work, will undertake to do without it altogether? It is absolutely necessary at times, even under the best of arrangements, and the most careful working, and he who says, "I never intensify," is either a *perfect* manipulator—which I don't believe—or a careless one who takes little true pride in his work, which is more likely.

But intensification has got into sad repute in connection with gelatine plates, owing to the liability of the intensified image to change, fade, or become denser with time and exposure to light. This applies equally to all forms of intensification, though mercury, in some of its forms, has secured the worst reputation; still, I have little hesitation in expressing the opinion that the instability is not due to the method of intensification, but to the want of care in preparing the film to receive it. I have negatives which were intensified seven and eight years ago, by one of the most distrusted of mercurial methods, that are as good to-day as when newly done; I have others, again, or the remains of them, that exhibit every form of defect that can come from mercurial change.

Silver intensification on the other hand, though the practically universal method employed with collodion plates has gained little favour with gelatino-bromide workers, on account of the liability to stains and discolouration of the film during the operation itself; while it has even been alleged that a gelatine film which has once been touched by a solution containing a soluble silver salt is doomed to discolouration sooner or later.

With regard to the liability to stains, I have frequently endeavoured to show that it is far easier to prepare the gelatine film for silver, than for mercurial intensification, but the difference is that a degree of carelessness that suffices in the case of silver to produce immediate change will be more tardy, though no less sure in its effects when mercury is employed. The change produced in the one case is, in fact, instant and complete; in the other, deferred, gradual and incapable of check. With silver, and only moderate care, the change or stain may be but slight; with mercury, under similar circumstances, the utter ruin of the negative is only a matter of time.

As concerning the alleged after deterioration of silver-intensified negatives, I can only say that I have some that were treated in that manner in the summer of 1880, and which, up to the present time, have exhibited not the faintest sign of any sort of change; and I will say further in connection with them, that if there be any virtue in the oft-vaunted "wet plate character," they possess it in far greater degree than others treated in a different manner, or not intensified at all.

Silver intensification is, and always has been, my favourite, where permanency of result is required (if a negative be only required for temporary purposes, it is not worth the trouble), but recently I have modified my method of using it. Previously I have adhered to the formula frequently given in the JOURNAL and ALMANAC, in which solutions of plain pyro, and of silver acidified with citric and nitric acids, are used; but latterly I prefer to employ a solution of pyro, citric acid, and glycerine, with a separate solution of silver acidified only with nitric acid. The advantages of this method are, that the solutions will keep indefinitely, or practically so, and that the glycerine causes the intensifier to flow readily over the film, enabling the operator to use a very small quantity, pouring on and off the plate, and thus economising silver, as well as saving the trouble of freeing the back of the negative from the dense deposit of silver that occurs when a dish is used.

I make the following stock solutions:—

A.	
Pyrogallic acid	10 grains.
Citric acid	2 "
Glycerine	1 ounce.
Water	1 "
B.	
Nitrate of silver	60 grains.
Nitric acid	30 minims.
Water	1 ounce.

For use dilute one part of A with two parts of water and pour on to the plate, leading it to the edges with the finger or a camel-hair brush, if it refuse to flow alone. One drachm of pyro solution mixed with two drachms of water suffice for a half-plate. When the solution runs smoothly over the whole surface return it to the developing glass, into which half a dozen drops of B have been placed, and again apply the

mixture to the film, keeping it in motion all the time. The density comes rather slowly, and it should be borne in mind that it increases greatly on drying the negative, so that allowance must be made for that.

The only preliminary preparation the negative requires after fixing is a *thorough* washing, but this may be supplemented by a minute or two's soaking in alum and hydrochloric acid as a final precaution. Removal of the hypo by means of eliminators, instead of by washing, is worse than useless; besides which, such substances as the hypochlorites, hydroxyl, or even alum when long applied, destroy the power of intensification. The negative is, therefore, better if simply washed. Should a slight yellow stain appear after prolonged treatment, it is easily removed after the operation is complete by a short re-immersion in the alum and hydrochloric acid, provided it is only *silver* stain and not hypo. The final dip in alum and hydrochloric should always be given in order to destroy any free silver that may remain.

Intensification is more rapid *before* fixing than after; but unfortunately, with gelatine plates, it is most difficult to judge accurately of the density. It may often happen, however, that when a very thin image has to be treated, the application of the intensifier, before fixing, will prove advantageous.

Mr. A. J. Henderson thought that the application of hydrochloric acid and alum would cause a formation of chloride of silver in the film, and they all knew how such chloride would behave under the action of light. A dip into hyposulphite of soda would, he considered, act better. As an intensifier, mercury, followed by cyanide of silver, was believed to be the best. But photographers now preferred to err on the side of over developing, and afterwards reduce the negative, where necessary, by Farmer's method of immersing in a bath of red prussiate of potash and hyposulphite of soda.

Mr. J. M. Turnbull said that there was a form of intensifier recommended by Wratten & Wainwright which bore a great similarity to that just described in Mr. Bolton's paper, with the exception of the addition of glycerine. Intensification had been much resorted to in former times; but now the negatives were usually developed to full intensity at once. Subchloride of mercury, or calomel, when dissolved in iodide of potassium, made a very simple and excellent intensifier.

After some observations by Mr. J. B. B. Wellington,

The Chairman could not speak with approval of the system advocated by Mr. Henderson: in his own hands, at any rate, the action of Mr. Farmer's reducing mixture had a tendency to render the negatives hard by unduly weakening the shadows.

THE PHOTOGRAPHIC USES OF NITRITE OF POTASSIUM.

By H. H. O'FARRELL.

MR. W. A. GREENE recently exhibited at the Camera Club a specimen of a print which he had taken on bromide paper that had been treated with nitrite of potassium. This is the same paper that is issued with the commercial actinometers, and the possibility of using it for printing out has doubtless suggested itself to many, though I have not seen any specimens other than those exhibited by Mr. Greene. I have lately been making some experiments on the use of nitrite of potassium both in the paper and in the developer, and having been called on at very short notice to contribute a paper for the Convention, I think a short description of the results may not be uninteresting to those who are working, or would wish to work, in the same direction, though from the limited time at my disposal, as well as from other causes beyond my control, the experiments are far from complete.

The method I adopted was to make up a ten per cent. solution of nitrite and soak the paper thoroughly, leaving it immersed for ten minutes or a quarter of an hour, and then allow it to dry slowly. The paper thus treated behaved in the ordinary way that the actinometer papers behaved, toning to a greyish blue, which deepened afterwards into indigo. By placing the paper between the leaves of a book and drawing out a portion every five seconds, I found that in strong sunlight the paper attained its maximum density in twenty-five seconds, and that beyond that period no perceptible change occurred.

A portion of the paper, however, which I treated somewhat differently, behaved in a different way. Instead of turning a greyish blue, the paper began with a delicate pink, deepening to a litmus red, and afterwards a brown, before taking on the ordinary blue and indigo tones. Having by me a negative of an individual with brown hair, I conceived the idea of taking a print, with the happy result that by arresting the operation at the stage when the flesh tints had acquired sufficient depth, the hair had toned down to the brown stage, and the coat to indigo.

I conceive some use may perhaps be made of these results not in colour photography but in the more limited area of colour portraiture. A paper which gives flesh tints, browns, and indigo blacks, possesses a sufficient range for the portraying of persons other than the ancient Britons who stained their bodies with woad, or the late Mr. Titmouse, whose hair at one period of his existence assumed a pea-green colour.

At present, however, there is a difficulty to be overcome which is the same that has hitherto proved a stumbling block to all colour photography—the difficulty of fixing the prints by means that will leave intact, and at the same time render stable, the tints obtained. Hyposulphite of soda destroys the colours at once, bringing back the blues to the original pink, and ultimately changing them to a very unpleasant yellowish brown.

Hypo being therefore out of the question, I next thought of sulphite of soda, which has been recommended by Captain Abney as a fixing agent for albumenised prints. To my great satisfaction, I found that the sulphite had no effect upon the colours, and after leaving the prints for about half an hour I concluded they were fixed. So, indeed, they were in the sense that the free bromide had been removed and the image rendered permanent, but the pinks and browns still remained fugitive and ultimately deepened in strong light to a blue tint.

I have not yet tried other fixing agents, but hope to do so shortly. At present, however, I see no prospect of being able to render the pink or brown tints permanent.

Nitrite of potassium used in small quantities in the developer (about twenty to fifty minims to the ounce of a ten per cent. solution) appears to have a considerable accelerating influence. I exhibit specimens of prints which have had the same exposure and were developed with the same developer with and without the addition of nitrite of potassium.

I have also tried the effect of soaking plates in the nitrite solution and exposing in the camera. I obtained on a dull day a faint image of the high lights in five minutes and a badly defined picture with thirty-five minutes' exposure. The image was, however, capable of intensification or development by a *very* weak solution of ferrous oxalate—about one part of iron to twelve of oxalate. The result, however, faded considerably in the fixing bath—hyposulphite—but appeared to be capable after fixing of intensification with the ordinary ferrous oxalate developer.

I am afraid this paper is necessarily imperfect and sketchy, but I shall be glad if it leads more experienced experimenters than myself to investigate the phenomena. Two cautions are necessary in using this very hygroscopic salt with plates—to immerse the plate in alum *before* developing in order to avoid frilling, and to use the nitrite solution fresh.

EXPERIMENTING.

By H. J. GIFFORD.

In looking over the papers of the present day, what strikes me is the vast number of photographers we have experimenting, and how few of them know really how to experiment. They give some of their results, but not all; and even those results are not of any use, owing to some point having been forgotten.

I think it might be useful to some if I pointed out some things which ought to be noted. First, the note-book with the notes of the experiments ought to be kept in such a way that if it was handed to any one else he could perform the experiments over again, and get the same results.

The chemicals used ought to be of the purest obtainable; the maker's name and date of obtaining noted, and if possible tested for impurities, as the results obtained may be due to reactions of the impurities instead of the salt. The distilled water also ought to be carefully tested for iron, &c., which it often contains, the first and last portion passing the still being discarded.

Thermometers ought to be in use constantly, and where gases come into consideration the reading of the barometer also. In boiling solutions the process ought to be described in this way:—Temp. 62°, in twelve minutes, 212°; boiled half an hour, bulk reduced 120 c.c.; cooled to 62° in one and a half hours; barometer at beginning of operation, 30·213; at end, 30·209.

PHOTOGRAPHY FROM ONE POINT OF VIEW.

By EDWARD DUNMORE.

It is usually the case when allusion is made to photography to speak of it in its dual name as an art-science. Now, for the purposes of this paper, we will ignore the science definition, retaining only the art, thus looking on the scientific side of the matter very much in the same way as a painter or engraver looks on his colours and appliances. I am somewhat doubtful if, by thus invariably linking together of art and science in name, we have not produced a bad effect on photography as an art. Whether or no it has had considerable influence in keeping its artistic qualities suppressed I am not prepared to say. At any rate, photographs are, and always have been, looked upon by many as merely mechanical productions, incapable of expressing a thought, suitable only for producing literally just the matter-of-fact subjects that may be presented to the lens. This is, in my opinion, undoubtedly an erroneous idea. That the photographer has, if he be clever in his profession, the power of imbuing his work with his own individuality in a very marked manner, there is not the slightest doubt. Who could fail to see the man in the works of Rejlander, Robinson, Hubbard, Diston, and others? This fact is alone sufficient to prove that a camera and lens, skilfully used, is something more than a mere mechanical copying machine. We see by actual work that picture making by photography is not only possible, but has been actually accomplished. I speak here in the past tense, by reason of having in my mind the pho-

tographs that impressed me most as *pictures*, and which, I have no doubt, many here will associate with the names of the artists I have enumerated. Photography is not easy, by any means, to work as a *picture* making process. The ease with which an image is obtained is illusory, pictures and images not being synonymous or interchangeable terms. It reminds one of learning the German language, which at first sight has many of the words looking so very English that we jump to the conclusion its acquirement is very easy, and not until we have dipped into it we find out our mistake, and that the apparent ease is but delusive. The gay and airy manner with which we thought of mastering it is soon dissipated, instead of which we are involved in a struggle with words that is a formidable and unexpected task to the greater portion of those who make the attempt. It is so very much more easy to blame the process when we fail in our attempt at picture making than to use it. It is no reason because there are undoubted difficulties in the way that we should fall back on that very poor excuse for not making good pictures. Certainly not. It has been satisfactorily proved that pictures in every sense of the term can be made by it, and by patience and perseverance the difficulties must be overcome; the more of them the greater the victory. The well-worn aphorism that "the bad workman blames his tools" is especially applicable to photographers and photography. We know the tools are generally good, and it is our own fault if we do not make good use of them. I sometimes think they may be too good; and when we see such a display of French polish and ornamental brass work, and the very, very small results, it makes one think perhaps if there were less thought for the apparatus and more for the picture it would not be a bad thing.

It is very difficult to satisfactorily define "art," so general is the application of the word in season and out of season. If a tradesman gets particularly ugly patterns in goods they are dubbed "art" productions. The elasticity of the term meets all requirements, from a picture to a funeral. So much, then, for the application of the term "art," upon which I will not further enlarge. Then we get "fine art," even a more debatable term than the other, but not quite so universal in its application. It is, however, decidedly more provocative of wordy conflicts. As to the precise meaning of the term opinions differ; our purpose will be served if we define it as anything beautiful of a more decorative than useful nature, under which head a good artistic photograph may be fairly classed. A photographic picture, then, is an application of the process of photography to represent nature in conformance with the rules that masters in the art of painting and draughtsmanship have laid down as applicable to their particular branches, especially in composition and *chiar-oscuro*. For the present, at any rate, laws relating to the treatment of colour do not particularly concern us, except when colour takes the place of light and shade, and has to be considered in that connection.

Artistic photographic pictures may be classed under three heads: land or seascapes, *genre*, and still life. Photographs may all be fairly included under one or other of these headings. The landscape into which figures are introduced, if the figures should be so composed as to tell some tale by which the interest will be fairly divided between figure and landscape, have given rise to a variety of opinion as under which head such pictures should be classed. A compromise has been made by denominating them as "landscape with figures," a style which Birket Foster's water-colours have so admirably exemplified. In these productions we have action and interest in the arrangement of the figures, yet without destroying that of the landscape, which, by its freshness and suitability, claims almost equal attention. In the composition of pictures of this kind, to which undoubtedly photography lends itself, the *proportionate* size of the figure to the landscape entirely decides the class to which it shall belong if figures are introduced in the foregrounds and treated in an important manner. We should scarcely call that picture a landscape, but if placed in or beyond the middle distance they become subsidiary to the landscape, and the picture may be fairly called a landscape with figures, or the figures may be dropped in the title altogether. There are few, if any, landscapes the interest in which is not increased by the addition of figures. Particular attention should, therefore, be given to their position and arrangement, for awkwardly posed figures in the wrong place will ruin any landscape, however beautiful. The foreground in all landscapes should receive very careful attention, for upon this part of the picture much of the general effect of the work depends, it being close to the eye and upon a larger scale than the rest at once challenges attention. Its arrangement and detail should therefore be most carefully looked to. Many hold, I cannot help thinking, very erroneous ideas as to what constitutes a picture, a "good photograph" being considered synonymous with a "good picture," when, to my idea, they are as far apart as the two poles. However, this is not a suitable opportunity to enter into a long argument as to what constitutes a picture, suffice it to give a few examples of what do not; e.g., a photograph of beautiful clouds, although pleasant to look upon, scarcely constitutes a picture in itself, but add the merest strip of landscape that has pictorial interest and it at once becomes one. A picture must be a combination of several things, each of interest in itself, otherwise it remains a mere photograph; it may be an excellent representation of the object, but without any claims to pictorial honour. This is a rock on which many get stranded, having the idea that a good photograph of any particular object, no matter what it is, is of necessity a good picture. The sooner this idea is exploded the better for everybody.

The more skilful the composition and the better the judgment shown

in lighting, the more a work of art a photograph becomes. In these two directions photographers should especially try to improve themselves. Their appliances may be more difficult to work with than those of the painter to obtain results of an equivalent pictorial value, but difficulty should scarcely be an excuse for indifferent work. I would therefore urge the study of art in its various phases by all who have a desire to produce more than mere photographs; it will not be time thrown away. Can any one suppose any accomplished painter made grand pictures as soon as he knew how to manipulate his colours? and yet many photographers expect to do so directly they have acquired sufficient skill to make a negative. The idea is absurd; years of study and practice and many disappointments must necessarily be experienced before a clever and finished work can be exhibited for public criticism. Why, then, should the photographer be an exception to the rule, and why should one who has really greater difficulties to contend with imagine he can make a *picture* (except by accidents, which in all probability can never be repeated) than a man who by laborious study has learnt, after many failures, to properly handle brushes and colour? The conceit engendered by the ability to make a mere representation of a subject without the most rudimentary knowledge of draughtsmanship encourages the performer to entertain a false estimate of his own skill, a result undoubtedly prejudicial to real progress. True artists will always be in the minority; it is only here and there a man or woman without, perhaps, any decided manipulatory skill will come to the front by reason of their artistic ability. A more slovenly manipulator or more artistic photographer never lived than O. G. Rejlander. No matter how messy and defective his work from a chemical point of view, the *picture* was there; and, had he lived to enjoy the advantages of photographers of the present day, in all probability good manipulation would have been added to his superlative artistic treatment of subjects to which he turned his attention. With the wet plate of his day a man essentially an artist was woefully cramped and handicapped, for to make a complete success you were compelled to think of the plate. When the whole attention should be centred on the subject, this division of interest was a great drawback. Nobody knew it better than Rejlander. Now, however, we can devote our whole attention to the subject, and in the click of a shutter secure any beautiful effect, if we only know how to look for it and to see it when it presents itself. We must see a picture before we can photograph it; if we do not, it is pure accident, and can never in human probability be repeated. This is a reason why a man's skill should not be estimated on the strength of his producing one superlatively good work, for the veriest duffer is sometimes lucky in this respect, and such having received an overwhelming avalanche of commendation is a spoilt photographer for the rest of his days. The ability to see pictures varies with everybody, and to this we owe the great variety of treatment the same subject will receive at the hands of different photographers. Some are artists intuitively, some by education, and some not artists at all, either intuitively or by education, and never will be. Yet all expect to make pictures. We know they cannot, but it is little use saying so. The few go on and succeed, but the ruck never get beyond mediocrity. As soon as any one is satisfied with his work it is all up with progress; his ideal standard of perfection is a very low one, soon reached and never exceeded.

In these days of education and opportunity photographers should be amongst the first to take advantage of our art schools, and not rest in snug contentment, fancying they are independent of anything of the kind because the schools are specially devised for instruction in drawing and painting. The means used may differ, but the aim is picture making, and rules which govern one process will rightly influence another. The knowledge of art is one of the things to which there is no royal road, and it is only by practice, perseverance, and painstaking, that we can hope to see photography raised to that position that it will be no misnomer to call a fine art. Absolute perfection in things mundane is not to be expected, but our endeavour should be to get as near to it as possible. As a proof of how long photographers will be content to run in a groove until started out of it, we have only to go back to the time of Adam Salomon; his exhibits were so excellent and so different from anything English photographers had conceived possible. Like a revelation, it could be scarcely credited that by the aid of the well known silver bath and collodion such rich masses of light and shadow could be produced, but they did. Then there was the pose and composition of the pictures; nobody had conceived portraits arranged with such simple grace and so brilliantly lighted without hardness could be made by photography—but they were. The only difference was the process was directed by a master's hand, that was all. From the time his pictures were exhibited English photographers began to see the tools they worked with were capable of much more than they had suspected, and a vast improvement in portraiture and artistic management of the picture immediately took place.

With landscape work there is no such thorough revolution likely to take place, for as good pictures were taken years ago as now of the subjects to which photographers were then restricted. The most charming effects of light and shade were reluctantly passed; the prompt exposure at the right moment was well nigh impossible, for by the time the wet plate was ready the effect was gone. Photographers were in consequence limited to evenly lighted views. The uniformity accruing from this cause

gave rise to the depreciating term "photographic" when applied to other pictures. Now, however, the rapid dry plates have placed the long wanted power of being ready at a moment's notice in the photographer's hands, and any effect, no matter how transient, may be secured. The abuse of such power by exposing on anything that comes must be avoided, and there is no doubt that when the novelty wears off it will be. We now have a grand chance of making real pictures, such that we scarcely did more than dream of formerly; we have, therefore, a right to expect a corresponding improvement in our work.

Mr. J. J. Briginshaw then read the following statement, which he had received on behalf of the Photographers' Benevolent Association, copies of which were distributed among the members of the Convention:—

"We, the undersigned, have been deputed by the Committee of the Photographers' Benevolent Association to bring under the notice of the Photographic Convention of the United Kingdom, at their meeting at Glasgow, a statement setting forth certain claims the Institution has upon the fraternity.

"The Benevolent Fund was inaugurated in 1873 with the sole object of helping indigent and infirm members of the craft who were found to be deserving of substantial sympathy, such cases as those arising from sickness, death, or prolonged lack of employment, being considered to be eligible. From the commencement of the Society's labours up to the present *bona-fide* applicants whose contributions entitled them to benefit have been as liberally dealt with as the funds at the disposal of the Committee for the time being justified, or was deemed adequate. The Society has thereby greatly lightened the tax imposed on individuals who might otherwise have been called upon to dispense private benevolence under circumstances sometimes the reverse of agreeable.

"Much remains to be done in order to carry out the intentions of the promoters, especially in the direction of the education of orphans and giving annual pensions to the aged. For these special objects, as well as assisting in the general scheme, the Committee appeal, through the members of the Convention, to all interested in photography, whether actively engaged therein or not, to aid them in their endeavour to build up an institution worthy of the present status of our profession. The first step towards attaining this much-desired end is to strengthen the hands of those already engaged in the work by each and all entering heartily into the spirit of doing good unto others. An annual subscription of 2s. 6d. constitutes membership, and this sum is so insignificant that no one could with any semblance of truth be found to say that such contribution was beyond his means. In case there be any misconception, it may be at once stated that the funds have not accumulated to their present state with such small payments, but from the generous donations cheerfully given by amateurs and the more wealthy members of the profession.

"Donors of one guinea per annum are entitled to the privilege of recommending deserving cases of non-members for the consideration of the Committee in addition to possessing equal rights in controlling the management of the Society with ordinary members. The Association is registered under the Friendly Societies' Acts, and it may further be stated that a thoroughly representative Committee of twelve members of the Association, jointly with the following gentlemen, guide the fortunes of the Institution.

"President: J. Traill Taylor.—Trustees: Capt. W. de W. Abney and Walter S. Bird.—Treasurer: John Stuart, 112, New Bond-street, W.—Central Secretary: H. Harland, 83, Hawksley-road, Stoke Newington, N.—Committee Rooms: 181, Aldersgate-street, London, E.C.—
"Signed on behalf of the Committee—W. M. ASHMAN. EDOAR CLIFTON."

Mr. Taylor, by whom the papers of the absent members had been read, announced that at the Wednesday evening meeting the chair would be taken by Professor A. S. Herschel, and that after the reading of several papers, a second lantern entertainment would be given, during which would be shown a choice collection of selenite and other slides by polarised light, Mr. Briginshaw officiating as demonstrator.

On Wednesday morning a numerous party went on an excursion to Loch Lomond and Loch Long, under charge of Mr. John Stuart, and an equally numerous contingent went by special steamer, under charge of Mr. George Mason, to witness the yacht regatta at Largs.

The Exhibition Department of the Convention is singularly fine; but we must defer all notice of it till next week.

CONVENTION JOTTINGS.—I.

(By our Special Correspondent.)

We started from London by the Midland for Glasgow on Friday night, July 1. The Convention meetings beginning on Monday morning following, we wanted to have a look round on the Saturday

and make a note of the preparations previous to the bustle which we expected in the beginning of the week.

An item in a select party, we got comfortably laid out in a compartment, and arranged ourselves so as to obtain the greatest amount of comfort out of limited space, and we packed pretty well. It was too hot for anything but lounging; even when a good joke was perpetrated it was an effort to laugh, and we really had to think a laugh, if you could conceive such a thing. We all, as usual, did a sleep now and then, and each starting up in turn would assert that he had not slept at all, and for a minute or two would look round—so very wide awake—then the eyelids would gently drop and the nose would make an audible indication that the protestor was away again. At a very early hour in the morning B—exclaimed, "Oh, look at the beautiful fireworks!" (he had been evidently dreaming about the Jubilee), but he was mistaken, it was nothing so short-lived or expensive—'twas but the rising of the sun, and he sat and gazed at it, highly delighted. "The beautiful in nature goes on all the time," he said, evidently thinking of writing a poem. "The slumbering world moves along unconsciously, and the glorious pictures in the heavens unroll themselves one by one, passing by unheeded, uncared for."

"Yes, B—, and if you hadn't been on the night shift, you would have been one of the slumbering world too," said P—, as he rolled himself over on his seat. He was not in a mood for aightseeing.

I remembered once on this journey when crossing at Settle having a beautiful panorama of hill and dale, so charming that it has lived with me ever since, and eagerly I waited for this. But nature was not in the mood, or I was too sleepy; the outline of the hills were veiled, or my eyes would not keep open. There was something wrong somewhere, and I gave it up, drooping off into unconsciousness.

As we reached the commercial capital of Scotland, we found a gentle rain falling that was very refreshing—a mist, I think, it is termed in these northern latitudes. As they have been baked hard with the continued intense heat here as much as we have been in the south, this moisture was welcomed all round. We arrived at the "Waverley Hotel," and freshening ourselves up outwardly and inwardly, we prepared for a day's enjoyment. We began the day's proceedings by visiting the Institute of the Fine Arts, where the meetings, and exhibitions, and lecture entertainments are to be held, and Glasgow deserves great credit for the very handsome way that everything for the convenience and comfort of intending visitors to the city has been arranged and fitted up. In fact, it is in its method of arrangement a "British Association" on a small scale.

In the one building there are ladies' and gentlemen's rooms, writing rooms, smoking room, secretary's room, exhibition and entertainment rooms, and all done up with great taste, combined with attention to the perfect comfort of the visitors.

The exhibition of pictures alone would be worth coming a long way to see, and Mr. Robert Turnbull, who is the chairman of the exhibition committee, deserves both thanks and praise from the Convention for the very able manner that he has performed his part of a very arduous task, for when we visited the rooms on Saturday everything was done, and well done; and when it is said that all this work under his management was begun and completed within two days, the visitor has but to look round and see the "something attempted, something done" to earn the meed of praise.

After inspecting the rooms, and shaking hands with a few old friends, we started out to see the city from the top of a car (this is the proper way to see a city), under the conductorship of Mr. George Mason, who took us over about fifteen or twenty miles of streets—north, south, east, and west. We viewed the palaces of the merchant princes, and looked into the hovels of the lapsed masses. We inspected the beautiful parks, and the Greens where the toilers have a chance of breathing the fresh air in their leisure moments. And last, though not least, we came upon that venerable edifice, Glasgow Cathedral, where the story of the genius of our forefathers is told in silent stone, on which we but look to read that there were giants in the land in those early days. The stained-glass windows in this edifice are supposed, for number and beauty, to be almost unrivalled in any one building. These windows are modern, and in many cases are the gifts of wealthy donors. Behind the Cathedral is the Necropolis, charmingly situated on a hill which rises ridge on ridge. As we stood looking at it, "We must have a picture of that!" was the

exclamation of all. We got home to our hotel, and after a good dinner got into the smoke room, and where a few of us are met together we indulged in matters photographic, of which more anon.

Sunday was a very quiet day in Glasgow, and there were no chances of getting outside of the city, both the steamboat and railway traffic being entirely suspended. Several members somehow contrived to arrive in the morning, and when "Joe," of the "Waverley," announced that dinner was on the table, no fewer than thirty-two ladies and gentlemen were found ranged around the well-spread board, presided over by the Chairman of the Convention's Council, and supported right and left by the Secretary and other brethren.

Of the genial gossip which took place over the fraternisation in the smoking room nothing need here be said, as it is easy enough to conceive of it.

On Monday the yacht-shooting mania seemed to be strong on some of us, and a party headed by Hyslop and Pringle went down the Clyde, bent on capturing the graceful "white-wings;" while Keene (father and son), Jerome Harrison, and a party whose predilections were archaeological, paid their devoirs to the Cathedral, leaving Wellington, Smith, and a considerable party—who, having come north *via* steamer, had arrived in the best of spirits that morning—to ply detective cameras in the busy thoroughfares and along the Broomielaw.

CONTINENTAL PHOTOGRAPHY.

[Translations and Abridgments.]

THE FLORENCE PHOTOGRAPHIC EXHIBITION.

At the present Photographic Exhibition in Florence, the jurors, who have all been elected by the exhibitors, are Professor Luigi Borlinetto, Giuseppe Alinari, Anselmo Anglinelli, M. Nadar, Professor Cesare Zocchi, the Chevalier Emilio Trèves, the Chevalier Ulisse Granchi, the Marquis G. Gozzoni, the Chevalier F. Alman, Count Lodovico de Courten, Professor M. Gordigiani, Captain Pizzighelli, Professor Léon Vidal, Carlo Brogi, A. Corsi (engineer), Professor P. Stefaulli, Giovanni Berti, and Professor F. Andreotti. The first meeting of the jurors was on the 10th of this month, and M. Léon Vidal left Paris to be present thereat to perform his duties, and to gather materials for publishing in France a full description of the Exhibition.—*Le Moniteur de la Photographie*.

PINHOLE CAMERAS.

At present efforts are being made in France to developé pinhole cameras so as to yield the highest results they will give. Messrs. Dehors & Deslandres have invented a camera furnished with a variety of pinholes of accurately measured dimensions, and constructed for taking both ordinary and stereoscopic views. By means of a rotating disc, any particular pinhole can be brought into play. With pinhole cameras the widest possible angle is included, the images are entirely free from distortion, and are always in focus, whatever the distance of the ground-glass from the pinhole.—*Journal de l'Industrie Photographique*.

PHOTOGRAPHY IN PICARDY.

A few months ago but a single photographic journal in France, that of Versailles, was printed by lithography; a second has entered the field, namely, the *Bulletin* of the Photographic Society of the North of France, published at Douai. It bears the signatures of the President, Monsieur G. Mangir, and of the Secretary, the Abbé Vandy.

At a meeting of this Society, held on the 18th March, Lieutenant Sirvin exhibited a panoramic camera of his invention for taking photographs upon paper. At its meeting on the 22nd April, M. Groult exhibited a stereoscopic camera with a magazine of plates, which could be brought into position as required for exposure. He also exhibited specimens of good work done with the instrument.

This Society has written a very important letter to the President of the *Commission d'Organisation* for the *arrondissement* of Douai requesting the organization of an International Congress of Photographers on the occasion of the International Exhibition in Paris in 1889.

The lithographed journal of the Photographic Society of the North of France contains also an illustration executed by photographic means. Its second number contains a representation of the ancient gateway of the Chateau of Ferté-Milon, reproduced by M. Berthand, of Paris, by phototypy. The negative was taken by M. Edmond Bayard.

The writing in this lithographed journal is too small; it is trying to the eyes of readers, but very well executed.

THE "BULLETIN BELGE."

The *Bulletin de l'Association Belge de Photographie*, published at 37, Rue Souveraine, Brussels, has always been a journal of first-rate quality, but this year additional improvements have been introduced, until as a monthly photographic journal it is without a rival. Its May number contains a frontispiece by the Woodburytype process, executed by Braun & Co., of Dornach. It consists of a copy of the picture which carried off the gold medal at the Belgian Photographic Exhibition, representing the interior of a blacksmith's shop; the original photograph was the work of M. Georges Wilmotte. The official report of the General Secretary says that the reputation of the *Bulletin* is increasing in foreign countries, and that its circulation abroad is increasing likewise.

ORTHOCHROMATIC PHOTOGRAPHY IN BELGIUM.

At a recent meeting of the Brussels Section of the Belgian Photographic Association, M. Gêruset gave the results of his experiments with orthochromatic plates, and said that the best had been obtained by him upon those made by Mr. Edwards, of London; the plates were also quite as rapid as the ordinary ones he had in daily use. He thought orthochromatic plates to be a great advance in photography, that they gave more truthful results than other plates, and diminished the work of the retoucher. M. de Blochouse was of the same opinion. M. Rutot raised the question whether a deep blue would not be the best light in which to developé orthochromatic plates, since that colour seemed to have little effect upon them. The President, Signor O. Campo, called attention to a brown kind of paper, now coming into use in Germany, said to permit the passage of a good light for developing, and one not fatiguing to the eye.

THE DEATH OF AUGUSTE FLORENVILLE.

The report of the Secretary-General of the Association Belge announces the death of Auguste Florenville, who assisted at the birth of photography, and who passed away recently at Liège after a short illness. Florenville, after reading about the discoveries of Daguerre in the annals of the Academy of Sciences at Paris, immediately went in search of the inventor, and they tried various experiments together, the results of which were recently publicly exhibited. With apparatus furnished by Daguerre, Florenville returned to Liège, and carried on experiments in photography with the Baron de Wittert. One of their first satisfactory results was a portrait now in the possession of M. Laoreux, with the following words upon it:—"September 1839—*Pose seven minutes at two o'clock in the afternoon.*" Florenville never ceased to study photography in his leisure hours, and among those who learnt under him was the present President-in-Chief of the Belgian Photographic Association, Dr. Candèze. For a great many years Florenville was a member of the Council of the Association.

The same report has a notice of the death of Léonce Rommelaere, the founder of the Belgian Photographic Association, and the Director of the Industrial School at Brussels, whose lamented decease has already been published in these pages.

MISCELLANEOUS ITEMS.

An "Excursion Society of Photographic Amateurs" has been started in Paris, under the presidency of M. Gaston Tissandier, director of *La Nature*.

It is proposed to found a new society, under the name of "The Parisian Photographic Association," and the proposal seems to be creating a little friction.

The London correspondent of *Le Moniteur* says that when he read in the *Times* that Mr. Mayall had discovered a method of producing photographs in natural colours, it gave him a little electric shock.

The *Journal de l'Industrie Photographique*, says that in America some journals have furnished their reporters with detective cameras, with which they take instantaneous views of events of interest, and send off transparent proofs to the editors. Each proof is then placed in a lantern, the image is projected upon a paper screen, upon which a draughtsman at once begins to work with ink and brush. The result is reduced by photography, engraved or otherwise, made into a printing block, and then is worked off upon the machine with the text of the journal.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 9159.—"Improved Process for Producing Grained Relief and Intaglio Clichés from Photographs." J. BARTOS and H. KÜHN.—*Dated June 28, 1887.*

No. 9220.—"An Improved Adjustable Stand for Holding Glasses to Exhibit Photographs, Cards of every Description, and all Articles of like Nature." J. A. RICHARDS.—*Dated June 29, 1887.*

- No. 9304.—"An Efficient Photographic Instantaneous Shutter." W. E. KERSLAKE.—*Dated June 30, 1887.*
 No. 9341.—"Improvements in Combined Changing Boxes and Dark Slides for Photographic Purposes, and in Portable Dark Chambers for use therewith." A. PUMPHREY.—*Dated July 1, 1887.*
 No. 9347.—"An Improved Lens." J. WALSH.—*Dated July 1, 1887.*
 No. 9402.—"A Combined Folding Metal Washing, Draining, and Drying Rack for Photographic Use." W. TYLAR.—*Dated July 2, 1887.*

PATENTS LAPSED.

- No. 1216.—"Microscopic Photographs." Communicated by Molera and another. W. R. LAKE.—*Dated 1880.*
 No. 1217.—"Facilitating the Reading of Microscopic Photographs." Communicated by Molera and another. W. R. LAKE.—*Dated 1880.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
July 12	Manchester Amateur	Masonic Hall, Cooper-st., Manchstr.
" 12	Derby	Sykes's Restaurant, 33, Victoria-st.
" 12	Bolton Club	The Studio, Chancery-lane, Bolton.
" 13	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 14	Birkenhead	Free Public Library, Hamilton-st.
" 14	Bradford Amateur	Grammar School.
" 14	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.
 On Thursday night, June 30, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. A. Mackie presided.

The Annual General Meeting of the Association was adjourned for a month. Mr. W. M. ASHMAN suggested that the occasional markings round the edges of gelatine plates might be discussed.

Mr. J. J. BRIGGS said that they were usually ascribed to the action of sulphurous matters in the atmosphere.

Mr. W. E. DEBENHAM believed that to be the true explanation, and that the only remedy was to enclose the plates in hermetically sealed packages.

The CHAIRMAN stated that the markings could sometimes be abolished altogether by soaking the plate in the ammonia and bromide before applying the pyrogallol.

Mr. DEBENHAM added that they could often be removed altogether after the final washing of the negative by then rubbing them with the finger under running water.

The HON. SECRETARY asked how it is possible to tell when paper negatives are fixed.

Mr. R. L. KIDD responded that the unfixed portions are more opaque than the others.

The HON. SECRETARY said that the strength of his fixing bath was four ounces of hypo to the pint of water.

Mr. KIDD replied that that was not strong enough for plates; it would do for albumenised prints.

Mr. A. COWAN had never found a half-saturated solution too strong for plates.

Mr. KIDD remarked that when a plate is previously full of moisture it will often be long in fixing, and it may then be advisable to give an intermediate treatment with alum to contract the film; it will then fix readily.

Mr. DEBENHAM had found that there was an enormous difference in the time of fixing of different brands of commercial plates.

Mr. KIDD stated that the fixing solution should be six or eight ounces of hypo to the pint of water. As a rule, the more sensitive the plate, the longer it is in fixing. The best way to render paper negatives transparent was to smear vaseline over them, and then leave them in a warm place for twelve hours. The best way to store them was to put a batch of them between two plates of glass. The vaseline does not penetrate the gelatine film on the face of the paper, so does not come off upon the print.

Mr. ASHMAN asked whether any one knew anything about the Wale lens, which Mr. H. P. Robinson described in the *Photographic Times* of New York as about the best.

Mr. W. H. PNESTWICH thought that it was made in Paris and sold in America.

Mr. DEBENHAM wondered whether it were like some of the Steinheil lenses made in Paris, and sold in England by some of the smaller professed makers.

Mr. KIDD spoke of the advantage of using lenses of long focus for instantaneous views of yachts under sail.

Mr. F. W. COX asked how it was that when a plate was forced in development there was a tendency to develop markings of the paper in which the plate had been packed.

Mr. T. BOLAS said that if an ordinary exposure were given upon a subject with no specially strong high lights in it, and the same plate were afterwards exposed upon another view and with ten times the ordinary exposure, probably not a trace of the first picture would appear on development.

Mr. ASHMAN said that the public are now frequently postponing having their likenesses taken, and are waiting the advent of photographs in natural colours in consequence of what they have read in the daily newspapers.

Some general conversation then took place about the morality of statements made in some of the advertisements in photographic newspapers, in which various persons stated their goods for sale to be superior to all other goods of the same kind.

The meeting then broke up.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this Association was held on Thursday, the 30th ultimo, at the Royal Institution.—The President, Mr. George H. Rutter, in the chair.

The minutes of the preceding meeting were read and confirmed.

Mr. Vero Driffield was unanimously elected a member of the Association.

The SECRETARY distributed the circulars of the Exhibition of the Royal Photographic Society of Ireland; he also read a letter from the Secretary of the Royal Meteorological Society, asking for photographs of lightning flashes, and calling the attention of amateur photographers generally to the subject.

Mr. R. CROWE remarked that he believed he had taken the first negative in existence of a lightning flash, and would be pleased to let the Meteorological Society see it. He recommended, from his experience, not a rapid rectilinear with full aperture, as advised by the Secretary of the Meteorological Society, but a single lens with aperture not exceeding f_{16} , on the ground that the lightning flash is quite actinic enough to impress itself with the smaller aperture, whereas with the large aperture the plate would be generally fogged by the amount of diffused light present whilst waiting for flashes to occur.

Mr. RUTTER exhibited, on behalf of Messrs. Lange and Mayne, some fine prints in platinum, also three prints, for comparison, of same negative, one platinum and two Obernetter's paper, one of which had been squeegeed on glass, the other on ground-glass, so as to compare the effects of enamelled and matt surface. Mr. Rutter also exhibited and explained a Gotz half-plate camera and Morgan & Kidd's roller slide with Rogers's indicator and attachment for employing Eastman rolls. These were examined with considerable interest.

Dr. Kenyon exhibited a number of very fine 12×10 enlargements on Eastman gelatino-bromide paper from quarter-plates and Eastman stripping films, some of which were taken on the Rossett excursion.

Mr. W. A. WATTS read a paper entitled *Notes of a Visit to the Autotype Works.*

Some discussion arose about the difficulty of estimating exposure in carbon printing, some members thinking the reader of the paper had not attached sufficient importance to the difficulty.

Mr. W. H. KIRKBY remarked that with a little practice the difficulty disappeared altogether.

Mr. RUTTER read report of the Bowdley excursion, for which so few gave in their names that it was changed at the last moment to Shrewsbury and Church Stretton. Eight members went, but the weather was unfavourable.

Dr. KENYON read report of the Rossett excursion, from which it appeared that eight members took part and that seventy plates were exposed.

Dr. Kenyon and Mr. B. J. Sayce exhibited some results.

Mr. A. W. BEER reported on the Bolton Old Halls excursion, visiting Turton Tower, the Hall in the Woods, and Smithells. Five members were present, the day being lovely, and from fifty to sixty negatives were obtained.

Mr. RUTTER reported that the Broxton and Carden Halls excursion took place on June 25 in charming weather, five members and two friends taking part in the excursion. The party were met in a most hearty manner at Carden Hall by Mr. and Mrs. Leche. Carden Hall is a very fine old magpie hall with a large amount of carving on the front. Upon inquiry, it was found at the end of the day that fifty-nine exposures had been made, both plates and paper being used, the former being Ilford, Ronch's, Thomas's, Edwards's, and Derwent, whilst the paper was Eastman's ordinary and stripping films.

It was announced that, owing to circumstances, the excursion arranged for July 16 to Irby and Thurston had been given up, and there would be substituted for it one to Speke Hall, leaving Lime-street at fifty minutes past one, those wishing to take part to communicate with Mr. C. P. Houghton, 18, Seel-street.

The adjourned discussion on *Paper versus Glass* was then opened by Mr. B. J. SAYCE, who claimed for paper films the advantage on several grounds. He said he had worked on glass many years, but had recently adopted paper, and was quite satisfied with the results, in proof of which he showed a number of prints from negatives both on glass and paper, in many cases of the same subject, and in no case was there any inferiority on the side of paper, whilst in some it was distinctly superior. He claimed for paper the advantage—1st, In weight. 2nd, Facility for changing and therefore for securing a considerable number of negatives in an excursion—the only difficulty was the number of routine operations to be performed, but that could be overcome by systematic arrangement—he employed himself a notebook containing space for initials when wound off. 3rd, Development—he found great latitude, more so than glass; there was some liability to spots, which were quite avoided by the use of plenty of water before development. 4th, Rapidity greater than glass. 5th, Freedom from halation, in illustration of which he showed two prints, one from paper and the other from glass, of the interior of Gresford Church, in which the paper negative was quite free from halation.

Mr. CROWE, on the side of glass, stated that he admitted for paper the one great merit of portability, but with regard to freedom from halation he did not think the film or nature of the material had anything to do with it; the cause of halation was over exposure, in support of which view he showed several negatives on glass of subjects likely to produce halation, but which were quite free from that fault, one in particular of a glass roof with iron supports. He also maintained that the same amount of minute detail could not be obtained on paper as on glass, and showed several negatives containing a large amount of minute detail, which he did not believe could be matched on paper.

Dr. KENYON attributed the freedom from halation shown by paper to the rapidity of development by which it was characterised.

Mr. LEWIS complained of the want of flatness in the Eastman carriers.

Mr. KIRKBY was in favour of paper; he found it more rapid than glass. He advanced the theory that the reason paper is quicker than glass is because in the latter the particles of the emulsion are in a state of strain, whereas in paper it is not so.

Prints and work were exhibited by Dr. Kenyon and Messrs. Sayce, Tomkinson, Ryley, Crowe, Lange, and Mayne, and, after an interesting discussion, the meeting closed at a late hour.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

PRESIDENT DEXTER H. WALKER in the chair.

The following questions were asked by Mr. ROOSEVELT:—1st. Is not the time of exposure by far the greatest difficulty in the mechanical part of photography, and can any assistance be given the amateur in determining what it ought to be? 2nd. How do under exposure and over exposure respectively show themselves in the process of development and in the negative when developed? 3rd. After developing a plate with a potash developer as far as it will go can it not be then further developed with a fresh soda or ammonia developer, or *vice versa*?

Mr. SPAULDING, to whom these queries had been submitted, read as follows:—1st. Correct timing of exposures is certainly a difficult matter. In view of the many variable elements that enter into the calculation there is in the nature of the case no help for the photographer except in experience and close observation. The difficulty is, however, less in proportion to the amateur's skill in developing. 2nd. If the developer be freshly made, and of the same temperature, the very short time elapsing before the appearance of the image indicates over exposure. This test, however, I have never found to be of any practical value. We may better judge by the colour, that is, degrees of intensity of the high lights when they first appear. If the high lights have only a very pale black before the rest of the image appears, the plate is over exposed, and needs immediately bromide and more pyro. In other words, we can judge by the rate of development, provided the developer be uniformly fresh and the temperature the same. 3rd. As seen in the reaction, $C_6H_6O_3 + H_2O = C_6H_6O_4 + H_2$ and $2 Ag Br_2 + H_2 = 2 H Br_2 + Ag_2$, the oxidation of the pyro is attended by a constant production of hydrobromic acid, and any acid retards the further oxidation of the pyro, and should therefore be neutralised by some alkali. One alkali will neutralise the acid as well as another. After potash, for instance, has done its work, it would be useless to add soda or ammonia, since there is no more acid for them to neutralise. The above reactions are written separately, but are in reality simultaneous. The pyro will cease to take up oxygen and liberate hydrogen when the hydrogen can get no more bromine; that is, when all the bromine that has been loosened, so to speak, by the sunlight has been exhausted. If more alkali be then added it will only soften the film and fog the plate. I should add that in the development of our dry plates hydriodic acid as well as hydrobromic acid is produced. All this is, of course, *a priori*. I have not experimented in that direction.

The CHAIRMAN said: This meeting is called to deal more especially with general discussion relating to plates and their development, and of course we want to hear from everybody in the room all they have to say on the subject. In order to start the discussion, I will read a paper, which may be of some interest to you, which was written by Lieutenant C. L. Bruns, of the United States Navy, who is now present, and who requested me to read it. The paper is entitled, *A Paper on the Proper Time for the Exposure of Dry Plates*, and afterwards I propose to read a paper, hurriedly written by myself, relative to experiments made in the same direction. I hope you will not consider it egotism on my part to read what I have written, nor is the method of timing suggested altogether new, but I assure you it was written with the intention of calling out argument, in which all are invited to participate freely. It is a question of the most vital importance to us all.

Can a close approximation of the time of proper exposures be determined scientifically? The object of this paper is to give briefly a history of some personal experience in this direction. I would premise that the practice of photography is based entirely on variables, which is particularly unfortunate with the amateur, whose work is only occasional and with subjects constantly changing. He therefore learns nothing definitely by his previous work; his experience is of but little service to him, as he is constantly confronted with variables. To reduce the variables has prompted me to experiment upon the actinic effect of light. I have tried several plans, and finally adopted a very crude sensitometer, which, however, has served me very well. The sensitometer referred to is albumen paper freshly prepared for each day's work. This involves but little trouble or time. A strip cut from a sheet of albumen paper, say one inch by six, put in a jar containing the sensitising solution (nitrate of silver of some fixed strength) for an indefinite time, is drained and dried, and not to be feared. Place the sensitised slip of paper between two flat pieces of wood bound together with rubber bands; pull the paper out to protrude, say, one-half inch. Expose this to the sun until it has blackened all it will, and call it actinised. Now pull out one-half inch more, expose it to the sun, and note the time. I find it convenient to stand back to the sun, or facing north, and place the paper on the ground at a distance of four feet from the point where I stand, and maintain this as a constant, and then wait until the newly exposed paper reaches the colour of the first, or is actinised, noting this time, which interval I will say is one minute. Suppose, now, I desire to take a copy of a picture in my room. I have here an ordinary plate holder so arranged that any portion of the sensitive plate may be shielded, while the rest may be exposed. In the dark room I shield all but the lower fourth part of the plate, I then expose it in the camera, say ten seconds, and take the plate to dark room, raise the shield, exposing this time two-fourths, or one-half of the plate. Returning to the camera, I expose ten seconds, thus giving twenty seconds to the first fourth, ten seconds to the second fourth, proceed the same with the third fourth, exposing ten seconds, then the fourth fourth, or the whole plate, exposing a few minutes with cap on, or it need not be exposed in camera at all. In the former, on developing, if the camera leaks it will show on the fourth fourth; in the latter, the dark room lets in actinic light. Now the first fourth being exposed three times, each of ten seconds, or thirty seconds, second fourth twenty seconds, the third fourth ten seconds, the plate being developed will show which section was most favourably exposed. Assume this section to be the second fourth, or twenty seconds. We now arrive at the conclusion that when a piece of sensitive paper takes one minute to actinise, then say (Mr. R.'s) plate, registering sensitometer sixteen, requires twenty seconds for a proper exposure. On some subsequent occasion I desire to make a copy of a similar subject. Expose a paper the time to actinise is two minutes. I know that with (R.'s) plate, registering sensitometer sixteen, when the paper actinises in one minute it should be exposed twenty seconds, and from the following proportion the proper exposure of the plate of subsequent day is determined, namely: one minute to actinise is to two minutes to actinise, as twenty seconds (the trial exposure) is to the proper exposure, or forty seconds, which is the time to properly expose on the subsequent day. Therefore all that is necessary on the subsequent day is to focus and expose forty seconds, and we have a properly exposed plate. For outside work, using slow plates, follow the same procedure, but expose three plates. For economy use small plates. Make exposures of sensitive paper before and after the plates were exposed, to be certain the conditions did not change. Obtain the time to actinise the paper, and the time of the best of these plates. This gives a positive condition for that plate, and that character of subject. On a future occasion, by exposing a sensitive paper, the actinic condition of the light and the time of exposure is obtained by the law of direct proportion,

That is, the time of exposure of sensitive paper to a certain actinic effect on the trial plate is to the time of a subsequent exposure of paper to an actinic effect, as the time of proper exposure given by the trial plate is to four, or the proper time to expose the plate on a subsequent occasion, the character of subject being considered similar. The character of subject may be determined to suit the individual taste; for instance, a marine view, clouds, foliage, bright sunlight scene, or scene entirely in shade. If trial exposures are made for each, and carefully noted, there should be no difficulty, by reference, to obtain the time of correct exposures. For rapid work I place great reliance on the proper selection of the shutter spring. Its action should be uniform. It does not matter so much how fast it is, but that its tension should be constant. Fix the spring permanently. A rubber band is bad; it is deceptive, and subject to wide changes and irregularities. Graduate the time by the diaphragm, and not by varying the tension of the spring. In the trial exposures use, say, one-eighth, one-fourth, one-half inch stops. The areas of these are to each other as the squares of their respective diameters, and are respectively one-sixty-fourth, one-sixteenth, and one-fourth of an inch. The amount of light that passes through stops is directly proportional to their areas, hence the one-eighth-inch stop is four times faster than the one-fourth-inch, and sixteen times faster than the one-half-inch stop. Now, proceed with the plates. INTACTIONS.—Expose the sensitive paper in the room on the wall directly in front of the lens. Make a trial exposure as explained under copying. Let the exposures be, say, half-hour apart, or what the experimenter may conclude as best. Note the time it takes the sensitive paper to actinise, and the time of the exposure as given by the trial plate, and then by the rule suggested you can obtain the time for proper exposures in any other interior. In conclusion, I would recommend you to make a copy on the shielded system as applied in this plate holder, and you will be more than pleased to note the effect of the developer and the results. You will also see how much longer the zone of proper exposure is than you believed. You can tell what the actinic difference is, whether your windows are open or shut in the studio, and the range of time of any particular plate by which a proper picture may be secured.

Since Lieutenant Bruns's paper was written I have been experimenting further, and I have formulated the following as the result:—

To reach the maximum exposure any plate will stand has been one of the difficulties in the way of all photographers. When you have put your plate in the holder, the first question presenting itself is, "What stop shall I use?" Next, "How long an exposure shall I give this plate?" If you are in doubt you ask your learned and experienced friend near by, and he puts his finger alongside his nose, looks wise, examines the sky as if he were in search of a comet, and then coolly suggests: "Well I guess" (and it is all guess) "I'd give her, say, ten seconds." Now your own idea had been two minutes' exposure. If you ask four different persons, all of equal skill, they will "guess" at a variance of from fifty to one hundred per cent. Now how ridiculous this appears to be, and is. Here is a science based upon exact chemical laws, and yet we are constantly guessing. How to overcome that part of the guessing which relates to the exposure of a given plate has been the subject of inquiry and experiment by Lieutenant Bruns and myself, with the object of presenting the results for your information and discussion. Experiments made yesterday by us demonstrated that to actinise sensitised paper required one hundred and seven seconds. A Carbutt B plate (sixteen sensitometer) exposed in parts for two, four, and six seconds, on development gave best results and clear detail on that portion which was exposed for four seconds. Thus we had the two constants or non-variables for that kind of plate, they being one hundred and seven for the paper, and four for the plate. Now these results are to be utilised as the basis of all calculations for exposure of such plates, and the process of arriving at the correct time for exposure on some other day, when the light may be different, will be as follows:—Say next week, on a dull day, I wish to make a correct exposure of a similar plate. To do this I first expose a piece of the same sensitised paper as explained. Say it takes five minutes to thoroughly actinise it, which is equal to three hundred seconds. Now I have learned that this day it required three hundred seconds to do what on another day requires only one hundred and seven seconds. I therefore make the figures to ascertain the required exposure to be given, to wit, as one hundred and seven is to four (these being the constants) so is three hundred to the required exposure, and the answer is thirteen seconds. So that yesterday I would give four seconds' exposure, and next day, as per example, thirteen seconds. With such experience as we have had, we feel satisfied this method is approximately correct. And I am certain, as experiment has proved, that the larger the constants the greater is the margin for correct exposure of the plate when taking a picture. That is, if the constants are ten times greater than those given, say one thousand and seventy seconds and forty seconds, the chances of correct exposure are increased in that ratio. An experiment made to-day with a new lens and camera showed that it only required ninety seconds to actinise the sensitised paper, and that a Carbutt B plate exposed seven seconds with the smallest stop (being only three-thirty-seconds of an inch in diameter) gave the best negative. The two figures being used as new constants, a further experiment was made by exposing the sensitised paper in the shadow of our working room. After exposure of eighteen minutes and forty-two seconds, the paper showed partial actinisation. As time was pressing (at four o'clock p.m.), a piece of paper was taken into the sunlight and was allowed to actinise up to an apparent similar extent, which required twenty seconds. At the same time a fresh piece of paper required two minutes in sunlight to become fully actinised. It will therefore be noted that the piece of paper exposed in the room, which had been partially actinised, if taken into the sunlight would have reached actinisation in two minutes, or one hundred and twenty seconds. And as it required two minutes to fully actinise, it had been exposed to within sixteen and two-thirds per cent. of complete actinisation. Multiplying this partial actinisation of the paper (say 16·67) by six, we show that it would require about one hundred and twelve minutes, or six thousand seven hundred and thirty-two seconds, to actinise in the shadow of the room. Again using these figures, we show that as ninety seconds required to actinise in full sunlight is to six thousand seven hundred and thirty-two seconds, so is the time of proper exposure determined this morning, say seven seconds, to the time of proper exposure this afternoon in the shadow, which is eight minutes and forty-four seconds. To summarise these figures, we may say that the simple sensitiser adopted—that is, the silvered paper—will give a very near proximate of the proper time for exposure of any given plate when taken in connection with the standard time of actinisation, which we call a constant, and the exposure of the plate mentioned, as in the shadow of the room, was done without any other than this simple means. There need not be any doubt as to the use of the stops; one single stop will do for all exposures, when once this constant is obtained with any one of the series. So far as we are able to judge at this time, we prefer using the pinhole stop, which has given the results mentioned above. If any man ask, "Well, what of all this?" we can answer that it is an approximate method of arriving at the proper time for exposure of a given make of plates, and that too without any "guessing." In presenting this for your consideration we are not unaware that others have experimented in the same direction, nor that the emulsions on plate and sensitised paper are chemically different, but we are anxious to broach the whole subject for your consideration, hoping it may lead to investigation and some useful result.

Mr. FRISBIE: You mean by adopting the idea suggested in your paper you can get the exact time to expose your plates?

The PRESIDENT: Yes, any time of day. This paper which I have just read involved an immense amount of figuring, and I do not conceive that there is any possible way by which this could be put in any other shape than it is. Lieutenant Bruns and myself read it over, and it is as brief as it can be stated,

To arrive at these figures was a matter of considerable trouble. You have no idea of the amount of labour involved in the work. You don't have to expose a plate every day. You go out and take a picture to-day for instance, and find that a clear brilliant sunlight actinises paper in a given time. You may take that time as the basis for several days' work.

Mr. ATKINSON: Suppose there is no sunlight.

The PRESIDENT: Then you do not expose the paper.

Mr. ATKINSON: Then you cannot tell anything about it. I merely say that because for four years I used that very test in printing carbon prints. I had a small negative with a printing frame marked from number one to number twelve, and there was a slip of sensitised paper placed in that, and there have been times when I got fair negatives, but I consider it very unreliable.

The PRESIDENT: In regard to the constant (by which I mean the non-variable figure) upon which all this is based, the sensitised paper is exposed when the sun shines and you get a figure, which, as I say, lasts you all the year round. It is immaterial whether the sun never shines again. You have got nothing to do with that. You do not have to ascertain a new constant, you use the same one. But you expose a piece of sensitised paper to the light, whatever that light may be, and that gives you the second figure in your problem by which you arrive at the third.

Mr. ATKINSON: If you are testing bromide with bromide of silver, or chloride with chloride of silver, that would be a different thing, but you are testing one thing with another here.

Mr. RIPLEY: What do you say about the gaslight? I can take a picture by gaslight. Dry plates are made with bromide of silver, and the condition of this is in an entirely different state in the gelatine plate than in the albumen film, and is affected differently by the light and by different kinds of light, and I say that I can get a good picture in half the time by gaslight. You cannot blacken the albumen paper by gaslight.

Mr. NEWTON: It would undoubtedly be a valuable acquisition to photographers, whether professional or amateur, if you could come into the possession of some infallible guide in reference to timing any particular plate. The experiments named I tried quite a number of years ago in a little different way. I made a little round metal cylinder about three inches in diameter. It shut together, allowing for the roll of albumen paper a half an inch wide to come out of a little thin slot; and, instead of depending on the light to colour the paper, I painted the colour, pulled the paper out of the slot, and painted the colour which albumen paper would come to in a given time, and my experiments with the albumen paper showed me satisfactorily that it was not reliable, especially in different coloured lights. You take an orange coloured light, and it will act upon the chloride of silver about as quick as a white light. That is, any professional photographer who is printing on a day when the sky is clear and has a yellow light, will print his prints as quick as he would if it was a white light, and the action of that light on the bromide of silver would require at least double the time; and again, when it begins to be late in the day, say five o'clock this time of the year, it is not a very difficult thing to make an instantaneous picture, but it will take a pretty long time to make a print on a piece of chloride of silver paper. Then, again, there will be a little variation in your paper unless you try it every day, and your standard would be likely to vary the sensitiveness of your chloride of silver paper. It is not generally known, I suppose, that some acids are an accelerator and increase the sensitiveness of the chloride of silver. But I have made experiments in that direction, and I took what we call plain paper (starched or ordinary plain paper) and sensitised it. I once had occasion to make a picture that took all day to print it under a leaf. I wanted to get the anatomy of a leaf, and it was a dark green, and I had to expose that sensitised paper all day, and the next day I sensitised some paper, and after the wet had got off the surface of it I laid it, back down, on a five grain solution of citric acid. Now that increased the sensitiveness of it at least six times, and I could make the same print in two hours that it took me all day before to make. And whether the ordinary albumen paper is fumed would make a great difference in the action of the light upon it. In the exposure of a plate my rule is to over expose always, that is for a normal developer, and then I commence very weak, very low down. I make up my developer of the ordinary strength, and I take a little of it and put it in water and commence very weak, and I always have it a sure thing if I have got the right exposure. I have a couple of negatives—I would have brought them along if I had thought of it. One of them was exposed two seconds and the other twenty seconds, and any one looking at them and examining them would say that the two seconds' one was the one that was longest exposed, simply by the way that they were developed. One of them was exactly as good a negative as the other. There is a great deal to be said on developing negatives, and I am not sure that everybody will ever come to making one as good a negative as another. There are constitutional impediments in the way. You cannot educate some people so that they know a good negative when they see it, and they never will succeed except by chance in making a good negative. Now it is one thing to observe and another thing to perceive. I had a bookkeeper once in my employ who could not tell blue from green, or red from yellow, or anything of that kind, though he was an excellent draughtsman and a fine musician. His ear was all right, but he could not discern the difference between colours. I might say that the colour of that book, for instance, is green and the other side of it is blue, and I would turn it over for instance, and ask him which is which, and he could not tell me. He would say that there was some difference, but which would be the green and which would be the blue and which would be the yellow he could not tell. You could not educate that person; and a person that is undertaking to develop a negative after the plate has been exposed has got to have the faculty of perceiving as well as of observing. That is quite essential. Of course a person can by perseverance educate himself and overcome a great many of these difficulties. Now I had a gentleman that used to come to my house—a scientific gentleman, too, he was—quite a number of years ago when I was making collodion emulsion, and I gave him the formula and he made it, and he came to my house two or three times a week and begged me to do it because he could not make a negative that was good for anything. It was all fogged. He said that he had followed my directions exactly, and as I had given them to him; nevertheless, he said, the plate would be fogged. He

would take his emulsion and make a negative, and would come back the next day and bring me some of his results; they were utter failures. But he was indomitable. He stuck to it for six months, and he finally overcame all those obstacles, and can make as good a negative to-day as anybody. Now, another person would do that same thing after trying three times. There is a difference between people. One man has a good deal of a job on hand when he undertakes to make a negative, and that work to another man would be a very light job. The same as one person is a good mathematician, and it don't bother him at all to solve a problem, while another is a good chemist, and another is a good musician. You cannot make a chemist out of a musician, or a musician out of a chemist; and it is just the way with an artist. You cannot make an artist out of everybody, and a person, in order to be able to make a good picture, has got to be an artist as well as a chemist.

Mr. SPAULDING: I think Mr. Ripley and Mr. Newton have come practically to about the same conclusion, and it seems to be a very reasonable one, though I have not experimented on it. If I had a weight of 300 pounds to move across this room, and I had another weight of 3000 pounds to move across this room; supposing I could move the 300-pound weight across the room in five minutes, how long would it take me to move the 3000-pound weight across the room? Why, I could not move it at all, and it seems to me, Mr. Chairman, that this question of the sunlight has about something of that sort of thing to do in this case. It has been said that a great many of our plates contained both the iodide and bromide. It may be the sunlight when removed to a certain degree, as it is on dark days, for instance, cannot do work at all. If we believe the philosophers who tell us about the atomic theory of matter, these molecules are made up of certain atoms, and the sunlight has got something to do with the atoms of that molecule. There are a great many people who believe in the physical theory, and there are a great many people who believe in the chemical theory. But the sunlight has got something to do with the atoms of the bromide or iodide; it has got to produce a certain change in the atomic condition of the molecule, and whether it can do that depends on the strength of the sunlight and also on the weight of the atom that has got to be moved. Now, Mr. President, it might be that what you have suggested in your paper is quite available within certain limits, but it would not be available under other circumstances, and I do not believe, with all due deference, that it is well to claim too much for it.

The PRESIDENT: Well, of course, we made this test with a view to having this matter brought up for discussion here. We are not infallible, as you are probably well aware; but, acting on the theory which I have suggested, and, after figuring elaborately and carefully, you see the conclusion which we reached, and here is the negative made upon the basis of those figures about five o'clock this afternoon. We simply put the plate holder in its place, exposed it by the watch, and there is the negative.

Mr. NEWTON: In some instances some plates might be exposed twice as long as others, and by manipulation, by which I mean the development, you cannot tell which was exposed ten minutes and which was exposed five minutes, they would be so much alike.

The PRESIDENT: I quite agree that much can be done in developing. As an example of what you just said regarding development, by which I mean the manipulation of the plate in the developer, to bring about a result that nobody expected except the man who manipulates, I made a lantern slide for a person who is here now, and there being seven persons present, and several of large experience, I asked them to say how long exposure I should give the plate. They looked out of the window, looked wise, and varied between ten seconds and ninety seconds. We took the average of them, and made it thirty-five seconds. After exposure of one plate for ten seconds and the other for thirty-five seconds, I went in the dark room and developed both of them, and after they were developed the most learned photographer among them all picked out the one that had been exposed the least and said it was exposed the longest. It only shows you what the opinions are worth as a rule. How was it done? Why, in the development of the plate. I manipulated that plate; I juggled that plate, as you say, into being that which it really was not, that is, giving it strength and density; that which would never have happened except for being handled very carefully in the developer; and the plate which had been exposed the longest I handled very carefully, and kept back the development, and did not hasten it. In other words, I juggled that too, and the result is I got two excellent negatives.

Mr. RIPLEY: This question of over exposure and under exposure has been discussed quite lengthily and intelligently in the English papers for a year or more back, and a writer said that there was a very great question as to whether there was in fact such a thing as over exposure and under exposure; and I want to say that the article was a very sensible one, and he came to the conclusion that over exposure and under exposure depended altogether on the developer that was used and upon the man that handled it. Take our modern dry plates, both of the English and American manufacture, and there is a great deal more latitude in them than we are inclined to think. We make an exposure and throw our normal developer on it, and if it comes out right the exposure is correct, but a great many of us take no pains at all to decide as to whether it is going to be right or wrong, and if we think it is going to be wrong we take the proper steps to save it. With intelligent and careful workmanship you can expose two identical plates the extreme of short and over time and still secure good negatives, and you can not tell the difference between them, and it is hard to get a test that will tell what over and under exposure is.

The PRESIDENT: What have you more definite to say about this method, or theory, that has been proposed? Have you got anything very strong to say against it? If so let us hear it. What is your objection to it, beyond what you state? In my opinion you have not hit the nail on the head at all, if you will allow me to say so.

Mr. RIPLEY: Why, we prove it is non-scientific, and we prove that it is useless.

Lieutenant BRUNS: What is there, I ask, in photography that you know is scientific? Is there anything that is scientific in the art?

Mr. RIPLEY: There is a good deal in photography that is scientific, but it has never been found out. Take the best chemists of the world and no two of them will give you the same reason for the same result. Why collodion sen-

sitised to-day to take a photograph will give you a certain result, and that certain colodion kept a month will give you a totally different result in the way of producing a picture, is something that nobody can tell. We know it does do it, but we cannot tell why. I may mention that as one instance. Photography, as a science, is very largely tentative, and the relation of cause and effect in it is very little understood. There is lots of science in it but we don't understand it.

Lieutenant BRUNS: I agree that there is lots of science to be found in photography. I had studied up the subject of photography, the theory of it, and the chemistry of it, and I thought I knew something about photography, and I thought all I would have to do would be to come around here and say, "Smith, give me your developer," and that was all, and point to the camera and it was done, and I believed it was scientific, and if photography is an art it is based on the laws of science, and if it is based on the laws of science it is invariable and we can find the laws. I could not find any laws, and I said to myself, "I cannot take a picture until I know I will take a good picture. I do not know anything about photography; practically nothing, absolutely nothing. There is nobody in this Society but who can give me the most rudimentary instructions, but I will know something about it. I am determined about that. I know if I take the time I can make as good a picture as anybody else, but I might spoil three or four boxes of plates in getting a picture; but that does not make any difference. I get the picture all the same." And one of the principal reasons that has urged me to try to arrive at some conclusion in obtaining a proper exposure was this, that if I should by guesswork go out and get a beautiful picture, and my friend should come to me and say, "That is beautiful," I would say, "Yes, it is beautiful," and he would say, "How I would like to have you come and take my beautiful lawn, and make me another beautiful picture like that." I would have to say to him, "It is beautiful, but it is all guesswork, I do not know how I did it, but I got it."

Mr. WILLIAMS: The criticism that I make of this paper is, that I do not know how to apply the principle which you have brought out to any practical outdoor work. I have no interest in copying black letters on white paper. The subjects that I take with my camera are, we will say, like that print over there, with the cows under the trees. Now one of those cows is a white one, and some are dappled, and the white cow is fully exposed, and the red cow is not fully exposed. The difficulty in that picture, I suppose, is over exposure. It is generally so in all pictures. I would like to know how it is proposed to apply that to a landscape, or subject which has objects in the shadow and objects in the sunlight. I would like to know how it is going to help the artist or the photographer to judge what exposure is necessary to get the proper gradation of lights, and how to bring out the details and shadows successfully, and in that way make an harmonious picture. In my practice, and I do not claim to be proficient, the only way I can do that is in the developer.

Mr. NEWTON: There is another objection that has been just alluded to. In using that paper, if you have three or four different lenses (I generally take five, six, eight, ten, twelve, and fourteen-inch focus), and I make a picture with a six-inch lens, and I use another lens of twelve or thirteen focal length, of course I have got to give a longer exposure to the same object, and so your test would not apply to both in a case of that kind. While you use different focal lengths you increase the exposure by the focal length of the lens you are using. I hardly ever, if I am going out to make a dozen pictures, make them all with the same lens, and expose according to what I think right. Now to illustrate. On Election Day I went upon the Bronx River, and the ordinary exposure with a six-inch wide focal tube was two seconds with the smallest stop, and with the sun pretty well on my back; and then I turned around and made a picture down the river instead of up, and I gave seven or eight seconds where the shadows were heavy; and the last one I took, which was directly against the sun (which was shining against my tube unless I shielded it), I gave thirteen seconds, and while I was looking the other way two seconds would have been plenty; and none of my pictures were over exposed and none of them under exposed. I made good negatives of all of them. The thirteen-second exposure was as good as the two-second exposure, although one was a longer lens than the other. I will say just a word more while I am talking in reference to the action of light upon the sensitive film, and the theories that have been supposed to account for the phenomena in the main, that actinism was a property of light resident in all waves of light. That was not Becquerel's theory. But latterly that has been adopted with the exception of one chemist, who several years ago promulgated the theory that actinism had nothing to do with it; that it was purely mechanical. And those who recollect his theory, and the experiments that were made, will recollect that he proved to his own satisfaction the correctness of that theory; they were long, and extended, and very ingenious. He claimed that the force of the light impinged on the sensitive film made the image, and that chemical actinism had nothing to do with it. Now the other theory, that it is actinism and that it is resident in the light. In regard to that, in some experiments we have seen lately in some theatres, in reference to colouring the film, so as to photograph coloured objects, where you transpose all of that, you introduce a red screen under certain conditions, and you get more actinism on reds, and the greens, and the yellows, than you do on the violet and blue. Now where are you coming out? Where are you going to land? If that is so, the old theories in reference to the actinism being mainly in the violet seems to be on a weak foundation. Now light acts differently on different things; that is, in reference to mineral salts. You know, most of you, I suppose, that Professor Draper, as long ago as from 1843 to 1846, by a long series of experiments, showed that the yellow light had more actinism in it than the violet one, which acted on vegetable fluids, and right the other way when on mineral salts.

Mr. ATKINSON: The whole question resolves itself into this: that you take an over exposed plate—a man with a thorough knowledge of the art, with proper use of the developer, can accomplish something; but with an under exposed plate the picture is not there, and no amount of knowledge of development will produce it.

The PRESIDENT: You can find a gentleman in this room that will dispute that proposition; he maintains that an under exposed plate can be made as good as a plate that has been over exposed.

Mr. ATKINSON: That is dodging the question. If the plate has been under

exposed can it be made as good a negative as if it had been over exposed?

Dr. PIFFARD then stated in substance that Mr. Ripley said earlier in the evening that a plate can be exposed sixty seconds longer than it ought to be exposed and then be made to produce a good picture.

Mr. FRISBIE: Dr. Piffard hardly seems to arrive at the question. He assumes there that a one second exposure would have been a normal exposure sufficient to give you a good negative with well-judged developing, and the sixty seconds exposure, which would in some cases be an over exposure, that you would get a good negative even at that great length of time. But the question is, Can you get a good negative from an under exposed or a plate that has been very slightly exposed to the action of the light? I should say no, because the light has not had an opportunity to act upon the plate at all. It has been virtually in the dark in some parts of it. In the high lights you might be able to get a well developed negative, but in the dark shadows you get nothing, no matter what chemicals or strength of chemicals you use.

Lieutenant BRUNS: I want to answer two questions in regard to the sensitised paper. Of course, all my remarks are purely theoretical, as I have said before, because I have no practical knowledge of photography. I never took an outside picture in my life, and I do not know how to develop; but I premise my statement that I have some knowledge, theoretically, of photography. A gentleman here this evening has remarked something about taking an outside exposure in which he includes distant as well as near objects. He finds fault with the sensitive paper because it does not correct the condition that is universally recognised, that distance, as a general rule, does naturally over expose, and nearness under expose; but that should not fall to the lot of the poor sensitive paper. It is a condition that happens anyhow. It is a condition that has got to be contended with in some other way. It has got nothing to do with determining the time of exposure, and I believe Mr. Newton made some pertinent remarks in reference to the difference in the focal length of lenses. It is true you could not determine a constant where you would introduce a new condition under which that constant was determined. We determine a series of constants with certain lenses, and, if necessary, with a certain number of lenses; but, if you wish to change it, your constants are to be determined for each particular lens.

Mr. RIPLEY: A great deal has been said on this subject since the reading of the two papers, and I have remarked that photography as a science is largely tentative. The most that we know of a certainty in regard to photography, and the action of the light on the chemicals has been found out tentatively—that is, by experiment—so that when I called this method of determining the time exposures as non-scientific, I mean that the action of light on chloride and bromide and salts does not act in the same way. It depends on the condition that that salt is in, and I call the method unscientific, and, judging of your deductions from the same standpoint that we judge of what has been found out in photography, and the remark of Lieutenant Bruns that it is non-scientific, inasmuch as he has confessed that it is pure theory, corroborates my own view. And the remarks that have been made here in regard to the latitude of exposure which we have in the practising of our calling, and manipulation of the developer, and other means, and the cases that have been here cited, all show the latitude to be so tremendous, that it clearly and distinctly and tentatively shows the idea to be useless and not worth the trouble that it entails to put it into practice. I think that sums it up in rather a small nutshell.

The PRESIDENT: Notwithstanding all that the gentleman has said, and I have great regard for his views, I cannot see why—if I have a brand of Ripley plates of sixteen sensitometer, why, having tried one of them, and found by actual exposure that it takes seven seconds to get a good negative in a light where my paper sensitometer requires sixty seconds to actinise—why I have not got a good guide to know how to expose the next plate when the light conditions have changed with that same batch of plates.

Mr. RIPLEY: At that moment, on the same subject and all the conditions being the same, except possibly the quality of the light, do you mean to take into consideration those conditions?

The PRESIDENT: Yes, take into consideration that it is the same plate, but the light is changed. Now under those circumstances I use my sensitised paper and determine the right exposure.

Mr. RIPLEY: I claim that the light will change so that it will not affect your actinometer, when the plate will be affected. I have seen daylight so weak as regards affecting your actinometer, that it would show nothing in a long time when a bromide plate would be affected very quickly.

The PRESIDENT: You don't answer my question.

Mr. RIPLEY: Put your question exactly so that I can answer yes or no to it.

The PRESIDENT: Say, for instance, that one moment the sun is out and the next moment the sun is obscured, and I want to take a good picture. I hold my sensitometer out, and it takes that paper twice as long. Now what shall I do when the sun is obscured five minutes after I have taken the first picture? Won't my sensitometer be a fair guide for me?

Mr. RIPLEY: No, sir; it will not be a fair guide, because it will not give you the indication. It will give you the direction which you may work in, which direction may be or may not be reliable.

The PRESIDENT: Has anybody anything more to say about it?

Mr. WILLIAMS: I would like to know how the ideas which you have suggested in your papers are to be practically applied. In timing a picture there is no trouble in getting your high lights in the sunshine, but the shadow is the trouble. If you don't get detail in a shadow it will be a big black blotch. How is it proposed to apply the actinometer to a case of that kind and give us some help?

The PRESIDENT: The idea is put forth as an approximate method of arriving at a more proper exposure by knowing the force of the sunlight. This proposition is not perfect. We have experimented with it, and so far as we have experimented it has worked successfully, and we knew if we brought it up here for discussion that we would be knocked right and left, and we knew in the end there would be a discussion upon the development of plates, that would be interesting anyhow. Nobody can tell exactly to a second how much exposure to give, and no instrument can be devised because of the varying condition of the plates, and the surroundings are such that it would be impos-

sible; but we cannot conceive of any nearer way of arriving at a correct exposure than by ascertaining the exposure by the power of the light, and not guess at it. A man in taking a picture naturally looks up at the light he is going to have, and he makes his exposure. The method suggested certainly gives him a kind of approximate, and a very close one it appears to us; but you, gentlemen, must not expect too much from us. We cannot answer you positively in regard to the matter. We are, as I stated heretofore, humble in our pretensions, and you must deal kindly, and do not sit down too hard upon us.

Mr. BEACH moved that the Committee on Dry Plates take this matter up and report at a future meeting.

The motion was carried.

Mr. FRISBIE: There is one question I would like to ask. I do not know whether any one has ever investigated in that direction or not, and that is, After a plate has been exposed and the light has affected it, whether it is possible to apply any solution to that plate which would make it non-actinic, and yet the plate be taken out in the broad daylight and with some developer cause a deposit of the oxide of silver?

Mr. NEWTON: You can take an ordinary plate and let it lay in the light of your studio a week and make a good negative on it.

Mr. FRISBIE: What I refer to is this: I take my plate and expose it to the action of the light in the camera and then soak it in some solution which will have the property of preventing any further action of light on that plate when it is exposed to daylight again, and yet after that be able to bring out the image by some developer.

Dr. PIFFARD stated in substance that he had heard of such a thing; that Mr. Roche had shown him some plates which Mr. Roche said were developed in the daylight, and said that he could take a plate and make an exposure on the plate, and would then take it in the dark room and do "something" with it—Mr. Roche didn't tell him what he did with it—and would then take it out in the daylight and develop it.

Mr. NEWTON said he would take a plate that had been exposed to the light for a week and put it in a solution of nitric acid and bromide, and gave the proportions, and restore it to its normal condition and make as good a negative on it as though it had not been exposed at all. There is no question about that.

The meeting afterwards adjourned.

Correspondence.

Correspondents should never write on both sides of the paper.

JULY MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE.—VALUABLE DOCUMENTS FOR THE HISTORY OF PHOTOGRAPHY FOUND IN THE COLLECTION OF THE LATE M. BAYARD BY M. DAVANNE AND PRESENTED TO THE SOCIETY.

The Photographic Society of France held their monthly meeting on Friday evening last, the 1st instant, M. Davanne in the chair.

That gentleman informed the members present that he had just returned from Nemours, where he had been invited by the heirs-at-law of our late member, M. Bayard, in order to seek if peradventure among the photographic objects and proofs in their possession some might be of value to the Society in an historical point of view; if so, the heirs-at-law would be most happy to present such objects to the Photographic Society of France. M. Davanne then opened a cardboard and exhibited the contents.

1. A collection of photographic prints pasted on cardboard. These proofs were exhibited to the public on the 24th of June, 1839, in the "Salle des Commissaires-priseurs," and that for the profit of the victims of the Gaudeloupe. These images were examined with the greatest interest, they being over forty-eight years old. Time has laid its grasp upon them; they have faded and turned yellow, but the images are yet visible. By an article in the *Moniteur* of the 24th of June, 1839, we can learn that M. Bayard exhibited photographic proofs on paper one month before Daguerre published and gave his process to the world. The cause why the name of Bayard has not become a household word like that of Daguerre is because M. Bayard was very timid and modest in the extreme. Nevertheless, the process of Daguerre is, at the present day, set aside, and paper proofs now predominate. 'Tis true that the same system which he employed is not adopted; but he certainly must have the honour of having printed photographically the first paper proof. His process will rank him among the inventors of photography, and his name will be found beside those of Niepce, Daguerre, and Talbot.

M. Davanne then exhibited the second lot, consisting of several Daguerrian plates of a large size, and very well preserved. M. Davanne drew the attention of the members to the fact that such large plates were now very rare indeed.

3. An instantaneous proof of the Place Vendôme, representing the procession of the *Bouf gras*. This was naturally obtained upon a collodion film, as at that time the gelatino-bromide process was unknown. This proof can well bear comparison with the generality of instantaneous views made even at the present day; on this account they created a certain amount of surprise.

4. Two or three negatives of M. Bayard upon the "Siamoise" plan—that is to say, the same person represented twice shaking his own hand, painting his own image, fencing with his *sosie*, &c.

5. Several proofs on paper obtained by his first process, which consisted in coating paper with silver chloride, then exposing it to the sun's

rays until it became as black as possible: the paper was then floated upon a solution of iodide of potassium, the paper thus prepared was placed in the camera, the light acting upon it bleached it more or less; the result was an exact copy of the object to be reproduced.

A vote of thanks was given to the heirs-at-law. PROF. E. STEBBING,
59, Rue des Batignolles, Paris.

PLATES FOR PHOTO-MECHANICAL WORK.

To the Editors.

GENTLEMEN,—Referring to your leaderette in the last number of the *JOURNAL*, "Collodion *versus* Gelatine," and the suggestion contained therein, we beg to say that we have for some time past made special plates for photo-mechanical work, which yield negatives similar in character to collodion negatives.

We have a steady sale for these specially prepared plates, and have frequently received flattering testimony from gentlemen who employ them for photo-mechanical work. Herewith we send negatives for your inspection.—We are, yours, &c.,
MAWSON & SWAN.

Newcastle-on-Tyne, July 4, 1887.

[The negatives received leave nothing to be desired.—Eds.]

OUR FATHERS WHO ARE IN THE SOUTH KENSINGTON MUSEUM.

To the Editors.

GENTLEMEN,—Your correspondent, Charles Mason, appears to have made inquiries concerning the Fathers of Photography everywhere but in the right place. If he will take the trouble to go to the South Kensington Museum, Science Department, West Galleries, he will see my collection of "Our Fathers," including Daguerre, Rev. J. B. Reade, Fox Talbot, Mungo Ponton, Sir John Herschel, and Dr. Alfred S. Taylor, with a tablet underneath each containing the dates of their births and deaths and a brief record of what they did for photography.

Mr. Mayall, Bond-street, possesses a portrait of Daguerre; Messrs. Maull & Fox, Piccadilly, a negative of Rev. J. B. Reade; H. H. H., Cameron, Gothic House, Mortimer-street, W., of Sir John Herschel; and the *Photographic News* published portraits of Daguerre, Fox Talbot, and Mungo Ponton, a few years ago.

Portraits of Niepce, Robert Hunt, or Frederick Scott Archer, I never was able to obtain, but think it is to be regretted that they are not obtainable. The late Mr. Silvester possessed a portrait of Archer, and once promised me a copy, but I never received it. There are many other names among the early workers, also, whose portraits would be very interesting at present and in the future if they could only be had, and I think it would be worth while making such a collection and placing them where they could be seen at any time by those interested in photography. I handed my collection over to the Lords of the Committee of Council on Education for that purpose, and I think it very desirable for others to do likewise.—I am, yours, &c.,
J. WEAVER.

11A, Berners-street, W.

PHOTO-MICROGRAPHY.

To the Editors.

GENTLEMEN,—My attention has been called to a communication from "Procella" in your issue of the 3rd instant, in which the writer, after very earnestly insisting upon the necessity of an exact coincidence in the registering of the focussing screen and sensitised plate in photo-micrography, goes on to say: "If it were possible to remove the screen from the frame and substitute the sensitive plate for it, photo-micrography would be made a much simpler affair than it now is."

From the fact that the same idea is advanced in "Procella's" article in *THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC* for the present year, it is evident he has not read any of my communications on the subject heretofore published in *THE BRITISH JOURNAL OF PHOTOGRAPHY*, and I trust that I may therefore be pardoned if I repent a portion of same herein.

It is quite evident to all workers in this direction that no surface can be placed upon a sheet of glass by grinding—of sufficient fineness to serve for accurate focussing—with even moderately high powers. In my search some years since for a suitable medium for this purpose I found that an ordinary gelatine plate, which had been exposed to a flash of white light, developed to a slight smokiness without density, washed and fixed as usual, and finally bleached with a solution of bichloride of mercury, made so perfect a focussing screen for this purpose that nothing further could be desired. I claim no originality in this application of a dry plate, as my attention was called thereto by a writer (whose name I have forgotten) in one of the English journals. But my method of using it was original, and, I think, fulfils "Procella's" requirements most completely.

My camera is provided with the ordinary focussing screen of fine ground-glass, which is hinged so as to drop out of the way when the plate holder or "dark slide" is to be attached to the box. This ground-glass screen is only used for securing an even illumination of the field and arranging the object in its desired position thereon. These preliminaries

effected, the usefulness of the ground-glass ceases, and it gives place to the prepared gelatine plate, which is used as follows:—

The plate holder is *single*, with slide and back both entirely removable, leaving only a framework, which is placed in position on the back of the camera and secured by a spring catch. The bleached gelatine plate is now put into the framework (film aide toward the object), where it occupies identically the same position as will be subsequently filled by the sensitive plate. A focussing glass is applied to its back, when it will be found that the most delicate adjustment can be made quite as readily as with the ordinary table microscope. The proper focus secured, nothing remains to be done save to remove the frame from the camera, to restore the slide and back, and insert a sensitive plate in the dark room, when the exposure can be made with an absolute certainty that focussing screen and sensitive plate "register" exactly. Should "Procella" or any other of your readers desire more precise information on this subject I shall be pleased to supply it to the best of my ability.

I also venture to correct an error into which "Procella" has fallen in his article in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC previously alluded to, in which he says that the photo-micrographic camera of Bausch & Lomb is constructed to be used *with an eye-piece*. Having owned one of these cameras for some years, and inspected several others, I may say that they all were made to use *without an eye-piece*, and that no possible provision for the attachment of the latter to any of them had been made.—I am, yours, &c.,

W. H. WALMSLEY.

De Lancey-place, Philadelphia, June 19, 1887.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

W. WALLIS.—We have forwarded your letter on to Mr. Barrett.

M. B. (Herts).—So far as we are aware, no one keeps dry plates on patent plate in stock. No doubt any maker would supply them on that kind of glass to order if required.

E. SHAW HARPER.—1 and 3. It is strictly against our rule to pass an opinion on the merits of different makers' goods.—2. There is no patent for the diaphragm. It is a very convenient form to employ.

J. ALPHANT.—Photographs can be taken in the camera without a lens. All that is necessary is to have a minute orifice in place of the lens. This system of working has no practical value, still it is a possibility.

S. W. H.—If the material with which the mounts are printed is really silver the particles becoming detached will not injure the photographs. The only way of ascertaining if it is silver is by a chemical analysis.

NEWLYN.—The yellowness is due to imperfect fixation. If the bath was the strength you say, they must have had but a brief immersion. We imagine there must be some mistake with regard to the proportion of hyposulphite of soda used.

R. MERRY.—Before commencing to repolish the cameras the dirt should be carefully removed with soap and water. French polish really for use is supplied by most oilmen. It will be better for you to purchase it than to compound it for yourself.

OPERATOR M.—We scarcely understand your query. By "portraiture" do you mean lighting and posing the sitter? If so Bigelow's *Album* would possibly answer your purpose. It is out of print, but you will doubtless be able to obtain a copy by advertising.

J. A. N. says he expects an order to take some very large photographs shortly, and asks if there is any one who lets large cameras and lenses out on hire.—No doubt some of the dealers in second-hand apparatus will supply what our correspondent requires on loan. Let him try Messrs. Sands & Hunter or Mr. Morley.

C. G. TURNER has an old oil painting to copy which is very dirty, and asks whether it will be safe to wash it with water.—The picture may be sponged with clean water with safety. If water alone will not remove the dirt, a little curd soap may be rubbed on the sponge. The soap must, of course, be thoroughly washed off before the painting is dried.

W. SHEPARD writes: "I am making a wooden portable studio, eighteen feet six inches by eight feet by seven feet six inches high at eaves. Will you please advise me in your next issue as to quantity and position of glass for same?—Let our correspondent make four feet six at either end opaque and have all the rest glass. Thanks for the cutting. The idea is absurd enough.

RURAL.—As no less than three brands of plates give fog in your hands we suspect that the fault rests with you. Possibly your dark room light is not sufficiently non-actinic. See to your window if you employ daylight. For taking groups of children indoors employ a portrait combination, so as to secure rapid exposures. We imagine our readers would not care for an article on the subject you mention.

INQUIRER (Leeds) wishes to know how unmounted prints can be prevented from curling up. He says those issued by some of the large publishing houses have not this tendency to the same extent as his own have.—If the prints be rolled with a very heavy pressure on a burnished steel plate they will have but little tendency to curl afterwards. Squeegeeing the print while wet on to a glass plate and allowing it to dry will also remedy the evil. Of course the glass must be rubbed over with French chalk to prevent the print from adhering when dry.

A. E. SMITH sends a print from a wood block on common paper, which has been hanging in his studio for a couple of years, and calls our attention to the discolouration of the paper. There is nothing at all unusual in this. Most common paper made from wood fibre will show a marked change with only two or three days' exposure to the sun's rays, particularly if it be kept in a moist atmosphere. The example sent has discoloured badly.

G. MONRO complains that when he attempts to mount photographs with gelatine he cannot succeed, owing to the gelatine setting before he can coat the print all over; hence, when it is laid on to the mount it is not even, owing to the inimpiness of the gelatine. Coignet's gold medal gelatine has been employed.—The gelatine named is quite unsuitable for mounting prints, for the reason that it sets so quickly. The best kind for mounting purposes is one of a poorer quality, such as that known as soap gelatine. Messrs. Nelson, Dale, & Co.'s "No. 2 Soluble" is a very good gelatine for mounting photographs with. It is free from acid and does not gelatinise rapidly.

J. L. R.—1. Unless the spots can be seen before the plates are exposed, they are no doubt produced by air-bells adhering to the film while being developed.—2. The fogged appearance in the centre of the negative is caused by flare spots in the lens. It may be cured by altering the position of the stop.—3. A formula for the potash developer will be found on page 311 of the ALMANAC.—4. Yes, by adding a small quantity of tartaric acid, and exposing the solution to sunlight. But, on the whole, it is better to use the solution freshly mixed.—5. The green colour is due to the print being under exposed. With a longer exposure, and a shorter development, the colour would have been much improved. Thanks for kind offer.

C. A. TIMMINS asks: "Would you, in 'Answers to Correspondents,' give me a few practical details how to obtain enlargements on platinum paper? I have two lenses, both Ross', one rapid cabinet lens and rapid symmetrical 8x5. I want to enlarge from quarter-plate to 12x10."—In the first place, an enlarged negative is necessary. This is obtained by making a transparency from the original, and then from that making an enlarged negative. From this the platinum print is made in the ordinary manner. Either lens will serve for the enlargement; the shorter focus one will be the more convenient to employ. By the aid of the solar camera direct enlargements may be made by the platinum process. But we presume our correspondent is not the possessor of one.

W. A. M. writes as follows: "Two years ago I had a new studio built, and a few days back a square of glass was accidentally broken, and I noticed that the pieces had a decidedly yellow appearance, which the glass did not have when it was new. I have had another pane taken out, and that is just the same, as you will see by the enclosed pieces. Is it usual for glass to change like this? and does it not make the exposure longer when it does?"—It is by no means unusual for glass to change in colour by exposure to light, though rarely to such an extent as this has done in so short a time, that is, supposing it was colourless, or nearly so, when the studio was erected. Some kinds of glass do not change at all, or very little indeed. Of course when glass becomes of such a non-actinic colour as this has the exposure is, necessarily, somewhat prolonged.

E. A. C. will be much obliged by the Editors telling her, in "Answers to Correspondents," the cause of the mildewed-looking spots in the middle of the enclosed silver print. They showed themselves as soon as dry, but are the only ones out of a batch of fourteen prints. E. A. C. has noticed the spots before, among many also, sometimes larger and more marked.—2. Will the Editors kindly say what can be added to starch when used as a mountant to counteract any acid? E. A. C. has used it successfully for long, but one lot of prints mounted turned yellow as one sent. She has been told the starch must have been acid. Is this so? The starch is made with boiling water, but not allowed to boil.—1. The spots are due to sulphuration in the fixing bath. Either it is too weak or the prints have been allowed to stick together while in the solution. The latter is the most probable cause.—2. Good starch is scarcely likely to be acid. If it is it should not be used for mounting photographs. The Glenfield white starch may be relied upon. The partial yellowness of the mounted print is not caused by the mountant, but arises from the same cause as the spots in the unmounted one.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—There will be an excursion to Winchmore Hill on the 9th instant. Train from Moorgate-street (Great Northern Railway), twenty-six minutes past two p.m. to Winchmore Hill Station.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, July 13, will be on *Extemporising Apparatus in Case of a Break-down when Away from Home*. Saturday outing at Winchmore Hill. Train from Moorgate-street at twenty-six minutes past two.

In England, at a town called Deal, there is a pier, and when any amateur photographer ventures there with his camera he is compelled to pay two dollars and a half for the privilege of taking negatives, because the local photographers have represented to the authorities that amateurs were causing an injury to their trade. In the United States, at the head of Lake Michigan, a licence is now demanded by the authorities at the town of Mackinaw of fifty dollars.—*The Eye*.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1419. VOL. XXXIV.—JULY 15, 1887.

THE BEST MODE OF BACKING PLATES.

WE return to the consideration of the practical treatment of this most important operation in modern photographic methods. Some of our readers, no doubt, will fail to see that the subject merits the importance we attach to it; but we unhesitatingly state that there are few negatives taken with unbacked plates that would not have been the better for the adoption of the method, and that there are some subjects which it would be absurd to attempt without this aid to accurate representation.

Let us first take into consideration our minor preliminary assertion. Who with practice in portraiture but has had an experience of the difficulty of taking a good negative where were violent contrasts of light and shade, or large masses of white in the subject depicted. A gentleman in evening dress, or even with a black coat and immaculate white cuffs, is a good example. Every one who has done much portrait work is familiar with the manner in which a beautiful grey fringe surrounds this white linen in lieu of an almost perfectly jet black; while as to a lady in a white dress, especially if posed against a white, or nearly white, background, it is a subject from which it is next to impossible under ordinary circumstances and with an average plate to obtain a negative free from "fog," this "fog" being simply a universally diffused haze from reflected light or lights. The whole cause of these disastrous results is explained in our last article. The light penetrates the film in a diffused form, and is reflected at the back of the glass of the plate; *i.e.* the place where two "different mediums"—glass and air—unite.

But these effects are as nothing compared with those obtained when the highest lights of the picture are brilliantly illuminated, while at the same time many large spaces receive but a dim light, yet need sufficient exposure to render them visible. Such cases, for example, as would be found in photographing interiors with windows on the farthest side, as in a church, for instance, or the glimpses of bright clouds between and about the spreading branches of a large tree. Any one who would attempt to obtain on an average dry plate a good negative free from halation from such subjects is certainly not a "past-master" in his craft.

We use the term "average dry plate" advisedly. There are dry plates and dry plates; some will give halation with almost every subject, though not invariably visible to the non-observant, while others will give a very fair negative, notwithstanding a stiff amount of contrast. But the two kinds of plate are easily distinguished without any legerdemain. If any one have a thickly coated rich-looking plate, with a nice yellow-toned surface by reflected light, he will not have much to trouble him in this direction until the circumstances be-

come exceptional; if, on the contrary, he employ a plate with a thin translucent film, he must expect fog upon his delicate shadows and half tones, a lack of brilliancy in the general effect. A thin plate is not to a great extent the only cause of these defects, be it said; nor can it be asserted that there are no counterbalancing disadvantages when these evils are absent. We have no intention at this moment to discuss the advantages of thin plates; all our space, and much more, is needed for elucidating the particular subject we have selected.

When astronomical work is considered, the greatest difficulties of all are encountered, and we are strongly of opinion that it is very easy indeed to produce "coronal" effects from no other cause than reflection at the back of the plate.

M. Jaussen soon became aware of this fact, and he used a backing of asphaltum to prevent the reflections. Long ago, the dry-plate maker, when collodio-albumen and its joys were fading into the distance to which it had been relegated by the superior claims of the then novel quick processes, daubed his plates alternately with anatto, lampblack, or burnt sienna rubbed up with water. Still later did Captain Abney show us the beauty of collodion containing dissolved aurine and roseine (*i.e.* magenta of a sort), and the beauties were not imaginary.

In the practical photography of everyday life, who would think of using a backing of black varnish to his plates? It would take a lifetime to remove it from a large batch of plates.

Then as to collodion. Let any one coat with tinted collodion the backs of a few dozen plates, with their occasional patches of emulsion wasted upon the wrong side, and then, after exposing, try to develop them in a rapid manner, and he will soon find the pecuniary cost and the practical nuisance in comparison with other methods. If he happen to be a sub-tenant holding rooms over shop premises we only venture to express the hope that he may not experience the pleasures of a lawsuit for damages to goods, owing to an overflow caused by the stoppage of his exit pipes, by pieces of collodion washed off the back of his plate during development.

If he trust to the old expedient of applying a paint made by the simple admixture with water of certain black or coloured pigments to the back of his plate, and there allowed to dry, his trustfulness will not by any means receive its full reward.

This is a statement easily verified. Let the experimenter paint a piece of plain glass with lampblack on one side only. He will observe it to exhibit a rich black by reflected light, the cause being that the index of refraction of water being—in comparison with that of air—so little removed from that of the glass itself, most of the rays incident upon it pass into this only slightly different medium, and are then absorbed by the black particles; and in that condition a dry plate so treated

would be in the best condition to exhibit freedom from halation with difficult subjects.

Let half an hour elapse, however, or, to expedite the examination of the effects from given causes, let the plate be warmed to facilitate the expulsion of the moisture. An extremely visible alteration will be observed: instead of the rich black (we are examining, it will be remembered, a plain sheet of glass to facilitate eye observation) we shall notice a cold bluish grey. The fact is, the water has evaporated, and over the larger proportion of the surface is replaced by a "different medium," air; so that reflection at the back at once reappears, modified only by the proportion (small, we may be sure) of particles which are so attached to the glass, that there is no film of air between them. For backing purposes this small proportionate area of what, for want of a better word, we may term optically cemented particles, is all that is available. What that proportion is may be guessed at by any one observing the reflected image, or rather images, of a very bright object. While the pigment paste is wet there is only one image to be seen; when the water is evaporated entirely there are two images visible; and we have to say that under no circumstances ought a backing to be accepted in practice which, after the lapse of, say, a day, allows two reflected images—one connected with the front and the other with the back surface—to be easily distinguished. How to avoid this duplicated image will form the topic of our concluding article on this subject, which to us appears of vital moment where high-class results are the object of attainment.

THE Convention of 1887 is now past, and takes its place in photographic history. Those who peruse the transactions of this body in the present and last week's issue of this JOURNAL will not fail to arrive at the conclusion that, with a greater amount of enjoyment in the form of excursions than it is the good fortune of most to condense into one week, there was also a greater amount of real solid business done than has ever been achieved during a similar period since photography was ushered into existence. That the Glasgow meeting will ever be equalled we can only hope, that it will be surpassed is extremely improbable. But the enterprising men of Birmingham, at which town the Convention of next year is to be held, will do all that in their power lies to ensure success.

92° FAHR. in the shade. This temperature was registered one day last week at Greenwich Observatory, and from 87° to 90° on several other days. When this temperature is reached, and is maintained for some time, a large amount of inconvenience and trouble is experienced by photographers. The "shade temperature," as registered out of doors, gives but a faint indication of that which prevails in the studio, where it has proved most trying alike to the sitter and the artist of late. In some studies—those of the old-fashioned glasshouse type—the heat, on some days, has been almost insupportable. Only those who have worked under existing conditions of temperature in the old collodion days, can fully appreciate the advantage and convenience of dry plates in hot weather. Now there is no longer the constant fear to distract the attention of the operator, that the plate will become dry before it can be exposed and developed, or the old dread of that old summer plague, "oyster-shell markings," to say nothing of the depressing and exhausting fumes of ether and alcohol in an ill-ventilated dark room. Imagine working wet collodion, for landscapes, this weather, in a small, stifling tent, with the collodion almost, if not quite, boiling as it was poured on the plate; yet it was done, and successfully, too. The modern photographer can form but a small conception of what the wet plate worker had to endure when working in an excessively elevated temperature.

Those who only use dry plates have very little idea of the difficulties which have to be encountered in their manufacture throughout

the hot summer months. During the past few weeks the consumption of ice in some of the larger establishments has, we are informed, amounted to several tons—indeed, of late, it has formed a no inconsiderable item in the cost of the plates. Those employing the Woodburytype, colotype, carbon, or any other process based upon gelatine, have also suffered the greatest inconvenience—a large proportion of the work having to be done in the night, or the very early hours of the morning. Fortunate are those who have access to a good supply of spring water just now. Although the temperature of the atmosphere may register 90° or more, it is rarely that spring water exceeds 52° or 54°. Vessels immersed in this, when freshly drawn, soon have their contents cooled down to a moderate temperature.

It is to be regretted that the manufacturers of cold air machines do not see their way clear to supply a smaller machine than they do at present. Such an apparatus, if it could be obtained, would find many useful applications in photography where ice is now employed. The smallest machine now in the market, costs, we are given to understand, about one hundred and twenty pounds, and has to be driven by a two horse-power engine. This size machine is far beyond the requirements of photographers, as it is capable of freezing several tons of meat and retaining it continuously in a frozen condition. If a smaller machine, which might be driven by a small gas engine, could be had for a moderate sum, few dry plate makers, we imagine, would be without one. Apart from the economy of a cold air machine, when once it is installed it possesses another advantage. When ice is used for cooling dry plates the moisture condenses on the top of the refrigerating chamber, and would drop on the plates unless special precautions were taken. But, with the machine, the degree of cold obtained is so intense that it is sufficient to convert the moisture into ice, which attaches itself to the walls of the cooling chamber. Some dry plate makers, we know, are using the larger machines simply because they could not procure smaller.

WHAT proportion of the silver consumed in sensitising the paper remains in the finished prints?—Various estimates have, from time to time, being given. Some have put it down as low as one per cent. only, while others have given it at five per cent., and higher. It is manifestly impossible to form any thing like a correct estimate to suit all cases, as so much must depend upon circumstances. For instance, if the paper be sensitised on a very strong bath, the amount of silver in the finished image will not be proportionately so large as if it had been sensitised on a very weak one. Again, the amount of chloride with which the paper is salted is an important factor in the case. So, also, is the negative from which the print is made. If that be a strong one, it goes without saying the chloride reduced in the printing will be far greater than if it be a very feeble negative. We refer to this matter here as some correspondents have recently made inquiries on the subject.

AN inquiry on a kindred topic to the above has just reached us. A correspondent wishes to know the relative proportions of silver and gold in the image of a paper photograph. This is quite as difficult a question to answer as that just referred to, because here again all must be dependent upon conditions. A print which has been deeply toned, of course, contains far more gold than if it were only lightly toned, and proportionately less silver. A few years back, Mr. William Bedford showed, at the Photographic Club, an ingot of gold which he had obtained from half a hundredweight of spoilt prints that had been toned and fixed. The ingot weighed one hundred and seventy-five grains. In addition to the gold, four hundred and thirty-five grains of silver were recovered. This showed that the image in Mr. Bedford's pictures consisted, as nearly as possible, of two and a half parts of silver to one of gold. It must be borne in mind that this gentleman always tones his pictures to a rich purple tint. If the prints had only been toned to a light reddish brown, then the proportion of gold would have been less and that of the silver greater.

ADVERSE criticism on the new coinage is almost universal, though it is chiefly confined to the effigy of the Queen. This is certainly disappointing as a likeness, which we were led to expect before the coins were issued, and, what is more, the portraits on the different

coins are not identical. They vary almost as much as those issued by the different illustrated papers. The effigy, be it a good or a bad likeness, should be the same on every coin. There is no reason why the dies should not be produced by photo-mechanical means, which would secure uniformity. From a negative a gelatine relief might be obtained and reproduced by electrotyping, then from the electrotype dies could be produced by pressure under the new system.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

ON Wednesday evening, as announced, the chair was taken by Professor Herschel.

After a few announcements relative to the further business proceedings and excursions of the Convention, Mr. J. J. Briginshaw delivered a brief lecture on the phenomena of polarised light, and the room having been previously darkened, a great number and variety of suitable subjects were projected on the screen by the lantern-polariscope.

The Chairman followed with some remarks complimentary to the lecturer, and spoke of the importance of photographers studying this, as yet, imperfectly understood branch of physics.

Thereafter a large collection of transparencies, including general scenes, views taken during the excursion the day previous and that same day by Mr. Armstrong and several others were shown on the screen—the whole being much appreciated by the audience.

We may here observe that although the lecture hall was large and closely seated, yet such was the number of those present that not only many were compelled to be content with standing-room as best they could find it, but several late comers had to take up a position outside the capacious door of the hall. Among the views were some of the "crack" yachts, including the famous "Thistle," for which the Clyde is so justly celebrated.

On Thursday evening, Mr. W. Lang, jun., presiding, the following business was effected:—

Mr. J. Traill Taylor exhibited and described three detective cameras, of which an account will be found elsewhere.

Mr. Jerome Harrison described the nature and uses of Pumphrey's films, and showed a film holder for using with them.

The following papers were read:—

PRETENDED PHOTOGRAPHY IN NATURAL COLOURS.

By W. E. DEBENHAM.

A SUBJECT which occurs to me as being one with which the Photographers' Convention may properly deal is that of processes for colouring photographs put forward as discoveries in photography. Every few years such pretensions have been advanced, commonly in connection with some old, abandoned, and repented methods of applying paint; but recent occurrences demand, I think, that something more than passing notice should be taken of such pretensions, and the publicity which the proceedings of the Convention enjoy may, I think, properly be used to help to inform the public of the truth in the matter. Not only do photographers suffer in public esteem by their inability to produce nature-coloured photographs, which, by means of bold advertisements and untruthful paragraphs in some even of the leading newspapers, the public have been led to suppose are now accomplished by So-and-so's wonderful discovery; but when the time comes for these false pretensions to be exposed, the public, disgusted with having been taken in, is apt to regard photography itself as being associated with unworthy proceedings.

I was consulted some time since—probably from one to two years ago—by a gentleman who had had some connection with public companies, as to his taking an interest in a process which had been introduced to him as one of photography in natural colours. He sent me the specification, and when I next saw him I told him what the process was, and gave him my opinion that to bring it out as proposed would be grossly fraudulent. It did not occur to me that any one possessing any knowledge of photography would suppose that it had any value on its own merits, or that money could be made by it in any other way than by using it as an instrument of obtaining money by a false pretence. Independent of any want of novelty, the conditions of the process—backing up a transparency with a sheet of painted paper—appeared to me to hamper the artist to such an extent, from the difficulty of judging of the effect which his work on a plain tracing would produce when viewed through the transparency in optical contact with it, and from the difficulty in preventing stretching of the tracing and ensuring accuracy of register under the squeegee, that I considered that he would be hopelessly handicapped compared with those who painted photographs either in the usual way or behind the image, as in the

crystoleum and Lambert processes. Indeed, I should not be at all surprised to learn that the Cellierier Company have adopted the latter means—painting direct upon the back of the film—in place of that with which they started.

After the exposure in the photographic papers of the fictitious character of the Cellierier claim to the title—"Photography in Natural Colours"—their representative wrote that "the Board gave instructions to withdraw and discontinue any such heading to their processes (Cellierier and Parkes), as they do not wish to adopt any name of a possibly misleading or deceptive character." After this it is disappointing to any one who expected the Board to act up to this profession, to find that the title substituted for "Photography in Colours" is "Photographs in Colours," which is very much "such a title," and is certainly misleading. To my mind the only difference in the meaning of the expressions is, that one describes a process, and the other the pictures produced by that process; but both imply that the colours, equally with the drawing, are the work of nature, and not of the hand. On this point, however, as the question has been raised, I should like the opinion of the Convention whether it confirms that which I hold, and which I have found to be that of the public, or not.

Another process which has been recently announced as photography in colours is that of Mayall. In the *Globe* of May 17, in a paragraph headed, "New Discovery in Photography," it is said that Mr. Mayall "has discovered a means of photographing in colours." "The new camera does its work in colours almost instantaneously, and what rich and delicate colouring it produces!" Now it transpires that Mayall's is a hand-colouring process, and there certainly is no comparison between the credit due to the originator of any colouring process (assuming it to be original) and the honour to which such a discovery as that heralded in the *Globe* would have entitled its inventor. It is, therefore, to be regretted that in a letter of Mr. Mayall's which appeared in the *Globe* a few days later he did not distinctly disclaim the pretentious puff forward in his behalf, but wrote in such a manner concerning wave lengths—quite irrelevant in a painting process—as would induce many non-scientific people to believe the claim to be genuine.

The writer in the *Globe* may have been misled by Mr. Mayall's heading: "My New Process for producing highly-finished Coloured Photographs without the aid of an Artist." A person who applies paint to a photograph is certainly a painter, even if a bad one; and with regard to colouring photographs, the words painter and artist are used and understood synonymously. If the words "without the aid of a painter" had been used in Mayall's heading there would have been a direct and obvious misstatement, which some might prefer, as bolder, to the suggestion implied by the words, "without the aid of an artist." Now, although "artist" is, as has been said, understood with regard to photographic colouring to be synonymous with "painter," and so it may be said that a photographic colourist must be an artist, even if a very bad one, whilst he exercises the art of colouring photographs; yet he may do them so slightly or so badly that it may be argued that in one sense he cannot be called an artist. I have not seen Mr. Mayall's coloured productions, but I understand that a gentleman attending your Convention—Mr. J. Traill Taylor—has an example which is to be shown, and you may be able to judge whether the colourist is entitled, in the sense of ability, to be considered an artist or not.

What is to be said of the conduct of some of the leading newspapers in such matters? If a patch of granite without a grain of noble metal in it is to be offered to the public as a rich auriferous deposit, the papers will not so far lend themselves to the transaction as to call it a great discovery, and speak on their own authority of the purity and abundance of the gold there found. Why should they be so much less scrupulous when photographic matters are in question? Whether there is the smallest justification for the praises that have been lavished upon the beauty of the results of any particular colouring process may be judged by those who have seen them. There certainly is none for statements that the colours are the work of nature; and it cannot be supposed that writers who do not scruple to make such statements will hesitate to add flattering descriptions as to beauty, especially as the last-named quality may, after all, be said to exist only in opinion; and a writer might even maintain that he considered that to be beautiful which in the eyes of most people would be considered vulgar, trashy, dingy, false, or gaudy. Are the untrue statements that have appeared due to false information derived from those likely to profit by them, or are they due to the incapacity or venality of the writers? This is a question which it appears to me the proprietors of the newspapers in which such puffs have appeared should, for their own honour and interest, investigate, and to which they should give some sort of reply, at the same time that they insert a withdrawal of the puffs as publicly as they have made them.

It is certainly possible for a journal to guard itself against being made the instrument for propagating untruthful puffs in scientific or pseudo-scientific matters. This is proved by the fact that they cannot, so far as my observation goes, be got into the *Standard*. I don't suppose that this journal is quite alone amongst leading newspapers in being clean-handed in this respect. Perhaps it is in the knowledge of some of the members of the Convention which leading papers have, and which have not, lent themselves to the misstatements referred to. If the present discussion should induce some of the offending or misled journals to

make the *amenité* suggested, and cause them to be more careful in the future, it will not have been in vain.

METRICAL MEASUREMENTS.

By THOMAS BEDDING.

I VENTURE to hope that if at this Convention, which at the moment of writing bids fair to be attended by a preponderance of, I will not say professional, but business photographers, some little time is devoted to the consideration of a purely commercial matter, in which our non-practising brethren are as intimately concerned as ourselves, the departure will not be without its advantages, however slight. Harking back for precedents and inspiration to the literature of the Derby meeting, one feels a strong inclination to follow the beaten track instead of prospecting round on one's own account, and it is only the danger of clashing with somebody else that has weighed with me in the choice of so comparatively an out-of-the-way subject. But for these scruples, the exquisite variety of the *debutant* would infallibly have lured me into the fascinating mazes of orthochromatism, or photography in colours, or the recent and continuous opposition to the employment of ammonia in the developer. As it is, I must dissemble, and leave to some one like the President the congenial task of pulverising the natural-colourists, the potentialities of orthochromatism to Mr. Wellington or Mr. Edwards, and the philosophy of development to its own particular guardian angel, Mr. Pringle. As you will have inferred from the title of the paper, I intend going into figures.

Now from figures, on the authority of the right honourable gentleman the Member for Midlothian, you can get very respectable poetry, not perhaps as musical as Robbie's or as sonorous as Scott's, but still something rhythmical, if only blank verse. I shall not test the truth of this; I only refer to it in order to quiet those of you who are inclined to be disagreeable because my subject threatens to be so dry. Most of you have, at some time or another, "done" a British Association week, and you must have noticed how sparsely attended has been, for example, the section in which Professor Cayley affably discoursed pure mathematics, and how crowded that where Sir John Lubbeck airily prattled about ants and other interesting little people. I hope I shall not be treated like poor Professor Cayley, for if you will wait to the end, you will find that although I may not have quite realised Mr. Gladstone's enthusiastic belief, you will at least have had plenty of feet and metres, which, as you know, are the very framework of all poetry.

To come to the point: I advocate the adoption of the millimetre instead of the inch or its fraction as the unit of all photographic measurements. Of course it sounds revolutionary, this sweeping condemnation of the dear old linear inch, which probably arrived with Julius Cæsar, and equally, of course, the cultivation of the millimetre in its stead must be a dream; but, gentlemen, all changes are revolutionary, and dreams are the motive-power of progress. The metrical system of measurements is commonly called French, thus leading the unthinking to suppose that it only flourishes in the land of its origin. Nothing of the sort. In every capital from Madrid to Constantinople, from Christiania to Rome, photographic apparatus and plates are made to metrical scale. The system, in fact, is European. The United Kingdom alone holds aloof from it, and adheres to the antediluvian inch, just as it adheres to its own indefensible currency and many other anachronisms that make people of a progressive turn of mind very angry with her. But we shall have to come to the millimetre some time, just as by stress of circumstances we shall be compelled to reform our coinage. Manufacturers are the chief sufferers by the present state of things. For example, the maker of dry plates, following the standard scale of sizes, gets his glass cut to inches, halves, and quarters, and, when ordered, to eighths and sixteenths. He quotes for the chief foreign sizes in his price list, but he only supplies them upon indent, for he has not the courage to stock them. It is different with the French, Belgians, and Germans, some of whom, as you may see from the advertisements, make and stock all their goods in English sizes. Somebody may possibly whisper, "What about Continental tariffs?" I reply that the superiority of most British goods over foreign ones is so great that if they were made and stocked in Continental sizes, and systematically pushed, nothing but cent. per cent. *ad valorem* duties would shut them out. Even now, under the present slovenly régime, the European sale of some of our products is great, but it might be a hundred times greater. Foreign dealers and photographers desirous of trying our specialities in metrical sizes find that they must wait days, weeks, until they are made—a diversion of which they soon tire. Consequently they patronise native products at a gain of time and a slight loss of quality. Again, suppose a photographer at home wishes to try foreign papers or plates which do not happen to be made in English sizes; his slides and frames will not take them unless adaptors and carriers are made, which means a loss of time. From these two illustrations you will see that in consequence of the tenacity with which we cling to the old order of things, commerce and the individual are at an appreciable disadvantage compared with the rest of Europe.

The permanent change from inches to millimetres would involve no trouble at all to makers of glass, cameras, papers, cards, ebonite, porcelain, frames, &c. Some of them, of course, work to the latter scale at

present, but, as I have shown, only intermittently; it is a pity they won't keep to the small unit altogether, for then we should get more accurate measurements than we do now. In regard to dry plates, the two sizes in most common use among us are $4\frac{1}{2} \times 3\frac{1}{2}$, or *carte-de-visite*, and $6\frac{1}{2} \times 4\frac{3}{8}$, or cabinet. On the Continent the two sizes most widely used are 90 mm. \times 120 mm., and 130 mm. \times 180 mm., which, when reduced to inch measure, are respectively $4\frac{3}{8} \times 3\frac{1}{2}$ and $7 \times 5\frac{1}{2}$, about; in each case a trifle larger than our quarter and half plates. It would be a simple matter, assuming that we cut our plates by metrical scale, to increase the area of the *cartes-de-visite* and cabinets to these sizes ($4\frac{3}{8} \times 3\frac{1}{2}$ and $7 \times 5\frac{1}{2}$)—and, in fact, the same in regard to all the others, of which the 100 \times 130, the 120 \times 160, the 180 \times 240, the 210 \times 270, the 240 \times 300, the 300 \times 400, respectively approximate to our 5 \times 4, double quarters, 9 \times 7, 10 \times 8, 12 \times 10, and 15 \times 12. Then our foreign clients could have their requirements supplied at a moment's notice, the photographer at home could try and test Continental novelties as easily as he does English ones, and the innocent abroad in want of a dozen plates could drop into the Turkish or Spanish dealer's for them untroubled by any misgivings as to whether English sizes were kept or not. The loss to international trade through our obstinacy must be vast; the inconvenience to professionals and non-professionals alike enormous. The millimetre would remedy all that. I have an idea that a reformed currency would help bring about a change. America has a decimal coinage; let her go a step further and take the metrical system under her wing, and she will be able to swamp the European markets with photographic goods as easily as patent medicines. Some of us, happily, employ the metrical system habitually—gunmakers, to wit, for barrel bores; accuracy in photographic measurements is just as important. A badly cut plate is a common curse, so is an ill-fitting slide; both faults, I believe, may be traced to over-generous marginal allowances.

In suggesting the substitution of the millimetre for the inch and its fraction, I am in effect advocating a total reformation of present sizes; but this sounds more iconoclastic than it really is. Take a metre measure, place it alongside a two-foot rule, and compare the ten or twelve principal Continental sizes with their near equivalents in inches, and you will see that it merely means in some cases a slight increase, in others a small decrease, in our own sizes. The whole matter is innocent of difficulty, and everybody would benefit by the change. The inch is an inehular—I mean insular—prejudice. Some day, when Sir Edward Watkin has tacked Dover on to Calais, and a tunnel connects Scotland with the Emerald Isle, we shall become to all intents and purposes a bit of Europe; then the metrical system will be forced upon us. We are much in the position of the late Mr. Mahomet; other nations won't adopt our system, so we must adopt theirs if we wish to be in a line with them. By cutting our glass and papers and woodwork to millimetrical scale, we shall have adopted the only philosophical and international system of measurement extant; ensure exactitude, which we rarely get now; save time and make money; and facilitate a better intercourse between antagonistic peoples who, as things look at this moment, are too fond of snarling and quarrelling over much smaller things than even a millimetre. Who knows but that the conversion of this country generally to the metrical system may not be the means of smoothing away the too easily provoked susceptibilities of the Gaul, the Russ, and the Teuton, and of promoting lasting concord between ourselves and our neighbours? I make the Peace Society a Jubilee present of the idea.

I have designedly treated my subject in as light a vein as possible for two reasons: first, because it is possible that the majority of my listeners may be too tired to appreciate a strictly academical treatise; second, because there is no earthly reason why even the heaviest and most dry-as-dust topic should not be approached in an amiable frame of mind.

ELEMENTARY PHOTO-MICROGRAPHY.

By ANDREW PRINGLE.

CIRCUMSTANCES over which I have unfortunately no control cause me to prefix to my title the qualifying adjective "elementary." It may appear to many present that in addressing a meeting on this subject at all I lay myself open to the charge of presumption, for I cannot deny the "soft impeachment" that I am in photo-micrography myself only a tyro, and, in colloquial phrase, a "duffer." But, gentlemen, I have often noticed, and frequently stated, that more is to be learned from the failures of a careful worker than from the brilliant successes of a natural genius, and it seems certain that a man fresh from the difficulties attending any pursuit is more likely to remember the existence, the causes of, and the cure for these troubles than the man who left them behind years ago, just as it is probable that our sons who left school last year are more conversant with the eccentricities and atrocities of the Greek particle than we are who have for years directed more immediate attention to the eccentricities of the share market, and the atrocities of the butcher and the tax-collector. Anyhow, the very briefness of my experience in photo-micrography must serve as my excuse for addressing you on a matter which may be child's play to many of you.

Of the utility of photo-micrography there can be little question, and its utility is not by any means confined to the province of the great achievements of "past masters" in the art. I doubt even if the sphere of greatest utility is to be found in the use of the very highest powers

upon the minutest and most recondite objects. Moreover, however great the experience and talent of the microscopist, his purse must be as long as his practice and as deep as his knowledge if he means to travel into the highest realms of the science whose borders I mean to touch. Be this as it may, I have no present intention of travelling beyond the country I know—that it is to say, the very first and simplest operations for the production of photo-micrographs.

I will begin by pointing out the subjects that suggest themselves to my mind as presenting only slight difficulties, and yet fraught with vast importance to humanity. I do not think I need point out to a body of photographers—nor, indeed, to any body of reasoning beings—the superiority of a photographic delineation of any object whose qualities depend on its reality rather than on its identity to any delineation that can be made by hand, however deft, guided by eye, however acute. Even the most perfect transcript that could be made with the aid of a camera lucida must fall immensely short of a transcript by the unerring and invariable action of light. The finest line that ever was drawn by mortal man is a cable in comparison to the lines that may be produced by photography. Now, the very essence of micrographic delineation is clearness and detail, and I submit to you that for clearness and fineness of detail the photographic print must leave far behind all manual dexterity.

What, then, are the objects to which photo-micrography lends itself with the most conspicuous excellence? Undoubtedly such objects as depend for our knowledge of them on their histology, on their most minute markings, on their varying appearances under various kinds and directions of illumination—as, for example, under reflected, transmitted, direct, oblique, and polarised lights. To scientists studying minute organisms, or minute portions of organisms, the greatest difficulty and yet the most essential point is to examine and get delineations of these objects under varying conditions of lighting, and so to become acquainted with the objects that one object can never be mistaken for another, nor one condition for another. In the first place I will mention physiological and pathological objects—in other words, portions of animal tissue in a normal state, and in a state of disease or abnormality. From experience I can state that many objects of this kind are not difficult to photograph in such a manner that the delineations become of great interest and value for those benefactors of our race—physicians and surgeons. Again, there are many of the lower living organisms whose nature and habits are obscure, though their dimensions are not very minute. There are also vast tribes of diatoms and foraminifera whose nature is as interesting as their appearance is beautiful. The geological formations of our earth form a branch of science of the last importance to man, and the study of them with light direct or polarised is one of never-ending interest and variety. The substances which afford nutrition to our bodies and act as counter-agents to the waste going on constantly in our life, are, for the most part, amenable to microscopic examination, and, what is more to my purpose, to photographic delineation. Lastly, the germs of disease, not only in the animal but in the lifeless organisms so familiar to us, can be, and have been, and shall be, if we are spared, examined, distinguished, and portrayed by microscopic and photographic agency, till their natures, their habits, their transmission, their reproduction, their annihilation, if it please Providence, shall be matters not of mystery confined to the *savant*, but understood by all the people. This, gentlemen, is a noble ambition, and the path to its fulfilment is not a dreary, nor a dark, nor a criminal one; the path is illuminated along its course by gleams of highest interest, by intense satisfaction, by a knowledge that the pursuit is glorious and the end philanthropic. The higher flights of photo-micrographic science are surely arduous, beset with enormous difficulties, but we must remember that, as we progress, the difficulties vanish behind us, and what we now look upon as well-nigh impossible, will, in the future, appear pigmy impediments. The very simple operations I propose to mention to this meeting appeared, not so many years ago, to the mass of photographers, as matter of the greatest uncertainty and difficulty, and only to be fully understood and successfully worked by men who have spent much time in mastering the details of microscopic science.

Having now, at perhaps superfluous length, delivered a sort of apology for photo-micrography, I will proceed to practical matters.

The first thing to decide is what kind of objects we mean to tackle, or more particularly, what extent of amplification we mean to attain. My earnest advice is to “en' cunny”—*Anglicè*, “drive slowly”—at first. Certain failure will follow temerity in this respect. The object for a first trial must be thin, lightly if at all stained; be neither too opaque nor too nearly colourless. The objective should not be a higher power than one inch, while a two or three-inch glass would be preferable. The microscope eye-piece must not be used, as it entails certain difficulties, and in some cases absolute failure.

A word or two about the objective, which is, perhaps, the most important part of the whole apparatus. Microscopic objectives made for ocular examination of objects sometimes have their visual and chemical foci not in exact correspondence; a lens of this uncorrected kind is useless for photography. The fault may be remedied in several ways, but my advice is to get a properly corrected lens at first. It may have been De'il's luck attending me, but it so happened that the two-inch, the one-inch, and the quarter-inch with which I started were all faultless in this respect.

As to the light used. I prefer for simple work a paraffine lamp to other radiants. My start was made with a small cheap lamp of this kind, such as is usually sold with moderate-priced microscopes; my lamp had only a wick of about a quarter of an inch wide, but I recommend a wider wick, say one inch, and that used with its edge turned nearly straight towards the object. A multiplicity of wicks I consider a downright disadvantage; the smaller the area of radiance, commensurate with brightness, the better. I believe an arc electric light to be the best of all, but it is not needed for any such simple work as I am treating of now. An achromatic substage condenser is another valuable aid for advanced work, but for our present purpose an ordinary bull's-eye, called a “stand condenser,” is sufficient. This is placed near the light with its flatter side towards the light.

My own first arrangement of camera, tube, object glass, and stage was very convenient for work with low powers, where searching for the object was a matter of ease. I will describe it in a few words and then pass it, for I found it rather expensive, somewhat awkward at times, useless for really higher-power work, and excelled for any work by an arrangement which I shall afterwards explain, and one that finds favour with the best workers both for easy and difficult work. In my arrangement the microscope tube, with coarse and fine focussing arrangements, screwed into a cone fitted to the camera front, while the stage, with object clips and a rotating diaphragm with apertures, were fixed to the end of the tube by a bayonet joint. By this arrangement the diaphragm, object, objective, and tube were all axially centered on the ground-glass centre. But there was no fixed arrangement for centering and keeping central the light and the condensers, and from that fact arose all my first troubles. In our work one of the first necessities is absolute centralisation of the whole of the apparatus: without this no good can be done. It seems to be impossible to fix all the necessary parts centrally together without involving great difficulty in the operation of finding the object, and the best plan appears to be to divide the entire apparatus into two parts, the components of each part being fixed centrally, and then by means of a “stop” to ensure centralisation of the whole on the longitudinal axis when the two larger divisions are brought together and aligned by means of the stop. The best arrangement I have seen, and it is approved by good authorities, is one whereby the microscope tube, stage, object, condenser, and light are all centered on one baseboard, while the camera runs axially centered along a short slot on a second base. The microscope base is pivoted on a centre, so as to swing laterally, for a purpose which will soon be explained. The object is first staged and found with the microscope in the usual way, the condenser and light centered on the base, carrying microscope, stage, condenser, and light, and then the base carrying all these is swung round to the longitudinal axis of the camera, being arrested there by the fixed stop aforesaid. The camera is now pushed forward along the slot aforesaid, so that the end of the microscope tube projects into the camera and a light-tight junction is formed by means of black velvet or accurate fitting of the parts.

I know quite well that few of you will understand this very miserable description, and I have no means of offering you a drawing, but I propose to ask our good friends the *pressgang* to publish a drawing of the apparatus as made by a well-known London firm, Messrs. James Swift & Son. I believe the design is due to a considerable extent to Dr. Crookshank, who read at the Photographic Society in June last a paper on *The Photography of Bacteria*; to describe that paper as “interesting” would be to “damn it with faint praise.” Dr. Crookshank may consider himself responsible for an attack of temporary insanity, if not permanent bankruptcy, on my part.

We must now devote a moment to the camera. It should be a good strong camera, with a stretch as long as possible, for on the amount of stretch depends, *ceteris paribus*, the amount of amplification. No swings-back of any kind are required; they are, in fact, better absent. The commonest make of wooden camera will answer, provided it will stretch and is strong and light tight. For simple work and small amplification the ground-glass of the camera usually suffices for focussing, but where very fine work is to be done with high powers the ground-glass is too coarse. I have used two surfaces for focussing in such cases, in each case placing the prepared plate in a wet-plate slide, drawing the shutter, removing the back, and focussing on the plate with its prepared side to the front. The first way of preparing a plate for this purpose is to rule a few lines—not scratches—with a diamond in squares on the face of the plate. This gives the very finest surface for very high powers and difficult subjects. A plate intermediate between this and ground-glass is prepared by just fogging a sensitive gelatine plate, developing and fixing it, bleaching if necessary with mercuric chloride. This plan I found in a book—the author's name, I am sorry to say, I forget; it is a capital dodge. In all cases a focussing eye-piece will be required. I use the ordinary focussing ocular used in photography, but I am careful to have it itself carefully focussed by examination of a small speck on a window pane.

I think we are now in a position to suppose ourselves about to make a trial. It is well to arrange for a week's absence from the family circle, pay the household accounts, lay in a good supply of cooling drinks and a few pounds of tobacco, pay an affectionate farewell to the babies and a ditto embrace to the missus; for the new-born photo-micrographer is not much good to anybody till he has cut his first tooth. There is an

irresistible and engrossing fascination in this work that cannot be e-scaped nor ever forgotten. When I began I did not for three weeks get beyond a distance of about fifty yards from my dark room. I was smitten as with a pestilence; a grim mania for new objects to conquer possessed me; I revelled in the very names of tubercles, Graafian vesicles, malignant tumours, sloughing phagedawa, tapeworms, bugs, fleas, lice, and nauseating skin diseases. The horse parasite was of more importance to me than the horse in the stable. My flowers suggested to me only the names of red spiders and aphides. Paring my nails became a polariscope operation. I would have stewed a mouse for a single hair, stormed a bee-hive to get a sting, and I even excoriated myself for a specimen of *tinea versicolor*.

This, however, is not business, though it is truth. Nothing but common-sense and experience can teach us to centre our object on the ground-glass and to focus it. The apparatus I have described ought to explain itself. It is necessary to know in the first place what points of our object we require to bring out particularly. I made several photographs of various objects before I discovered what were the parts that I ought to emphasise. In many cases I had actually to ask what the important part was. If we try to photograph complete objects on anything like a larger scale of amplification, we shall find optical difficulties almost insurmountable at the very outset. Our lens will want "penetration" or "flatness of field," and practice alone will teach us what our lenses will do and what they will not. "Penetration" is the equivalent of what we call "depth of focus;" "flatness of field" corresponds to same extent with our "covering power." The best plan is to begin with some very thin flat object of considerable area and fairly light colour, and to find out to what extent we can enlarge it with a rather low-power lens. We must find out once for all, to save trouble, the amount of our various amplifications. Here is the way to do this. Put a stage micrometer on the stage. The lines are drawn at distances of one-hundredth and one-thousandth of an inch apart on the micrometer. Focus the micrometer lines at the distance we intend to work at and with the lens we intend to use. Then measure the interval from one line to another on the ground-glass, and a simple calculation will tell us our amplification. If on the ground-glass the one-hundredth lines are exactly one inch apart, evidently the amplification is $\times 100$, if quarter of an inch the amplification is $\times 25$, if three inches it is $\times 300$. I made measurements with all my lenses at all my distances, and wrote a list of the results, so that now at a glance I know the extent of my multiplications.

I soon found that sometimes, though I got my objects fairly well represented in my prints, I got poor grey backgrounds. I therefore proceeded to find out by experiment the exposures necessary to give black negative backgrounds when no object was on the stage. These results, too, I tabulated, and they now form a list of minimum exposures for the various lenses and distances. I found the whiter the light the better the background, so I recommend the addition of camphor to the paraffine in the lamp. I hope soon to discard paraffine entirely in favour of the oxy-hydrogen light.

So far as I have found out by perusal of books on photo-micrography, the writers for the most part have been very good microscopists but rather shaky on photography, and so far as I have seen the producers of photo-micrographs of magnificent microscopic qualities have not been fully alive to the necessities of a photo-micrographic negative. What we want is not what we call in photography a good negative. We want for photo-micrographic work a negative that in pure photography would be called "flat." In short, we should sacrifice everything for sharp and full detail. Density in parts is no doubt very pretty, and very artistic, and very agreeable to our notions, but it is out of place in a photo-micrograph. A photo-micrograph is a purely scientific production, there is no fine-art about it, however much people may quibble on the matter; and we must put aside all ideas of balance, symmetry, pictorial composition, and chiaroscuro. What we want is material, not ideal. I spoiled a good many negatives by trying to make pretty pictures and good negatives according to usual acceptance. I am very fond of *Pictorial Effect in Photography* both to read and to practise, but we must ignore Mr. Robinson—forget him we can't—in photo-micrography.

There are two classes of objects which we may have to photograph. Class I., Dense, semi-opaque, highly coloured. These sometimes cannot be photographed really well at all, but the line to follow is to use a rapid plate, ample exposure, and perhaps a tinted light of, say, blue colour. These should be highly developed with small percentage of pyro. Class II., Colourless or very thin but not transparent objects. (There are many objects so clear that they cannot be photographed by direct light at all. I hope to say more of these next year.) For translucent, or thin, lightly coloured objects, we require a white light, shortish exposure, and a slow plate giving contrast, which we may enhance by prolonged development.

Gentlemen, I have succeeded, as you will admit, in speaking a very great deal and saying very little indeed. I think I never saw an effort so successful in this line as my Convention paper. But I assure you I have not un-gessed wilfully; my mind was so full of my subject that, like a London street on a big day, my utterance got blocked. Next year, D.V. and W.P., I hope to address you on this subject in terms no less enthusiastic, but much more specific and useful.

GELATINE EMULSION.

By A. L. HENDERSON.

WHEN I had the honour of reading a short paper at the Convention last year I mentioned the fact, that by the addition of a small quantity of nitrates and bromides to a finished emulsion much greater rapidity and density could be obtained, and that doubtless further experiments would reveal or explain many things that at present are still inexplicable. I promised that I would at some future occasion detail other experiments. I will now endeavour to redeem this promise.

I think I have stated that if an emulsion is set and remelted several times greater speed and a finer quality is the result. My explanation is this, that by the contraction of the gelatine and the subsequent remelting the bromide of silver is broken up and altered in crystalline form. Now I know that it will be argued that, if emulsion is kept at a liquid temperature the same result would follow. I have tried the experiment of keeping half of a batch at about eighty per cent. for ten hours. Setting and remelting the other half four times during the ten hours there was a much greater increase of speed and density in the latter half. Another year's work with the separator corroborates all my previous statements concerning the value of the machine in emulsion making. The full value of the ripening action by the addition of nitrates, &c., to the finished emulsion, can only be gained by a complete elimination of the emulsifying gelatine and biproducts. I do not say that the ripening action will not take place in a washed emulsion, but there is an uncertainty about it. The separator has shown me, that so long as the temperature of emulsion is kept down there need be no danger of fog, especially in the presence of caustics; yet, with a large quantity of carbonate of ammonia, an emulsion may be boiled for a considerable time without any fog appearing.

One of my latest dodges is to make an emulsion with carbonate of ammonia separate, add fresh gelatine, nit. potass, and bromide, and then, to prevent decomposition of the gelatine, by addition of a small quantity of chrome alum. I keep this emulsion liquid at a temperature of 98° to 110° for twenty-four hours; this increases the speed from, say, 16 to 23 on Warnerke's sensitometer. A further prolongation of heat will generally require a fresh addition of chrome alum, when a still higher reading will be obtained; and, what seems very strange, the camera reading will be much higher than the sensitometer one. I have had two emulsions, both giving 16 Warnerke with a rapid shutter; and using a stop f_{27} , I had a fully exposed negative in the one case and the other only a faint indication of an exposure. There is a remarkable ripening action by the addition of fresh gelatine, bromide, nitrate, and alum. The method of breaking up of the bromide of silver was first published by Professor Stebbing, and at the time I tried it I found that the effect was obtainable without the bromide, yet I failed to see any advantage. I will now, as an experiment, show you, that by mixing nitrate of silver and bromide of potassium in water, then washing the precipitates and adding a few grains of gelatine and applying heat, that a remarkable breaking up of the bromide of silver goes on. Of course, as the salts are so perfectly removed an oxidation or alteration of the bromide is likely to take place when heat is applied: the addition of the nitrates, &c., as aforesaid, tends to prevent this. Some of the gentlemen here may not have seen the action of the centrifugal separator. Messrs. Watson, Laidlaw, & Co. have kindly placed one of their newest forms of machine at my service, with which I will give you a demonstration.

HOME PORTRAITURE.

By T. N. ARMSTRONG.

WHEN requested to prepare and read a paper on Home Portraiture, I had considerable doubts as to the desirability of selecting such a subject. At first it occurred to me such could have but little, if any, interest to the majority of our professional brethren. On the other hand, seeing we were to have among us so many amateurs to whom a few practical remarks on what I consider the best means of taking portraits in an ordinary room might be of interest, I deferred to the wishes of those entrusted with our arrangements, and have put together a few remarks which I trust will be acceptable.

It seems to me by far the larger proportion of amateurs give but little attention to home portraiture, nor is it difficult to find the reason, for of this a very general opinion exists that without the aid of a studio, with its special advantages for lighting, &c., an amateur cannot hope to produce results that will in any way compare with professional work. Now I am not one of those who think thus. On the contrary, I maintain and hope to be able to show you that there is no reason why an amateur in many instances should not be able to produce really first-rate specimens of portraiture without the aid of a studio.

At the outset, let me say I consider the proper lighting of the sitter of paramount importance, and here it is an amateur who for the first time attempts to take a portrait in an ordinary room is likely to err. In his eagerness to get as much light as possible, the blinds will be run up, the windows scrupulously cleaned, and everything done to flood the sitter with all available light. This using of too much light is one of the first errors a beginner is sure to fall into. If, for instance, we place a sitter near an ordinary window having a good open view, and expose a plate,

on developing same it will be found that the contrast from light to shade is too great; the side next the window will be found too light, the off side too dark. What is the reason of this? A beginner will very likely imagine and say, "Oh, it's no use trying, I have not enough light." Now, in reality, such is not the case; it is not that there is an insufficiency of light, but that it is not of the proper quality, or, in other words, is not sufficiently diffused.

Now, seeing that diffused light plays such an important part in portraiture, let us briefly consider what is meant by diffused light, and then how best to obtain it.

There are two kinds of diffused light, namely, artificial and natural. The atmosphere being filled with floating particles, all of which being more or less opaque are continually reflecting and absorbing light, those particles that are transparent are constantly refracting and absorbing light, and this constant changing of the course of the rays until they are thrown into every conceivable direction is called natural diffusion. You will readily perceive we have no power of controlling such. But it is not so with artificial diffusion; in portraiture it is a most important factor, and we must bring it to our aid to soften high lights, and break up too strong shadows. But how are we to obtain it? When any translucent screen is made to intercept the direct rays of light, and the atoms of which the screen is composed reflect or refract the rays so that those which come through have lost their general direction, some passing one way, some another, are said to be diffused. This we call artificial diffusion. To obtain such, procure a very thin muslin screen, which place between the window and the sitter, out of range of the lens, in such a manner that all the rays which fall on the face must pass through the gauze. This done, if we expose another plate on our sitter, we will find a very material change has taken place. Not only has the high lights, which were too hard previously, been softened down, so to speak, but the dark side of the face will appear to have been lighted up, thus reducing the violent contrast which previously existed.

Having briefly referred to the necessity of breaking up a too concentrated light, now let us consider the best means of employing a translucent screen so as to throw the light from a proper angle on our sitter.

In making choice of a room for the purpose of taking portraits, choose the one with the tallest windows you can get; the higher the window the better it will enable you to get more top light. If you succeed in getting a room with a high window, begin by blocking out with a brown curtain three feet of the light at the bottom. This is easily done with an ordinary muslin blind run on a stick, and which can be dyed by steeping it in a decoction of coffee. Then, with another very thin white gauze blind, screen off the light to the middle of the window, and then bring into operation your thin white gauze screen, which rests on the top of the bottom sash, slanting inwards at an angle of about forty-five degrees. Now place your sitter as low as possible, and content yourself with taking a head and bust on a light background. This done, you will not only have your light of the proper quality but from the best direction; your high lights will not be too hard, nor your shadows too deep. Bear in mind, however, when lighting your sitter, that the shaded side of the face is often very deceptive; the shadows must appear lighter to the eye when posing than they will be in the resulting print. To enable you to light up the shaded side of the face I know of no better or simpler reflector than the homely clothes-horse, over which is thrown a white sheet. In using a reflector, do not throw the light from behind the cheek, but rather throw the light on the front of the shaded side, allowing the back part of the head to be in the deepest shade.

Let some of you may imagine that this screening of the light will require unduly long exposure, let me here say that, working with an ordinary cabinet portrait lens, my exposures rarely exceed six seconds when using a rapid dry plate. But some of you may say, What about facilities for various styles of lighting? In this we are not even tied down. I have brought with me to-night for your inspection a few examples of my home work, and if you examine them you will find several different styles of lighting. It is wonderful what a variety can be obtained with a little practice, working on the lines I have laid down.

I have spoken first of lighting because, in my opinion, it is the most important of all the many manipulations required in portraiture. Get as much light as you can, but be sure it is of the proper quality; then a little practice will teach the intelligent beginner. It is wonderful how soon he will find out how best to place and light his sitters, so as to obtain proper gradations of high lights, middle tints, and deep shadows. Your chemicals will never give you these if your lighting is wrong; and, beyond everything, do not fall into a practice of under exposing. Great care must be observed in this. The great point and beauty in portraiture is softness; it is got by properly lighting and fully exposing, and in no other way.

Next in importance to lighting comes posing and expression, and here the amateur is not handicapped, but in reality has advantages which his professional brother has not. One advantage which he has, and which is of great importance, is an intimate acquaintance with his sitters; he will most likely know his or her little soft points beforehand, and what little chord to touch and preparation to make so as to put them in the best of humours. I have seen a cup of tea handed to a lady just before sitting work wonders in the way of making her comfortable. Be ever on the watch for even such a trifle as this, and never lose an opportunity of getting your sitter in a natural vein. In posing, the amateur must

study, however, and, above all, do not weary your sitter with manning them about first one way then another. Very likely the first position they will take when sitting down will have something natural about it. Watch for such like a hawk, and if you see they are not going to fall into a natural position, wean them off by drawing their attention to some little triviality, such as letting them walk about a bit, or looking at something pleasing or comical. You are, or should not be tied down for time like many a professional; the proper time to be quick is when you have got a good pose and expression. Then be as quick as a needle in a machine if you like. Expression is of the first importance in portraiture. The best hints I ever obtained on posing and expression I derived from what E. K. Hough wrote, and on this head I cannot do better than quote his own words.

He says:—"We will suppose the sitter to be the centre of a circle with diverging lines, like the hub of a wheel with its radiating spokes; suppose this wheel twenty feet in diameter, and the spokes one foot apart at the periphery. The junction of these spokes with the rim we will call points, like a compass. Now let us place the sitter at the hub, looking straight before him, body, face, and eyes, to the camera, ten feet away, at the outer edge of the circle; this we may call a position of neutrality—impassive, inactive. Now, the body remaining in front, the head and eyes turning to the left or right, if ever so little, there begins to be expressed activity, thought, emotion, in which the eyes play an important part, and a part that may be largely brought under control, else there were no use describing it. To illustrate—If the head be turned two points away from the camera, the body remaining front, the eyes to express an easy, animated, but not deeply interested, attention, should be turned nearly to the third point. When the head turns from the body to the fourth point, the eyes to correspond should turn nearly to the sixth, thus expressing the same kind of easy, natural interest, but more active and more interested; and this corresponding divergence amounts nearly to a definite ratio whether the turning be more or less, being as two to one. Two of the head from the body to one of the eyes from the face, or, in other words, in turning the eyes to an easy point, right or left, the head must naturally turn about two-thirds the distance. This ratio of divergence we will call normal, and we shall find it giving about the kind of expression generally preferred in portraiture. Moreover, we shall see that any deviation from this normal relation immediately begins to express something different, often something not at all desired. For instance, the body remaining front, with the face and eyes both turned full upon the third or sixth point, or any intermediate point, there would immediately begin to appear an absorbed, deeply interested gaze expressing anxiety, surprise, or other emotion, according to the rest of the face and action; while should the face remain fronting, with the body directly toward the camera, when the eyes turned two or three points away there would immediately appear an uneasy, insincere, jealous, watching expression, not at all pleasant.

"Varying the illustrations by placing the body fronting the third point away from the camera, while the face is turned to the first point, and the eyes into the camera, you will have an easy, direct, sincere, manly attention, while if you place the head and body both pointing to point three, when the eyes are full on the camera you will obtain at once shyness, coquetry, suspicion, or other similar expressions according to the other facial action; then if you point the body on three, while the face and eyes both turn full on the camera, there would begin to appear a bold, domineering, look-you-out-of-countenance sort of expression, or other similar undesirable effects.

"The same principle holds good in looking upwards; for instance, the head slightly raised with the eyes about half as much more may express spiritual contemplation, adoration, supplication, &c., according to the accompaniments, while the face remaining level or slightly drooped with the eyes still turned upward, looking, as they must, somewhat from under the eyebrows, will express a cowardly shrinking, a sinister watching, or suppressed anger, according to the other features."

These hints might be greatly elaborated, but the intelligent beginner will place his camera before the sitter and multiply these illustrations to any extent. The main thing to thoroughly understand is, that in every modification and turn of position these relations of the eyes to the face will express something, and if not controlled to express what is desired may give an expression quite undesirable.

Having briefly glanced at lighting, posing, and expression, let me next say something about the needful apparatus. A beginner will very likely attempt this class of work with his ordinary landscape camera and symmetrical lens, with the result that somehow or other they do not produce pictures that can at all compare with professional work, and very likely they will throw it up in disgust. Experience has taught me that home portraiture requires close study and the employment of accessories which, in nine cases out of ten, an amateur does not possess. First, as to the camera. If you are going to confine yourself to simple heads relieved on a white background like some of the examples I have brought with me to-night, your ordinary landscape camera will suffice; but if you aim at more pretentious work, then a studio camera with its side and top and bottom screws is a necessity so as to get the sensitive plate on the same plane as the position of your sitter. Then, again, the camera stand. Very few amateurs are possessed of other than an ordinary tripod which is no use for indoor portraiture. A good, steady, firm stand, capable of raising and lowering the camera rapidly is another necessity.

Then as to the lens. I find a very prevalent opinion exists that any sort of a lens will do. Some one has said, I forget who, that any hammer will drive a nail, and any lens will take a picture; but no lens will do all classes of work any more than one hammer will. In portraiture a good portraiture combination is a *sine qua non*.

Another matter which may seem of small importance to many is the cap of the lens not fitting properly. When I say not fitting properly, I do not mean too loosely on the hood, but just the right thing; if too tightly vibration is likely to ensue when removing it. Even such little matters as these are of importance. I know from experience how necessary it is to guard against such, for when I acquired a high-priced portrait combination from one of our best English makers, the cap fitted so tightly that it was impossible to remove it without shaking the camera, and many a plate I spoiled through it. The sitter was blamed of course.

Head-rests I never use. I have one, but it is a nuisance. When I get a sitter who cannot keep steady for a few seconds, I adopt some pose whereby a natural rest comes into play.

Get a good background by all means. I prefer what is called empire-cloth stretched on a frame, one side light for vignetted heads, the other side a dark slate colour, and on the top I have two rods nailed, which can carry curtains at either side. I find these curtains very handy, they can be used or not at will.

Hitherto I have said nothing about developments; this, at first, will give a beginner some trouble. The chief point is to obtain proper density. Your negatives must not be too thin nor yet too dense, but just the right thing. It would never do to develop a white satin dress with as much pyro as a dark glen. Experience soon teaches a thoughtful operator. I would strongly recommend beginners to stick to one brand of plates, and let these be as rapid as possible, then practice will teach you how to mix your developer so as to get proper printing vigour in your negatives. I never intensify. Should you happen to over expose and so get your plate too thin, I know of no better way of gaining density than that recommended by the Paget Company—I mean their citrate of ammonia formula. By its use, when all detail is out, development is stopped, but the image already formed is allowed to grow stronger.

And now I come to that much-maligned operation of retouching. I do not care what may be the opinion of those opposed to the use of the pencil, I fearlessly assert that retouching is the professional sheet-anchor in this branch of photography, and I should like to see the studio that could be conducted without its staff of retouchers. Until I took lessons and became proficient in retouching, I was quite cognisant, and so were my friends, that my attempts at portraiture were miserable failures; the moment I understood how to retouch and model my negatives that moment I felt I had entered into a new sphere in photography, and then I saw for the first time I had mastered portraiture.

Not only do I advocate retouching, but I recommend the use of every dodge under the sun to improve not only the negative, but also the appearance of the sitter when going to be photographed. I remember once being told by an amateur who had a very exalted idea of his own art culture, on looking at one of my pictures—it was that of a lady friend who had a very pretty face—after examining it and confessing it was very nice but retouched to death, he thought.

"Do you think so," I replied.

"Yes," he answered. "You retouch too much, Arnström, I think."

Thereupon I went to my cupboard and produced the negative. "Show me the retouching." He stood amazed, and confessed he would not have believed it! I told him he had something to learn yet.

In this case I had taken the liberty of freely using the puff and powder pot, of doing up the eyes and eyebrows, even going so far as to paint the lips quite in the professional-beauty style; and who shall say my picture was not like the original when she sat down? I often hear it argued that retouching kills the likeness and spoils the texture of the picture; all I can say is, a good retoucher will do nothing of the kind, but, on the contrary, will remove those imperfections in the negative which is necessary to the yielding of a pleasing and faithful likeness.

I am not here to-night to tell my amateur friends how to retouch, but merely to say that it is my humble but honest opinion to be an absolute necessity if you care to turn out pictures which are to be acceptable to your friends and a credit to yourself. Not only do I advocate retouching, but I go further, and say, adopt every means, such as the employment of ground-glass varnish, mineral paper, &c., for the improvement of your negatives and leave no stone unturned to produce results that are pleasing and life-like.

Lastly, as to finishing and mounting. Exercise your own taste in this respect; if you have a leaning to and are fond of enamelled pictures, enamel by all means. Very likely the most of your friends will say how beautifully finished, while on the other hand you will occasionally meet with some kind friend who will consider your labour in vain, likening your enamel to his patent leather boots. Taste differs in this respect, and perhaps it is well it is so. I prefer to mount my pictures in optical contact with glass, and to enclose them in the good old cases which were all the rage in the grand old collodion days. We seldom see these cases now; but I have brought a few of them with me to-night just for "auld lang syne." Then, again, there are the metal rims; another very nice way of finishing a picture. These rims are not expensive, and if it is desired to hang up a picture they are the very thing. To an amateur they have their advantages, for when presenting your friend with his

picture, as a rule, he has not the cheek to ask for a dozen, as is often the case when mounted on cards. You can with truth say I do not mount on cards, but if you want a dozen or so, here's the negative, get a professional printer to print them.

The mounting of the prints in optical contact is very easily done, if gone about properly. In 1886 the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY asked me to contribute something to his yearly ALMANAC, and I sent him a short article on *Optical Contact*, which you will find on page 118 for that year. If you follow out the instructions I give you will find it an easy matter to mount your prints in optical contact.

And now, ladies and gentlemen, I have finished my task. Much more could be written about this fascinating branch of photography, but I have already exceeded the time allowed. I have told you plainly what little I know and what I believe to be necessary to success. If what I have communicated should in the smallest degree be the means of assisting any of my amateur friends to overcome their difficulties, I shall be satisfied, while, on the other hand, if you deem me a bore, give me a back seat at next Convention.

ORTHOCHROMATIC PHOTOGRAPHY.

By C. H. BOTHAMLEY, F.I.C., F.C.S.

(Abstract.)

THE subject of orthochromatic photography has latterly attracted considerable attention, and has become of so much importance that it seemed probable that a *résumé* of the results which have so far been obtained might not be without interest to the Convention. It is well known that ordinary photographic pictures have not true "values," that is, do not represent the various coloured objects with their proper degrees of relative brightness. Yellow, orange, and green objects, which are bright to the eye, are almost black in a photograph; whilst blue, purple, and violet objects, which are comparatively dark to the eye, are practically white in a photograph. The explanation lies in the fact that ordinary photographic plates are very sensitive to blue and violet rays, but are only very slightly affected by green, yellow, and orange rays; whilst the eye is most sensitive to yellow, orange, and green, and is only very slightly sensitive to blue, violet, and red. In order to obtain pictures with true "values," it is therefore necessary to alter the character of the plate in such a way that its sensitiveness to blue and violet is very much diminished, whilst its sensitiveness to yellow, orange, and green is very much increased.

In 1873, Vogel discovered that the addition of certain dyes to collodion plates makes them very sensitive to orange, yellow, and green, and his results were confirmed by other observers. In 1882-3, Taifer & Clayton took out a patent in France and England for the application of eosine in conjunction with an alkali to gelatine plates, the word eosine being used inclusively. Dr. Eder, of Vienna, has investigated the effect of a very large number of dyes on gelatine plates, the dyed plates being exposed to the solar spectrum. He found that several dyes slightly diminished the sensitiveness of the plates to blue and violet, whilst they increase this sensitiveness to green, yellow, or orange, in a marked degree. Only comparatively few dyes, however, exert any useful sensitising effect. Eosine and its allies and cyanin were found to give the best results.

The author has repeated Eder's experiments with the eosine dyes and cyanin, using the spectrum of burning magnesium instead of the solar spectrum.* His results confirm generally those of Eder, but he finds that a much greater sensitiveness to yellow, &c., can be conferred upon the plates than was observed in any of Eder's published experiments. Plates treated with an aqueous solution of erythrosine or an ammoniacal solution of rose Bengal are about half as sensitive again to the yellow as to any other part of the spectrum, whilst plates treated with an ammoniacal solution of erythrosine are about two and a half times as sensitive to yellow as to any other spectral region.

There are two methods of adding the dye to the gelatino-bromide. In one the dye is added to the melted emulsion, or to the solutions before precipitating; in the other, the dried plates are steeped in an aqueous or ammoniacal solution of the dye. There is, at present, a large preponderance of evidence in favour of the latter, or "bath" process, so far as regards the rapidity and orthochromatic effect of the plates.

The particular dye to be used depends on the nature of the effect desired, since different dyes confer a maximum sensitiveness for different rays. The following list may be useful:—Chrysaniline for green, eosine for yellowish green, erythrosine or rose Bengal for yellow, cyanin for orange and orange-red, coerulein S. for red. For general purposes erythrosine, which is closely related to eosine, is the best, since it confers a maximum sensitiveness for yellow, together with considerable sensitiveness for orange and green, especially if used in ammoniacal solution. Of the many varieties which are in the market the author recommends either the "Erythrosine extra" of Meister, Lucius, & Bruning, or the "Erythrosine I" of the Badische Anilin und Soda-Fabrik. The method recommended for preparing the plates differs but slightly from that of Mallmann and Scolik, or Eder. The plates employed should be of medium rapidity, since highly sensitive plates are so near the fogging point that the treatment with ammonia and the dye is very liable to carry them past this point. Paget Prize Plates XXX, or Wratten's Ordinary answer very

* For details see the *Journal of the Society of Chemical Industry*, June, 1887, pages 423-433.

well. The plates are carefully dusted with a camel-hair brush and are then soaked for about two minutes in a one per cent. solution of ammonia, drained for a few seconds, and then immersed for about two minutes in the following bath:—

Erythrosine solution (1 : 1000)	1 part.
Ammonia (1 : 10)	1 "
Water	8 parts.

The dish is rooked now and again to promote uniform staining, and the plates are drained with their lower edges on blotting-paper and dried in complete darkness. They will keep for several weeks, but the rapidity falls off somewhat. The above formula will serve for dyes other than erythrosine. Stock solutions of the dyes (1 : 1000) are kept ready prepared; they are made with sufficient accuracy by dissolving five grains of the dye in ten ounces of water.

All operations connected with the preparation and development of the plates should be conducted in as weak a light as possible. Yellow light may be used if extreme care is taken to keep the plates covered up, but it is better to use ruby light, such as is given by a candle behind one thickness of ruby glass or paper. Exposed plates are best developed by means of alkaline pyro tolerably well restrained. All the other operations are conducted in the usual way.

Although the application of the dye increases the sensitiveness to yellow, &c., the sensitiveness to blue and violet remains much too great, and in order to obtain correct gradations it is necessary to diminish the intensity of the blue and violet rays by interposing a transparent yellow screen between the object and the lens, or between the lens and the plate. The depth of tint of the screen determines the proportion of blue and violet which is cut off, and hence determines the relative prominence given to yellow, orange, &c. By properly selecting the depth of screen to suit the subject and the result desired, the photographer is able to exercise very considerable control over the character of his picture. The best form of screen consists of a film of dyed collodion, gummed to the diaphragms of the lens. A yellow dye, such as Manchester yellow, or aurantia, is dissolved in enamel collodion to the required depth of tint, and the collodion is poured on a carefully polished glass plate. When dry the collodion is stripped from the plate and cut into pieces of suitable size. A plate of yellow glass, or of ordinary glass coated with dyed collodion or gelatine, may also be used, and is best cut in the form of a circle and placed inside the hood of the lens—a position in which it does not interfere with the use of cap or shutter. It is essential that the faces of the glass screen be as perfectly parallel as possible, in order that the definition of the lens may not be interfered with.

Treatment with the ammoniacal dye solution increases the rapidity of the plates about three times, but the yellow screen cuts off nearly all the blue and violet, and hence the use of the screen increases the exposure required to twice, thrice, or even ten times that of the undyed plates without a screen, the time depending on the depth of tint of the screen.

In order to illustrate the character of the results obtainable, the author exhibited several sets of photographs of various coloured objects taken (1), on an ordinary plate without any screen; (2), on a dyed plate without any screen; (3), on a dyed plate with a yellow screen. The time of exposure was the same in all three cases, and since the plates exposed without a screen were very much over exposed every chance was given for the yellow, orange, &c., to register themselves on the plates. Undyed plates exposed for the same length of time behind a yellow screen gave no trace of a developable image. Each plate was developed with a view to obtain the best possible rendering of the yellows, greens, &c. The examples shown included photographs of a seat of coloured paper, chromo-lithographs, flowers, pottery, and landscapes. The "values" of the pictures taken on dyed plates with a yellow screen are very satisfactory and are an immense improvement on those taken in the ordinary way. In the case of the flowers and pottery the differences were very marked indeed. When the dyed plates are exposed without any screen the rendering of yellow, green, and orange is very much improved, but blue and violet are far too light. It is only when the yellow screen is used that the values become correct. Care is necessary, however, to avoid cutting off too much of the blue and violet, and thus making the gradations incorrect in the opposite direction. In landscapes the improvement was much greater than was anticipated. It is most marked in the rendering of masses of foliage and of the different shades of green. Moreover, the yellow screen cuts off the greater part of the blue atmospheric haze and thus gives clearer distances.

Many points of detail require further investigation, but it may safely be said that orthochromatic methods place great additional powers in the hands of the photographer and constitute a very great advance in both scientific and artistic photography.

CAREY LEA'S PHOTOCHLORIDE OF SILVER.

By WILLIAM LANG, JUN.

THE alchemists of old had their philosophers' stone and elixir of life, and many, indeed, were the attempts made by those early pioneers of chemical science to wrest from nature what they considered would be of untold benefit to mankind. I take it, gentlemen, that if anything in our art is, or can be considered as analogous to the philosophers' stone of the alchemist, we will find it in that branch of photography which has

received the name of heliochromy. Photography in natural colours would indeed be a grand achievement, but the question is, Are we any nearer its accomplishment than we were in 1848, when Becquerel laid before the French Academy of Science his silver plate imprinted with the colours of the spectrum. I think, gentlemen, the position of affairs at the moment is this, if silver chloride is to be the medium by which a transcript of the colours as we see them in nature is to be arrived at, we should very soon now be able to say definitely whether the thing be a possibility or not. As you are aware, there have been many workers in this field. It will be sufficient to recall to you the names of Nièpce de St. Victor and of Poitevin, of Herschel, Hunt, and Abney. Becquerel's work we have already alluded to. One would have thought that by this time all the changes that were possible had been rung as far as production of colour from silver chloride was concerned, but that such is not the case is remarkably evident from the contribution to photographic science that has lately been made by Carey Lea. In the May number of the *American Journal of Science*, the first of a series of papers made its appearance, having for its title, *On Red and Purple Chloride, Bromide, and Iodide of Silver; on Heliochromy, and on the Latent Photographic Image*, and it is some of the facts brought forward by the American experimentalist, not only in the May, but also in the June number of the *American Journal of Science*, that we purpose laying before the members of the Convention this evening. Carey Lea's memoirs are so full of suggestive material that in a communication such as the present one or two points can only be touched upon. Those interested in the chemistry of photography will recognise at once the importance of the researches that have here been carried out. The whole contribution is remarkable for its originality, and it takes its place at once in the first rank of the many classical researches which from time to time have enriched photographic science. Carey Lea's views regarding the latent image may or may not be ultimately accepted by those competent to form an opinion, but the fact remains that his experiments will form the starting point for further investigations. It is no small matter for the experimentalist to be able to produce in the laboratory and in quantity that coloured form of silver chloride which hitherto has only been obtained, and that in what might be termed infinitesimal quantity, on the surface of silver chloride by the agency of light. To the coloured substance thus produced, Carey Lea has given the name of photochloride, and specimens I beg herewith to put forward for your inspection. It is worthy of notice that this photochloride can be obtained by a great number of methods. For these we must refer those interested to the original paper. It will be sufficient for the present to indicate that particular process by which the specimens now before you have been obtained. Freshly precipitated silver chloride after washing was dissolved in ammonia, and to this a solution of ferrous sulphate was added, producing an intensely black precipitate. Dilute sulphuric was afterwards added till a slightly acid reaction was manifest. Thereafter the precipitate was well washed by decantation and boiled with dilute nitric acid, washing was again resorted to, and the product treated with hydrochloric acid dilute, boiled, and finally washed. I show specimens of the substance both in the moist and dry state. I have also prepared the corresponding photo-salts obtained from the bromide and iodide of silver, thinking that they would not be without interest, and here are the specimens of photoiodide and photobromide in question. Their mode of preparation is somewhat similar to the method employed in the case of photochloride, but, here again, we must refer members for particulars to the original communication reproduced in our own two leading photographic journals.

To come back to the consideration of the photochloride, the question naturally arises, What is it? Its discoverer describes it as a combination of silver chloride with its own subsalt, but one extraordinary thing connected with it is that no two specimens, although to all intents and purposes prepared in the same way, show the same percentage of subchloride to that of the normal chloride. The amount of the former substance, combined with the latter, seems to vary from half per cent. to something like nine per cent. To quote Carey Lea's own words—"Even when silver chloride, bromide, or iodide contains as little as one-half of one per cent. of subsalt combined, its properties are greatly changed. It has a strong colouration, and its behaviour to light is altered. Even a much less quantity, one inappreciable to analysis, is capable of affecting both the colour and the behaviour to light."

It seems to me that much experimental work will have to be done before a clue to these variations will be satisfactorily obtained. To enumerate all the reactions of this phenomenal compound would simply weary you; one striking characteristic may perhaps be alluded to, and that is its being able to resist for a considerable lengthened period the action of boiling aqua regia. Referring to the colours assumed by this protean substance, Carey Lea specifies that it "shows all the warm shades from white to black through the following gradations: white, pale flesh colour, pale pink, rose colour, copper colour, red-purple, dark chocolate, black."

Another point that will require elucidation before the complete identity of the chloride, coloured by the agency of light, and the photochloride produced in the laboratory be established, and that is, Is oxygen present in the latter substance? Carey Lea says nothing in his memoir that would indicate the presence of oxygen. Dr. Hodgkinson's experiments demonstrate what other experimentalists previously had inferred, that in coloured chloride, produced by light, oxygen is invariably present. I feel

sure we will not have long to wait before an answer will be given to the question here raised.

I think it would be doing Carey Lea great injustice were I not to allude to a discovery he has made, and which is embodied in his memoir, namely, that he is able so to affect a film containing a silver haloid by application of a chemical reagent, that he can produce a result equivalent to the latent image formed by the agency of light. The body which gives this result in the most pronounced manner is sodium hypophosphite. It virtually, according to Carey Lea, converts the haloid into a photo-compound, producing no visible change, but when a developing agent is applied the action is rendered manifest.

At the conclusion of the article which appeared in the May number of the American journal already referred to, we find Carey Lea making use of the following language:—"I am persuaded that in the reactions which have been here described lies the future of heliochromy, and that in some form or other this beautiful red chloride is destined to lead eventually to the reproduction of natural colours." Now, gentlemen, does this language seem too extravagant? For my own part I do not think so. The impossibilities of one age become the veriest possibilities of the next. I do not think that even were we able to depict the colours of nature on the photographic tablet that that accomplishment would transcend in value the fact that we are able now in the merest fraction of a second to record the most rapidly moving object that can be presented to our cameras. At the commencement of my paper I drew, as it were, a parallel between the alchemist of the past and the photographer of the present, permit me to continue it, and should it ultimately be found that a research, such as Carey Lea's, does not lead up to the philosophers' stone of the photographer, does not render possible the reproduction of the colours of nature, still the work he has done will be of lasting value to those interested in the chemistry of the silver haloids. Brewster, many years ago in his letters on Natural Magic, wrote as follows, and I think that what he then said regarding alchemy will show that what after all may turn out to be a dream is not without its beneficial result:—"Though the philosophers' stone has not been found, chemistry has derived rich accessions from its search; though the general solvent has not been obtained, yet the diamond and the gems have surrendered to science their adamantine strength, and though the elixir of life has never been distilled, yet other substances have soothed 'the ills that flesh is heir to,' and prolonged in no slight degree the average term of our existence."

Friday's proceedings were rather brief, on account of the dinner, which was fixed for nine o'clock.

The papers read were:—

MODERN FILM PHOTOGRAPHY.

By BUCHANAN WOLLASTON.

In introducing the subject of modern film photography to the notice of the members of Convention, I do so with some diffidence, for I see many gentlemen in the room—old masters of our art-science—to whom any remarks of a poor "junior" in the profession like myself must appear mere foolishness. To them I offer my apologies, in the hope that they will, for the sake of those not yet having attained their majority, bear with me a short space of time in my endeavours to educate the more inexperienced of the brethren; and if, perchance, I may lead some of the "old birds" to a study of this most fascinating branch of the art, it will of course be the more gratifying to me.

It will be my aim in this paper to avoid empiricism on the one hand, as leading simply to photographic quackery, and, on the other hand, I do not wish to pose as a dogmatist, because however much I may know—or think I know—about gelatino-bromide films, there will be those coming after me who are sure to know more, and the greater the number of workers and experimenters the more chance of arriving at the nearest approach to perfection allowed to us mortals to attain to.

I do not propose to tire you, gentlemen, with a history of film photography from its first inception, for to the student it is a matter of but little difficulty to arrive at all necessary facts in connection therewith, and I take it that most of us, more especially on such an occasion as this great gathering, would feel inclined to say, "Let us to business," or "D——n the theory!"

It has been said that film negatives will never become popular with the professional landscapist, but I submit that this is only partly true. There are those gentlemen who will not look into the merits of any new invention—"It is too much trouble," say they, "and we don't want anything better than what we have got." Possibly they may have a nice dogcart in which to convey their *impedimenta*, or a muscular operator who has to bear the burden of the paraphernalia, while the "guy'nor" pockets the results of his exertions. Others say their printer would spoil every negative in no time, and so on.

There are, however, a large section of the photographic community whose pride is to do the best work, without assistance, or with as little as may be, and it is to such men that the advantages of film photography specially appeal, as well as to the amateur.

The advantages are briefly as follows:—1. Portability. 2. Freedom from breakage. 3. Absence of halation. 4. Ease of manipulation. 5. Suitability for carbon printing, and the various photo-mechanical processes involving a reversed image.

No. 1. Portability may be elaborated into:—(a), Storage space: 250 film negatives occupy a space, under slight pressure, of a little more than one inch. A similar number of glass negatives, of average thickness, take up about two feet four inches. (b), Weight: Two whole-plate glass negatives taken at random from a box within six feet of me while I write, weigh fourteen and three-quarter ounces, *nearly*, while two films of same size, also taken at random from an envelope upon the table, weigh exactly five and a half drachms, *avoirdupois*, or stated in grains 6452 apothecary, as against 151.5 apothecary = 42.7 times as much, approximately. Surely this is of great importance to those who place their printing out, to the traveller, tourist, or outdoor operator.

No. 2. Freedom from breakage. What an immense number of valuable negatives are smashed annually, either by "Slipping through my fingers, sir," or in the pressure frames! With films we enjoy complete immunity from these dangers. Further, our negatives may be readily cut with scissors or with a cutting glass to any desired size and shape, without the risk inseparable from the use of the diamond even by skilled hands.

No. 3. Freedom from halation. This is, perhaps, one of the greatest advantages possessed by films *versus* glass, and to those who are engaged in the taking pictures of interiors will it specially commend itself. I have already shown negatives before the Photographic Society of Great Britain in which the delicate tracery of windows and the finest twigs of trees are depicted with almost microscopical sharpness, and these under very prolonged exposure. A slight blurring is noticeable in some instances, which I attribute entirely to diffused light in the camera, not to halation proper.

No. 4. Ease of manipulation. It has been said to me by many of my pupils in photography *before* commencing a set of lessons, "No, I don't think I will go in for paper negatives (or film), it seems so difficult." Now, I have made it my study to find out how this prevalent notion of *difficulty* has arisen, and the result of my investigations lead me to the conviction that in almost every instance either the gentlemen themselves, or some amateur tyro whom they know, has attempted paper or film negatives, vainly imagining that they would behave exactly like glass dry plates. To them I say: "Between film photography and glass dry plate photography there is almost as much difference as between dry plate and wet collodion work, and you must unlearn a good deal of one before you will succeed with the other." It is, then, quite wonderful how the *difficulty* notion slowly but surely gives way before the charm of developing a whole spool of twenty-four exposures in one, two, or three batches, in little more solution than would suffice for three dry plates, and before many days my pupils are led to make such remarks as the following: "Why, the whole thing is as easy as toning a lot of prints;" or, "I can't think why So-and-so made such a mess of his negatives!" There are, of course, those whose "fingers are all thumbs," or who lack common-sense. They had better confine themselves to spoiling dry plate negatives rather than bring discredit upon one of the most beautiful processes of our times by their bungling.

The operation of squeegeeing upon collodionised glass, stripping by means of hot water, attaching the permanent skin, &c., are so entirely new to the average worker that they favour the idea of difficulty, and when one or two negatives only have to be finished, the preparations necessary may be somewhat out of proportion to the advantages, but in making, say, one or two dozen negatives in a batch, the operations subsequent upon development become so methodical and mechanical, and are performed with such regularity and precision, as to make one wonder wherein lies the difficulty so often complained of.

No. 5. Suitability for processes involving a reversed image. Film negatives being printable from either side, it is sufficiently obvious that they are eminently well suited to the requirements of the photo-mechanical printer, the carbon printer (by single transfer), and the collytist; and as there is but little difficulty in obtaining absolute opacity in bright light with as perfect clearness of shadows as possible, I fancy that engineers, topographers, and others, will ere long open their eyes to this new power placed in their hands. How delightful to have a film negative of large size (say 40 × 36), or a set of such negatives, stored on wooden rollers, ready when required to be used for the reproduction, by any process, of an unlimited number of copies of an original, either right or reversed. Ye manufacturers of films look to this! There are many other advantages which have been mentioned from time to time by various writers to the photographic papers, such as greater rapidity of a given emulsion spread upon paper rather than glass; cost, not forgetting the non-requirement of extraneous assistance, decreased postage and carriage, and non-breakage; the possibility of taking a second exposure of any subject, when at a distance from home and doubtful as to exposure, &c., without running short of plates, thereby saving time, temper, and trouble; the absence of dust on finished pictures, when used on spool in a roller slide; the facility of changing spools where no dark room is available, at the sacrifice of one or two exposures only, and so forth.

I now pass on to the manipulation of the films, prefacing my remarks by observing that, although excellent pictures have been, and are still, and will be, produced on films cut to standard sizes in ordinary dark slides, and prepared by many different methods of manufacture, some very ingeniously held "taut" by mechanical holders, others kept flat by means of an adhesive material, the real utility of, and the greatest advantage arising from, film photography can only be truly appreciated

by the possessor of a roller slide of some design, charged with a spool of sensitive material of sufficient length for twenty-four, forty-eight, or more exposures, to be subsequently cut into the required sizes for development.

Be the roller slide of what make it may, and the film, whether permanently attached to a paper backing for rendering translucent by oil, vasline, or varnish, after drying, or a "stripper," or any film capable of being made in length, there are certain rules to be followed and certain snares to be avoided which it will be my object to briefly notice.

The method of inserting the spools in whatever form of roller slide the practitioner selects is a matter in which the inventor of that particular slide is likely to be the best instructor, but let me caution the beginner to be careful not to finger the spool of paper more than necessary, and to see that the first exposure is strained *flat*—i.e., without diagonal creases, which I have known follow through a whole spool, and either spool or considerably mar every picture thereon.

In my own practice I have found films, *ceteris paribus*, more rapid than glass plates, but upon this point I have met with the most conflicting evidence, some experimenters positively asserting that they are slow, others that they are *much* more rapid than any other form of gelatino-bromide. Now, my impression is that with a given emulsion rapidity is favoured by spreading it upon paper, for three reasons:—(1), That in drying emulsion upon paper no crushing of particles takes place on the lower strata; (2), that no blurring of light into shadow takes place; and, (3), that the developer, attacking the light affected parts on *both sides*, brings about a more complete reduction of the haloids. But a great secret lies in development, and I shall endeavour to show you how this can be accomplished with success.

Two golden rules: Do not over expose. Push the development further than *seems* necessary.

Without troubling you with experimental formulæ, I will give you at once the developer I now use and swear by, but if any member will show me a better I will abandon my pet at once upon conviction. My formula stand thus:—

No. 1.

Sodic sulphite, *pure* 8 ounces.
Hot distilled water 40 " (fluid).

Let cool to 60° Fahr., and render *just* acid with citric. Test with litmus. Pour on to 1 ounce (437½ grains) pyro.

No. 2.

Sodic carbonate, *pure* 4 ounces.
Potassic " *pure* 1 ounce.
Distilled water 40 ounces (fluid).

Mix equal parts No. 1 and No. 2 for normal exposures.

Always have a ten per cent. solution of bromide at hand for emergencies, and use if great opacity is desired, but as a rule no restrainer seems necessary.

It is sometimes desirable to proceed with caution, and add a portion only of the No. 2 solution at the outset, and when time is not of much importance I prefer further to dilute the mixed developer with one-third to one-half its bulk of water.

With the above developer and plenty of time—always given a reasonable amount of brains, as Colonel Stuart Wortley once remarked—uniformly excellent negatives can be produced with almost absolute certainty, and upon any of the leading films now in the market; but I must frankly admit that I have seen negatives produced by one of our much-respected members with an ammonia developer fully equal in quality and pluck to the best by my method, but then it is the man, not the developer. In my hands ammonia falls far short of the fixed alkalies in uniformity of results.

It is not within the scope of this paper to give detailed instruction in finishing either paper or film negatives, nor is it my intention to recommend any particular brand, or special roller slide, but I will tell any member who wishes to know—quite privately of course—where lies my love. And if my remarks may induce any gentleman to try filmography and he gets into difficulties, let him write to me and I will try and help him over the stile.

PICTURE MAKING.

By DAVID PRATT.

Much that is written on this subject is without value to the inquiring amateur, because, while it goes round about it, it seldom touches to give practical guidance.

This comes from a general impression that a born artist *only* knows what elements make a picture, and he who is *not* thus naturally gifted will only make a picture by chance. It is true that artistic intuition is the power in picture making, and he who is *so* gifted when viewing nature selects by that inborn power what pleases himself and gives pleasure to others. In other words, he is a *poet*, and when he gives expression he strikes a chord wherever the poetic exists.

This is *accepted*; but it is not generally admitted that there are also laws in picture making that may be defined, and the disregard of which makes a pleasurable picture impossible.

We are told that the old masters had a code of laws which got *buried* with them, but their *works* remain to *prove* the laws they recognised.

These laws existed before them, and *do exist now*, superior to our constituted appreciation of them.

These regulate picture making in each of its branches—landscape, sea piece, figures in landscape, figures, colour.

If the mention of a few of these laws will start inquiry this short paper will not be in vain. 1. The chief object away from the centre. 2. The greatest light against the greatest dark, or the reverse. 3. One-third light and two-thirds dark, or the reverse. 4. The odd set of chords, three or five. 5. If three chords of light or shade be adopted, the one should not be equal to the other. 6. The unequal line or curve of beauty. 7. The odd number of figures. 8. One prominent harmony of colour, or contrast in light and shade.

Let these suffice for the present purpose. A successful picture *may* be made by the intuitive power *although* these laws have not been acknowledged, but we maintain *fewer* mistakes will be made by a full recognition of them.

While chemical and mechanical manipulation is making great strides, and we are seeing beautiful workmanship on every hand by the discovery and recognition of laws regulating these sciences, it only becomes us to formulate the laws of picture making by a careful study of them.

THE CONVENTION DINNER.

After the close of the last General Meeting, on Friday night, about fifty of the members met at the "Bath" Hotel to partake of an excellent dinner. After the removal of the cloth the following programme was gone through:—

Toast: The Queen, by John Stuart.

Song: "Tom Bowling," by Andrew Pringle.

Toast: The Amateurs. Proposed by Jno. Henderson, of Perth, and acknowledged by P. Falconer (President Glasgow Amateur Association).

Recitation: "A Scotch Story," by Jaa. Davie.

Toast: The Professionals. Proposed by J. Traill Taylor; acknowledged by W. H. Prestwich, of London, John Fergus, of Largs, and — Moran, of Glasgow.

Toast: The Convention. Proposed by W. Lang, jun.; acknowledged by Jerome Harrison, of Birmingham.

Song: "Since we were Boys together," by T. N. Armstrong.

Recitation: "The Braw Hielan' Bagpipes," by J. Henderson.

Toast: Photographic Societies. Proposed by Jno. Stuart; acknowledged by Prof. Herschel.

Song: "Jack's come Home to-day," by Geo. Mason.

Song: "The Drygate Brigg," by A. Bowman.

Recitation: "The Bell and the Ivy," by S. D. McKellen.

Song: "The Lowland Bonnet," by Andrew Pringle.

Recitation: Burns' poem "The Louse," by Jno. Urie.

Song: "The Braw, Braw Clerk in the Offish," by — Reid.

Concluding with "God save the Queen," and "Auld Lang Syne," sung hand-in-hand by the whole company in true Scottish fashion.

It would be almost vain to hope to give any of our readers—except those who were present—an adequate idea of the good-fellowship and joviality which prevailed. Suffice it to say that Mr. Pringle's "Bonnet" song (with illustrations) was alone worth a journey across the Tweed to hear.

A Meeting of the Council was held in the "Waverley" Hotel on Saturday morning, at eleven, J. Traill Taylor in the chair.

The following new members of the Council were elected:—Prof. Herschel, Messrs. W. H. Walker (Eastman Company), Tate (Belfast), Bothamley (Leeds), McDougal (Dundee), T. N. Armstrong (Glasgow), and Dr. Hill Norris, Councillor Lancaster, Messrs. J. Place, J. H. Pickard, B. Karleese, Whitlock, John Collier, and Harold Baker (Birmingham).

Letters were read from four photographic societies appointing, as their representatives on the Council, the following gentlemen:—C. H. Bothamley, F.C.S. (Leeds), R. Keene (Derby), J. C. Cox (Dundee), and — Illingworth (Halifax).

The following Sub-committee was appointed to draw up the rules and regulations by which the Convention should be governed:—Messrs. J. Stuart, W. H. Walker, W. Jerome Harrison, Andrew Pringle, Smith, and Wollaston, together with the Chairman of Council and Honorary Secretary as *ex-officio* members.

A vote of thanks was given to Bailie Morrison for the loan of various articles used in the Exhibition.

Votes of thanks were also passed to the Edinburgh Photographic Society, to the Hon. Secretaries (Messrs. J. J. Briginshaw and Jas. Davie), to the Chairman of the Council (J. Traill Taylor) and of the Local Committee (John Stuart), and also to the leaders of excursions, and the local Sub-Committees.

These pleasant duties performed, the Convention was in imminent danger of becoming wealthy, as one gentleman after another got up to offer donations of five and ten guineas. It was decided, however, only to accept these in connection with the establishment of a Guarantee Fund.

After the Council meeting several of the members inspected the splendid studios, &c., of Mr. Turnbull, in Jamaica-street; while others paid a parting visit to the quays, detective cameras in hand. But the time to part soon came, and with hearty wishes for "our next merry meeting at Birmingham" the party separated, some to the Highlands and the Lochs, others to yachting, but the majority back to their daily avocations, bearing with them pleasant memories of a week charged full of pleasure and instruction.

THE EXHIBITION DEPARTMENT.

We here summarise the exhibits, which were very numerous:—

Houghton, London: Studio tent, portmanteau sink, negative and film washing trough, dark-room developing sink.—*Lancaster & Son, Birmingham*: Cameras, lenses, stands, &c.—*G. Mason & Co., Glasgow*: Lamps, cameras, papier mache trays, studio stands, large American cameras, &c.—*Albion Albumenising Company, Glasgow*: Studio camera and studio stands with compensating balance arrangement, portable cameras, 12 × 10, 10 × 8, negative washing troughs, lamp, &c.—*McGhie & Bolton, Glasgow*: Cameras, stands, &c.—*Place, Birmingham*: Shutters, &c.—*Wollaston*: Shutters.—*Moryson, Dumfries*: Patent show-case for photographs.—*Watson, Laidlaw, & Co., Glasgow*: Emulsion separating machines for A. L. Henderson.—*York & Son, London*: Two frames of lantern slides.—*Underhill, Croydon*: Lantern slides.—*F. W. Verel & Co., Cathcart, Glasgow*: Two fine photographs done on their plates.—*J. Urie, Glasgow*: Patent auto-printing machine and specimens done by it.—*Pollard, Graham, & Co., Derby*: Negatives and transparencies.—*S. Fry & Co., Kingston-on-Thames*: Bromide enlargements, &c.—*Morgan & Kidd*: Bromide enlargements and film roll holders, &c.—*Tylar, Birmingham*: Metal slides.—*Watson & Son, London*: Cameras, stands, &c.—*Shew, London*: Detective cameras, universal camera, clips for yachts, &c.—*McKellen, Manchester*: Cameras, &c.—*Wollaston*: A stereoscopic shutter.—*Ross & Co.*: A case of lenses.—*Sharland, London*: A detective camera.—*Taylor, London*: Two American detective cameras, and a specimen of Mayall's coloured photographs.—*T. & R. Annan, Glasgow*: Photogravures, autotypes, Sir Noel Paton's *Fairy Raid* on large opal, machinery, &c.—*John Stuart, Glasgow*: Autotype and bromide enlarged portraits, machinery, &c.—*Turnbull & Sons, Glasgow*: Large show-cases of photographs.—*Macnab, Glasgow*: Very large assortment of photographs, platinotype, bromide enlargements, silver prints, &c.—*Valentine, Dundee*: Views, &c.—*Oliver, Glasgow*: Transparencies.—*Murray, Glasgow*: Landscapes, portraits, &c.—*W. Snell Anderson, Glasgow*: Landscapes, portraits, &c.—*Donald Done, Pollockshields*: Views, &c.—*Alex. McDonald, Arran*: Views, &c.—*W. M. Martin, Dundee*: Views, &c.—*Mathewson, Dundee*: Views, &c.—*Brown, Paisley*: Photographs.—*R. Keene, Derby*: Platinotypes, &c.—*Wm. Crook, Edinburgh*: Enlargements, portraiture.—*R. T. Dodd, Glasgow*: Portraits.—*Wm. H. Glen, Derby*: Photograph.—*Charles Reid, Wishaw*: Studies of animals (specially good).—*H. Bolden, Derby*: Derbyshire scenery in platinotype.—*Bothamley, Leeds*: Specimens of orthochromatic photography.—*T. McGown, Paisley*: Carbon enlargements.—*J. McDonald, Gareloch*: Landscapes.—*J. Rennie, Helensburgh*: Landscapes, &c.—*Buchanan Wollaston, Chislehurst*: Film negatives, &c.—*G. Mackenzie, Paisley*: Carbon enlargements.—*J. Milne, Arbroath*: Portraits.—*J. G. Tunny, Edinburgh*: Enamel miniatures, &c.—*Wm. Lang, jun., Glasgow*: Eight frames of photographs (various).—*John Parker, Glasgow*: Views.—*Daniel Frazer, Glasgow*: Views.—*Cox, Dundee*: Figures and views, &c.—*Wm. Goodwin, Glasgow*: Views, &c.—*Ralston & Sons, Glasgow*: Carbon enlargements.—*Alexander Bros.*: Painted miniatures, &c.—*Hugh Reid, Glasgow*: Views, &c.—*T. N. Armstrong, Glasgow*: Views, &c.—*P. Falconer, Partick*: Views, &c.—*J. B. Willington*: Views.—*Ralph Elder*: Views.—*Archibald Watson*: Views.—*Dr. Bell*: Views.—*R. Dalglis*: Photographs in 1859.

We now proceed to give a more detailed account of some of the exhibits.

One of the most interesting, from an educational point of view, was a case of lenses by Ross & Co., London. It showed the history of one of their rapid symmetricals from the raw material up to the finished instrument. First, in this evolutionary process of mechanical art there were the rough brass castings before they were touched by the brass worker; and in harmony with these there were the crude pieces of optical glass, as yet unseen by the lens grinder. As the next stage, there were what had once been similar pieces of glass, but now they had been rough ground into lenses, both convex and concave. A third stage showed these lenses finished with an exquisite polish, but not yet having the elementary parts cemented together with balsam. Another portion of the exhibit was more interesting

still, for it was a lens complete in its mount, but bisected from end to end by a thin saw, the section showing the whole configuration of the lenses, brass work, diaphragm and flange, each in true relation to the other. The last item in this collection was a completed lens ready for being screwed on the camera.

C. Wollaston's diaphragmatic shutter is now pretty well known. Its principle consists in the opening and closing being effected directly opposite the centre of the lens, with an adjusting screw by which the exposure can be so regulated as to be either very rapid or protracted to any desired extent. A new departure, which was exhibited, consists in having the levers, shutters, and other fittings in duplicate, so as to be employed in stereoscopic photography, both shutters working with absolute simultaneity, whether fast or slow.

A camera of the *genus* detective, although named the "Compactum," was exhibited by H. Sharland, London, the manufacturer. It is devised by T. Samuels, who exhibited it, or one like it, at the Photographic Society of Great Britain only a couple of months since. It is undoubtedly the smallest detective camera—not a mere toy—that we have yet seen, the dimensions being eight and three-quarter inches long by four and a quarter by five inches in width and depth. Modest and unassuming in appearance, it can be carried in a wrapper of brown paper or be stuffed into the pocket of an overcoat, and yet it contains a dozen sensitive plates, each capable of being brought to the front, one after the other, with singular ease. The focussing arrangement of the lens is what we would designate, without regard to the niceties of nomenclature, a fixed adjustable one; that is, when a movable lever is brought to a certain mark everything between thirty feet and infinity is sharp. Moving the lever to another mark, the point of best focus is brought ten feet nearer, and so on till the object to be photographed is only five or ten feet distance. When a "shot" has been fired a button outside of the camera is run up in a groove and the exposed plate in its sheath is immediately raised, so as to be grasped by finger and thumb through a thin yet opaque protecting bag and transferred to a receptacle behind the others, the next in order assuming its place at the focal plane. When introduced commercially this "Compactum" will prove a favourite.

The "Scovill American," another form of detective camera, was also exhibited and received much commendation. As it is so recently since we gave a full description of it we refer our readers to page 307 of our issue for May 20. At one of the excursions, that down the Clyde to Tarbert, that same camera is known to have done some good work in the hands of its owner, who was the exhibitor.

An ingenious chronometric shutter, which, being in its elementary condition, was not considered as suited for the more public form of exhibition, was shown us by its inventor, Mr. A. Johnston, of Wick. It merits, however, special mention. Perhaps the term "chronometric," which is of our own application here, scarcely conveys a correct idea of its nature. This, however, will be seen from the following:—A common cheap watch movement, which can now be purchased everywhere for one or two shillings, has fitted upon its centre wheel or its "cannon pinion" (that which carries the long or minute hand) a disc of brass, having in it a deep notch. Pressing against the periphery of this disc is the end of a lever, which when the determined number of minutes have transpired falls into the notch of the disc and releases the catch of the shutter, which gives the exposure. One use of this system is to be found in connection with captive balloons; but it is applicable to anything in which a determinate degree of time is to elapse between the setting of the shutter and the instant of exposure. Our readers will not be slow in imagining many cases to which it might be applicable. Being at present in our office it may be seen on application.

A detective camera by Messrs. E. & H. T. Anthony & Co., of New York, claimed attention on account of its ornate appearance. It is elegantly covered in alligator skin. But as the manufacturers have kindly favoured us with illustrations of their Detective, we shall here make use of them in order to convey a clear idea of the instrument.

In outward appearance and to the ordinary observer this camera looks exactly like an alligator hand satchel that is carried by a

shoulder strap at the side of the pedestrian. Upon closer observation one sees that it consists of an artfully concealed detective camera, in which all the various movements to secure a picture are situated upon the under side. For use the camera is held so that the base of the satchel rests against the body of the operator. By means of a brass pull at the side the shutter is set. A plate in the regular holder is placed in position at the back of the camera, and the slide is drawn ready for exposure. The release of a short catch exposes the front of the shutter ready for action, and by raising a small leather-covered lid the little camera obscura called the finder, on the (now) upper side of the camera, shows the position that the object will occupy on the plate. The slightest touch upon a small brass button releases the shutter, and the exposure is made. Replacing the slide in the plate holder, reversing the holder, and setting the shutter again, leaves the apparatus in readiness for another shot, when the plate-holder slide is withdrawn as before.

By releasing a spring bolt on the under side of the case, the camera proper can be removed from its cover. When removed from the cover the camera can be used either vertically or horizontally on a tripod, by means of a tripod screw, which will be found in the front compartment of the camera beside the lens. The speed of the shutter can be regulated to suit the speed of the objects, moving with greater or less velocity; while, by simply releasing a catch, time exposures can be made at the will of the operator.

The cut (Fig. 1) shows the camera when laid on its side, and the



Fig. 1.

under portion exposed to view. When placed on its bottom, and the outer cover or satchel is raised, the appearance presented is as shown in Fig. 2.

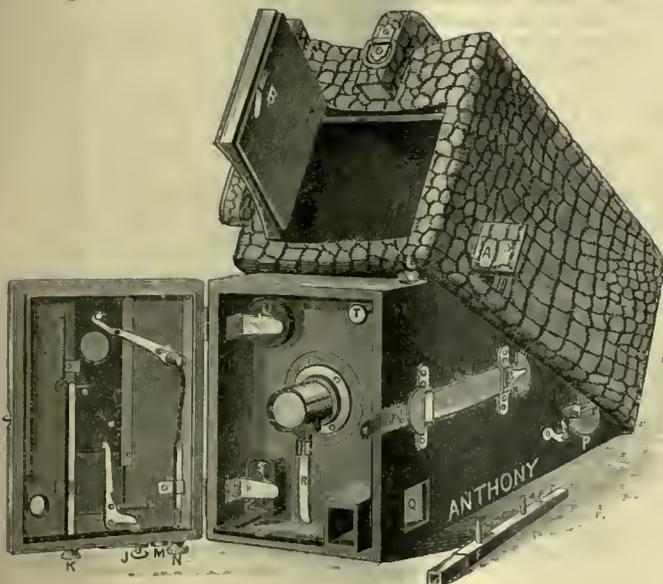


Fig. 2.

The reference to the various letters may be omitted here, as these mainly have to do with details of manipulation. But we may allude,

with a high degree of commendation, to that marked in Fig. 1 as II, the index finger of which represents, when set to any particular figure, the distance at which everything is in best focus. II, we need scarcely say, really represents the axis of a large pinion which is geared in a stationary rack. The finder differs from others that we have seen, inasmuch as it is composed of a tiny camera, with a ground-glass placed at a right angle to the axis of the lens, and the image is observed by means of a mirror set at an angle of 45° outside the focussing screen. The duration of exposure can be regulated to a great nicety. It accommodates one dozen of plates, and altogether contains many points of great ingenuity. The exhibitor will also show it at some of the London societies.

The camera, when detached from the satchel, presents the following



appearance: The dark slides, as will be seen, are accommodated in a separate case forming part and parcel of the whole.

(To be continued.)

CONVENTION JOTTINGS.—II.

(By our Special Correspondent.)

THE members of the Convention residing at the greatest distance from the place of meeting came flocking into the city first. On Saturday, Sunday, and Monday, there was a continual stream of cameras, tripods, boxes, and knapsacks peculiar to the wandering portion of the art-science professors, the possessors of which could be seen joggling along carrying their traps, or seated in cabs with their legs, &c., all spread out over the top of the vehicle, as they made for the various hotels.

On Monday a considerable quantity of work fell to the share of the Exhibition Committee, owing to the exhibits in many cases being so late in coming to hand. This is a thing that ought to be noted, and avoided at future meetings. All exhibits should in common fairness arrive some days before the opening of the exhibition, so as to allow of justice being done to all. So great was the press on this occasion that another room had to be arranged and fitted for pictures and apparatus, at which arrangement Mr. R. Turnbull was again to the front. To the credit of the late exhibitors themselves, however, it must be stated that they were both ready and willing to lend a hand, and toiled their level best to help on the hanging and filling up of their exhibits. All was in perfect order to receive the visitors before the hour of meeting.

The walls of the three halls were covered with pictures, and round the doorways were draped flag decorations, so that on entering the whole suite of rooms were at once seen, and the general effect was pleasing to the eye and had a decidedly imposing effect. The crowd of ladies and gentlemen streamed in till the place was filled.

At eight o'clock Bailie Crawford, as already narrated, took the chair, in place of Sir James King, who had arranged to open the proceedings, but at the very last moment he had unfortunately been called away on business to London.

A very excellent Chairman Bailie Crawford made, judging by the pleased, attentive, applauding audience that listened to his opening address; after which Mr. J. Traill Taylor gave an outline of the proceedings for the coming days, and stated that he had received some eighteen papers, so that there was plenty of work on hand for the evening meetings during the week of the Convention.

At this *conversazione* a part of the time was taken up by the ever popular lantern, presided over by the ever genial Mr. Andrew Pringle. He is always good fun, and when during the entertainment the voices out of the dark, which are always there, insist upon "knowing, you know," like Miss Dartle, he tells them you know, like himself. And he never needs to loaf around amongst his papers for his replies; he

carries them always ready away in his head somewhere. You can easily understand this part of the entertainment was a great success.

The first two excursions left Glasgow on Tuesday morning, and they were both well attended. That under the conductorship of Mr. George Bell, for the Falls of the Clyde, left the low-level station at eight o'clock a.m. for Hamilton, where they arrived after a railway run of about thirty minutes.

Here they found brakes waiting on them—one *brake* more than they wanted, and that was a break in the weather that had come round uninvited, and stayed with them pretty well all day. I was not there, but Mr. Bell informed me that the rain came pouring down so that the party agreed to leave out Tillietudlem Castle, and drive on to Stonelufers—the first of the falls. This, he says, is not a good fall from a photographic point of view. As for the visitor with limited time, there is only one point at which a view can be made, and at this point only one can take the picture at a time, so that if there are many about they have to wait their turn. From this place the party drove on to Lanark, arranged about dinner, and to fill up the intervening time drove on to the falls of Cora and Bonnington, and oh, didn't the elements revel here!—thunder, lightning, and rain—the weather clerk was evidently serving up samples of all kinds that were going to Mr. Bell to see which would suit his friends. It is marvellous to find, however, how much enjoyment can be extracted from a combined lot of light spirits, even supposing the weather was *slightly heavy*. The jokes that would not be suppressed passed along as the party had themselves posted up against the shelving rocks, to dodge the pelting showers that passed over their place of shelter. A fisherman, who was fishing in the river, was rather put out at so many tubes aiming and shooting at him, but when Mr. Bell told him that the party were photographers that had come from all parts of the three countries, and that his portrait would be seen in their pictures all over the world, he drew himself up, and looked mightily pleased, and posed to do credit to his country. After an enjoyable dinner at Lanark, some of the party returned to Hamilton, and others took train direct to Glasgow, highly pleased with their trip, in spite of the show of combined elements. This was the only trip that experienced anything like adverse weather during the week.

The Aberfoyle and Trosachs trip took place on the same day as the above. It was highly favoured from a meteorological point of view. Save for one shower, the day was beautiful.

Here a word may not be out of place regarding the returning of the cards which was sent to all members to fill up showing the trips they intended going by. Out of all cards sent out only twenty-five per cent. were returned, and hence the conductors were left in a sorry plight how to arrange, as special railway carriages were wanted and brakes had to be gathered together at the other end of the railway journey, the party anticipated being much too large for the usual conveyance accommodation on the route. Great credit is due to Mr. Armstrong for the masterly way he met the difficulties in connection with this excursion, and the time and trouble expended in arranging the same. Why, the probable number was quite a conundrum, and he guessed it very neatly.

Arriving at Aberfoyle, the land of the bold Rob Roy, and the scene of the famous encounter of Bailie Nicol Jarvie with the wild Highland gillie (for particulars see Scott's *Rob Roy*), the party divided, some going to Loch Ard, but by far the greater number embarking in waggons for the Trosachs and Loch Katrine. As we commenced the ascent of the mountainous slopes by the new private road made by the enterprise of the Duke of Montrose, and while proceeding slowly to enable our thoughtful chaperon, Mr. Armstrong (who remained at the inn until the last of the party had left) to overtake us, it was a scene not soon to be forgotten, to witness the stopping of the cavalcade by a bronzed daughter of these high altitudes, who demanded toll before she would permit us to penetrate farther into the mountain fastnesses. At this juncture the plucky Secretary of the North London Photographic Society leaping from the vehicle, approached the virago and shouted, "You drive on and I'll hold the woman." Oh, for a detective camera at that moment! But a word from Mr. Armstrong, who then approached, quelled the impending storm, a smile chased away the frown, and shaking her fist good-naturedly at her would-be assailant, the custodian of the waggon road wished us all a pleasant journey.

The charm of that run from Aberfoyle to Loch Katrine is undescribable. The wild beauties of nature came into view picture after picture, filling the eye and the soul. Mountains, lochs, tourists, and dales, ever changing, far as the eye could reach, and the broad shifting patches of sunlight playing at hide and seek as they move on from promontory to promontory, and we settled ourselves down to enjoy to the full these charms of nature's choicest gifts.

As we were leaving the conveyances to walk round in search of

likely places for the best pictures, one of our party was accosted by a beggar woman, to whom he gave some coppers. The gift being beyond her anticipations, she was very profuse in her thanks, and exclaimed, "God bless you, sir! may you and yours be in heaven this night."

"Well!" he replied with a laugh, "I have no objections to the place, you know, but please don't be so particular about the time."

"Will you take a drap?" said one of our party to a Highland man he saw sitting at the stream.

"Oh, yes, sir; she'll tak' a drap. This water, sir, can stand an awful lot o' whusky—it's guid water," and pouring out most of the whisky into the cup, he put very little water into it, and took it off at one gulp, proving by demonstration that the water could stand a lot of whisky, then handed back the nearly empty flask with thanks.

The busy scenes being enacted amid these mountain gorges reminded me of a somewhat similar experience of more than ten years ago (see *Noctes Washingtonia*, in *THE BRITISH JOURNAL OF PHOTOGRAPHY*, vol. xxiii., page 501), and finding my old friend "Mungo" lolling under the shadow of a rock, we lighted our pipes and recalled those days of yore, singing together his song of 1876 with immense satisfaction, he adding to it a continuation he had just finished *apropos* of the present Convention. I here give them both, as *impromptus* of brother "Mungo."

THE CAMERA-MEN OF 1876.

O'er brake and through dell, by wood, copse, and fell,
In cool glint, in burnie, and glen,
Where Scotch bell and fern dress boulder and cairn—
Views worthy our Camera-men.

The sun in the vale is gleaming, gleaming;
Each hero keeps working his cell;
I, 'mongst the clover, lie dreaming, dreaming,
Enjoying myself full as well.

The sun sheds his rays o'er hills and o'er braes.
A glimpse of McEidin just then
I caught through the trees, as some object he sees
That is worthy the Camera-men.

The sun in the vale, &c.

Wi' dry plates and wet, they hurry to get
Impressions of lake, hillock, and fen.
What's that glad sound in the air all around?
'Tis the song of the Camera-men.

The sun in the vale, &c.

With silver trimmed sheen, nature dressed in bright green,
And the murmuring, gurgling glen,
Are gems of delight to the sons of the light—
Rare studies for Camera-men.

The sun in the vale, &c.

And thus all the day—half work and half play—
With a few minutes rest now and then,
From the land of the Scot bright impressions were brought
That will live with our Camera-men.

The sun in the vale, &c.

CONVENTION, 1887.

We had that last show a long while ago—
In years it is numbered by ten—
When, on classic ground, the brothers moved round
To the march of the Camera-men.

The sun in the vale, &c.

The sun it has set on the days of the wet,
Familiar to all of us then;
Now, *dry* paper and glass move on through the pass
In this march of the Camera-men.

The sun in the vale, &c.

We've no bath and no tent, when on pictures bent—
An advantage of *now* over *then*—
Our portable kits lick the old ones to fits
In this march of the Camera-men.

The sun in the vale, &c.

A week I'd enjoy, in this land of Rob Roy,
And not feel content even then,
Were the feelings expressed by the brightest and best—
The rollicking Camera-men.

The sun in the vale, &c.

All around the loch, made famous by Scott's *Lady of the Lake*, we enjoyed a good time picture making in the midst of scenes so grand, profuse, and varied—scenery of its kind not to be surpassed in the world. We would have over twenty cameras with us, and had

the advantages of a fair day with little or no wind, so that the workers had every opportunity of procuring fine effects. Mr. Armstrong, who had been over this ground many times previously, took the visitors to the best places for pictures, and thus saved them no end of trouble looking out for them themselves. When we were ready to start home again, a few of the company like sheep had gone astray, and considerable hunting over the place had to be done before we got the lost ones gathered together. Over the hills we came at a spanking rate, and were just in time to reach the station before the train starting time.

In a half-sleepy state, as we were spinning along in the train, I could hear the indefatigable Alexander propounding the following conundrum:—"If the aperture opening of the diaphragm was $\frac{1}{10}$, and the speed of the shutter was one-hundredth part of a second, and the object to be taken was forty feet—no—say twenty feet from the camera, what movement would take place during exposure if the moving object was going at —" They all took out paper and pencil and started to work it out. I fell asleep, for—

"Ta Hielan' bills are high, high, high!
Ta Hielan' lochs are long;
An' oh, my frien's, ye'll all agree
Ta Hielan' whusky's strong."

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 9530.—"Improvements in Holders for Sewing and Travelling Outfits, Cigar and Photograph Holders, and Similar Articles." S. HAHN.—Dated July 6, 1887.

No. 9693.—"An Improved Photograph Frame or Holder." W. D. WILKINSON and F. FOWLER.—Dated July 11, 1887.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
July 19	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
" 19	North London	Myddelton Hall, Upper-st., Islington
" 19	Bolton Club	The Studio, Chancery-lane, Bolton.
" 20	Bristol and W. of Eng. Amateur	Queen's Hotel, Clifton.
" 20	Bury	
" 20	Hyde	Mechanics' Hall, Hyde.
" 20	Manchester Club	
" 20	Edinburgh Photo. Club	5, St. Andrew-square.
" 20	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 21	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION. On Thursday night, July 7, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. F. W. Cox presided.

Mr. John Warwick Wharton was elected a member of the Association. A question in the box asked what conditions governed the obtaining of the maximum of detail in the shadows of prints upon albumenised paper.

Mr. A. COWAN responded that it depended upon the negative and not upon the printing.

The CHAIRMAN thought printing in subdued light to be a favouring condition.

Mr. W. M. ASHMAN said that with a very dense negative full of contrast and detail the paper should be prepared upon a weak silver bath, to avoid bronzing in the shadows; if ready sensitised paper is used it should first be floated upon distilled water, to wash off the silver to some extent. Once he had to print from a negative of great importance, but full of the most violent contrasts; it was very dense, taking nearly a week in the printing frame; he accordingly floated his albumenised paper for ten minutes upon a silver bath, thirty-five grains to the ounce, then he washed it by floating upon distilled water. After exposure for about a week, and by the aid of a lens bringing out detail in the densest parts by concentrating the light upon those portions, he succeeded in printing all the detail contained in the original negative. In using the lens it is necessary not to concentrate the sunlight too much or the negative may get cracked with the heat.

Mr. W. H. HARRISON remarked that the Photographic Society of Douai had initiated steps which might lead to the organizing of an International Congress of Photographers in Paris at the time of the Exhibition there in 1889.

The CHAIRMAN thought that such a meeting in Paris would be hailed with pleasure by English photographers.

Mr. ASHMAN hoped the corresponding members of the Association in Paris would keep the Association promptly informed about all steps taken in the matter.

The CHAIRMAN thought that the subject should be revived at a subsequent meeting, when so many members of the Association were not absent at the Glasgow Convention. He should like to know how to remove silver stains from negatives.

Mr. MOUL said that rubbing them with alcohol would take them out when they were just beginning and were very slight.

Mr. ASHMAN stated that Mr. Robertson, of Dundee, had said that if an organic salt of silver had been formed, treating the negative with a sulphocyanide followed by hypo would effect the removal; he (Mr. Ashman) had never met with any photographer who had succeeded in so doing, but if the plan were workable it would be very valuable. He had been asked if gold size varnish could not be applied with advantage to film negatives. Mr. Bridge had published that it answered perfectly, and rendered the films transparent at the same time.

The CHAIRMAN, in the course of a discussion about vaseline and varieties of paraffine, said that he knew that paraffine oil would promote the growth of hair, for some had been spilled over a cat of his; at first the hair came off where the paraffine fell, leaving a bare skin, afterwards it grew again in those places, but thicker than before. It had been said at the Photographic Club that one photographer used a cat as an actinometer, and judged the intensity of the light by the size for the time being of the pupil of the cat's eye; if the pupil were but little contracted it was not a good day for photography.

Mr. MOUL and Mr. ASHMAN said that some of the most popular prints of wild animals in the market had been copied from greatly enlarged negatives.

Mr. HARRISON asked how Anschutz produced the scenic surroundings and backgrounds to his photographs of wild animals.

Mr. EDGAR CLIFTON had been told that Anschutz placed himself in a kind of a cage which was put into their dens, and that the backgrounds and accessories were fitted up in the dens.

The CHAIRMAN had been told that Anschutz had been trying without success for six months to obtain such pictures as he required of the lions, and at last obtained a number of good photographs of them in the desired attitudes all upon one day.

Mr. ASHMAN, in reply to a question, said that the fault of isinglass as a substitute for a commoner gelatine in photography was that plates prepared with it had a great tendency to wrinkle whenever they came into contact with any aqueous solution. In reply to another question, he said that he had found that lactates often proved useful in sensitive surfaces for photographic printing.

Mr. HARRISON imagined that ferrous lactate might be useful for developing; it kept well both in crystals and in powder, and was soluble in water, which, however, would only take up a few grains to the ounce.

The meeting then broke up.

CAMERA CLUB.

THE results of the first year's working of the above Club were before the members at a meeting held on June 16. The present prospects of the Club are most encouraging, and the number of members is rapidly increasing. Owing to the Club having been started with comparatively few members (two hundred), to the exceedingly heavy opening expenses, and to its having been carried on for fifteen months on twelve months' subscriptions, a loss was incurred on the working up to December, 1886; but with the present membership, three hundred and forty, the financial position is most satisfactory and promising, and there is every reason to expect that the Club will steadily develop as a centre of attraction for the amateur photographic world.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held on Tuesday, July 5, at Myddelton Hall, Islington, N., Mr. Alexander Mackie, Vice-President, in the chair, Mr. N. P. Fox was elected a member of the Society.

The CHAIRMAN announced that, in the absence of the Hon. Secretary, who, with the President and several other members of the Society, was attending the meeting of the Photographic Convention at Glasgow, Mr. F. W. Cox had kindly consented to officiate as Secretary.

A number of prints from negatives taken at the Jubilee outing at Watford on June 21 were exhibited by Messrs. Liddle, Piesker, and Walker.

Mr. A. P. Higgins showed prints from negatives taken in Spain, among them a very interesting instantaneous view of a bullfight at Malaga.

Mr. N. P. Fox passed round views of the Jubilee decorations, taken at four a.m. on June 22.

Mr. J. Jackson exhibited a stereoscopic transparency on a collodio-bromide plate. In toning it with gold it had become stained in the sky of both halves. The effect produced was, however, very pleasing, the appearance being that of a vivid sunset in natural colours.

Mr. WILLS passed round a negative which showed a silver stain caused by contact with albumenised paper while damp. He wished to know if the stain could be removed.

The CHAIRMAN said it was an important question, as it was an accident to which everyone was liable. His experience was that the same remedy would not prove efficacious in every case. When the stain was recent and had not penetrated far into the film, rubbing the spot with a piece of rag moistened with turpentine would sometimes remove it; in other cases he had found a solution of cyanide of potassium useful.

Mr. JACKSON objected to cyanide of potassium, as it reduced density too much.

A MEMBER said it had been suggested that for this purpose the cyanide should be dissolved in spirit instead of water.

Mr. OAKLEY had found a strong hypo bath remove the stain without injuring the negative.

Mr. E. CLIFTON had been successful rubbing with a rag moistened with spirit.

Mr. HIGGINS having shown and explained the working of a Durnford's right-about-turn shutter, an interesting discussion took place on the merits of and objections to shutters of various types.

The CHAIRMAN said that to be perfect a shutter should open and close in no time, so that the full amount of light capable of passing through the lens should act on the plate during the whole of the exposure. This was, however, practically an impossibility except in the case of a shutter working close to the plate.

Mr. JACKSON said he had tried many forms of shutter but preferred the

simple drop form working close to the diaphragm. The shutter he used was of metal and he regulated the exposure by means of a longer or shorter drop.

Mr. CHURN found that in using Lancaster's rotary shutter there was a jar which caused a blur.

Mr. CLIFTON thought the jar occurred in releasing the disc. The spring of the catch was generally too strong. If this were made to work easily and a firm stand used he thought the trouble would not occur.

Mr. COX having exhibited a platinum print in which clouds were printed in, there was a discussion on printing-in skies and combination printing generally.

Mr. CLIFTON said that a method of combination printing which was particularly useful for printing figures into landscapes or printing landscape backgrounds to figures, had been originally adopted by Mr. Edge and subsequently by Mr. E. Dunmore with great success. In printing a background to a figure, for instance, the whole of the negative except the figure was blocked out, a print from this giving the figure on a white ground. The figure on the print was then painted over with ordinary gamboge water colour, which was allowed to dry. When dry the print was adjusted to the required position behind the landscape negative and printed in the usual way, those parts covered with the gamboge, being protected from the light, not being acted upon. The print was then fixed in the usual way, the gamboge being gently sponged off in the first washing water.

The proceedings terminated with a vote of thanks to Mr. Cox for acting as Secretary.

Next meeting, Tuesday, July 19. Subject to be announced. Outing on Saturday, July 16, to Buckhurst Hill. Train from Liverpool-street at twenty-six minutes past two.

Correspondence.

THE LATE CONVENTION.

To the EDITORS.

GENTLEMEN,—Being one of the crowd who attended the Photographic Convention of the United Kingdom, held in Glasgow last week, I wish, through the medium of your paper, to express to our Northern hosts my appreciation of their great kindness, shared in by all who were there to partake of the hearty welcome and generous hospitality shown to us by our amateur and professional brethren of Glasgow and Edinburgh. The arrangements made by the various local committees for the Convention, and the members who attended were simply such as to command our unqualified approval and imitation.

The great success of the second Convention is mainly due to the zeal with which our Scottish brethren made and carried out the details. No one knows, but those concerned, the work this implies. I trust the success achieved by our Scotch friends will act as an incentive to the English members, and rouse their enthusiasm, so as to make the next Convention (to be held in Birmingham) even a greater success. I have only to add that those members who were unable to attend missed a great treat.—I am, yours, &c.,

W. H. PRESTWICH.

155, City-road, London, July 13.

NEW RULES OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

To the EDITORS.

GENTLEMEN,—Now that an effort has been made to accomplish real progress in the business of the above Society, it may not be out of place to mention that a draft of certain alterations, modifications, amendments, and additions to the code of rules of the Photographic Society of Great Britain as passed in 1874, have been recently circulated by the order of the Council, the said alterations having in view the more efficient conduct of the Society's affairs. Of course, when a governing body voluntarily initiates much needed reforms without fear of the probable effect upon themselves, the act is of a nature which deserves to be highly commended, and I think all interested will admit that the revised laws are upon the whole very welcome.

The special meeting called for Tuesday, 19th instant, for the consideration by members of the various provisions embodied in the draft, is too near at hand to admit of previous controversy in your columns. May I therefore ask your indulgence in the matter of space to remark upon one or two points which will give time for the members to consider before the time of the meeting, if they have not already done so? The present month is, perhaps, the worst time of the year for securing a large attendance of members, but the same period was chosen before for a similar purpose, with the result of an exceedingly small meeting.

In the new Rule V. it states, "The Council shall appoint two Honorary Secretaries; the Hon. Secs. shall attend the meetings of the Society and Council, and take minutes of the proceedings. They shall conduct the correspondence of the Society, and one of them edit the journal, &c." These gentlemen are to be appointed by the Council from the members of the Council, so that practically a Council of twenty will have to be elected each year instead of eighteen. I should therefore suggest for consideration the advisability, or otherwise, of acquiescing in that plan, instead of the members nominating two Hon. Secretaries to fill these important posts annually, as they are permitted to do in the case of President, Treasurer, four Vice-Presidents, and eighteen Councillors.

Then in Rule X. it states, "Every member of the Society shall be at liberty to nominate one member as President, two as Vice-Presidents, one

as Treasurer, and six as ordinary members of Council," thus limiting a member's nomination to half the number elected of Vice-Presidents, and one-third of the Councillors. He may nominate only ten in all, but twenty-six have to be elected. Surely no great harm could happen if a member actually nominated twenty-six men whom he believed to be capable and willing to do the work.

Another point is that of providing against continuity of office (other than President), by making retiring members ineligible to again serve within a year. As the rule now contemplated stands, all officers (other than Hon. Secretaries not mentioned) retire annually, but are eligible for re-election, therefore one of the three following conditions must happen at every election. (1), A house list nomination of the entire officers much the same as now constituted. (2), An exchange of official posts as heretofore the custom. (3), An entirely new Council, &c., unused to the work.

Neither condition seems desirable. I therefore submit that the old system which required the retirement of a Councillor after three years' service would, if coupled with ineligibility to fill any other office for one year, be successful in breaking the link whereby it becomes possible for any member to be once an officer always an officer, whether the Society's best interests suffer in consequence or not,—I am, yours, &c.,

W. M. ASHMAN.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

A. Rogers, Bacup.—*Jubilee procession.*

F. Hoare, Cirencester.—*Two photographs of Jubilee procession.*

S. S. Crewdson, Ulveston.—*Photograph of Barrow's Monument and stack for Jubilee fire on Had.*

J. Gibson, Penzance.—*Two views of the Bishop Lighthouse, Scilly Islands.*

H. A.—See an article on the subject on page 521 of our volume for last year.

J. S.—We are sorry we do not know the present addresses of the gentlemen named.

ONE IN A FIX.—Bring the lens to our office any forenoon; we can then tell you all about it.

W. INGLIS ROGERS.—We shall be pleased to have the promised article not later than the middle of November.

M. H.—If the negatives are moderately weak, print in diffused light; if excessively strong, sunlight is to be preferred.

J. T.—We regret our inability to indicate the principles by which Dr. Scott was guided in the preparation of his Table of Exposures.

TAIX.—Better put your query to the *Electric Review*, which is an authority on the construction and power of the different batteries of the latest type.

R. Y. L.—Immerse the opalotype in a five per cent. solution of alum for a few minutes, rinse and dry. This will prevent the film from forming the pustules when the washes of colour are applied; but avoid the matt varnish.

A DUBLIN AMATEUR.—Ruby glass is employed because it is more non-actinic than the yellow formerly used. Gelatine plates are more sensitive than collodion, hence the necessity for using a less actinic light in the dark room.

STEPHEN TALLON.—1. If the glass be perfectly waxed there should be no difficulty in removing the films.—2. Asphaltum dissolved in benzol. Use the solution dilute.—3. Albumenise the paper with plain albumen, and sensitise it by floating the back on a five per cent. solution of bichromate of potash.

E. J. HUGHES.—It is impossible to say which of the two is the more rapid plate except by trial. If you write to the maker, however, he will supply the information. If the stopper is so firmly set as to resist the treatment to which you have subjected it, the best plan will be to knock the neck off the bottle and transfer the contents to another. Before doing this you might turn the bottle upside down and allow it to rest in that position for twenty-four hours, and then repeat the treatment with heat. Sometimes, if the bottle contains an alkali and the stopper gets fixed by its action on the glass, this may loosen it when followed by heating.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—Outing on Saturday, the 16th instant, to Chigwell. Train from Liverpool-street at thirty-five minutes past two p.m. to Buckhurst Hill.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, July 20, 1887, will be on *Toning*. Saturday outing, Chislehurst. Tea at "Bull's Head," Chislehurst. Train from Cannon-street at twenty-five minutes past two.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1420. VOL. XXXIV.—JULY 22, 1887.

OWNERSHIP OF NEGATIVES.

In a leading article a fortnight since we dealt with the old and often vexed question as to the right to the negative, taken in the ordinary course of business, so far as relates to portrait photography. There may, however, under certain circumstances, be instances when the "custom of trade" as regards portraiture may be somewhat in doubt, or might possibly lead to litigation unless specially guarded against. We allude more particularly to such negatives as are taken, on commission, for special purposes. In such cases, however, it is customary to make some definite agreement or stipulation as to the disposal of the negative at the time the order is given.

A photographer may be called upon to photograph a document or deed for legal purposes, or, possibly, to copy a picture for, say, photogravure, or other mechanical process not worked by himself. In cases of this description, however, it is usual to have a clear understanding as to who shall possess the negative. When this is done, and it always should be, no dispute is likely to arise. But when it is not, and the photographer stands upon his customary right to the negative, it might give rise to litigation, and in the event of this, the result may very much depend upon the mere wording of the bill or invoice. Let us take an example.

A photographer is commissioned to photograph, say, a mansion and supply a number of copies. He attends, takes the negative, supplies the necessary number of duplicates, and sends in his bill in something like the following terms:—To photographing so many views of such and such a place, so much; and so many copies, so much. In this case, to whom does the negative belong? By many it might be assumed, as a definite charge is made for "photographing," that the negative is the property of the customer, but the custom of trade says differently—that it belongs to the photographer, notwithstanding that he has made a definite charge for photographing, and this view has been sustained in a court of law, as will be seen by reference to page 202 of our volume for 1884. The facts of the case were these:—

A photographer sued in the Swansea County Court the defendant for the sum of five pounds eight shillings and sixpence. The claim was in connection with taking certain photographs of a vessel with groups of the officers on board, the amount of the artist's bill being ten pounds eleven shillings and sixpence made up of the following items: Five pounds eight shillings and sixpence was charged for "photographing" the vessel and groups, and five pounds three shillings for extra copies supplied. The defendant paid the latter amount, but declined to pay the remainder unless the negatives were given up to him, hence the action. The defence was that as a charge

was made for executing the negatives they belonged to the defendant. The judge, after hearing the facts of the case, said, "If you order a photograph, unless you make special terms for the purchase of the negative, the photographer is not entitled to give it up." To this the advocate for the defendant replied, "If he asked a man to make something for him, and he afterwards asked for copies and paid for them, they were his. If a photographer charged him for taking a negative did it not belong to him?" The judge said, "No; it is part of the instruments used in the business. It is what a photographer uses in his business to make photographs. Why should he part with the instruments of his trade? A negative may be a secret in his trade, and he does not part with it unless there is a special contract to that effect." In further argument the advocate for the defence remarked, "Suppose I ask a man to make an engine and he charges me for the patterns, do the patterns belong to me or do they not? If he charges me for them they are mine; if he does not charge me for them of course they are not mine." The judge then said, "But here he does not charge for the negative. He charges for his work and for copies, and he makes an estimate accordingly. You want photographs for your friends; it does not matter to you how he makes or produces them. There might be other means to produce what you want; therefore what has this to do with you. He charges you for the expense in producing what you want. As I said before, he estimates the cost of producing, but does not sell the material used in the production. He wants it for other purposes." In the end the verdict was for the photographer for the full amount claimed with costs and advocate's fees. Leave to appeal was given, but the judge added, "I think, however, it will be useless to appeal." We believe the appeal was not persisted in; consequently this decision stands as a precept the same as the one quoted a fortnight back with reference to portrait negatives.

Had the judge in this case not been so fully cognisant, as he evidently was, of the usages of photographers, it is quite possible that the ruling might have been different. Curiously enough the arguments *pro* and *con* adduced in this case are very similar to those brought forward in the recent discussion on the subject of the right to the negative.

Photographers will, however, do well to be careful in the wording of their bills and invoices in cases like the one just referred to, as upon this much may turn in case of litigation. We have seen invoices made out somewhat as follows:—To taking a negative of, say, a mansion and one proof, so much; duplicates, so much, &c. Now although taking a negative and photographing are synonymous terms amongst photographers, they may not always be looked upon as such by laymen, or by

a judge or jury. Here a definite charge has been made for taking the negative and, may be, if the work has been executed at a distance from home, an additional charge is made for travelling expenses. Now in face of such an invoice as this the Court, not being fully informed of the custom amongst photographers, might, on the point of law, decide adversely to the photographer. But if the invoice were in different phraseology, worded, say, like this:—To a photograph of such or such a subject, so much; and so many copies so much in addition. In this case, although the items charged are the same, the wording of the claim is widely different.

In making out their accounts photographers will do well to avoid making a definite charge for "taking a negative," or even "photographing," as that to the uninitiated implies a certain degree of right to the negative, an idea that might be confirmed by a solicitor, if his opinion were invoked, strictly from a legal point of view. As a matter of precaution, the claim should always be made out for the finished work as it is delivered, and not for its execution. We direct attention to this phase of the question as it is always advisable to avoid litigation when possible.

REFERRING to our remarks a few weeks ago upon the use of coal gas, it may be remembered we described a method of getting rid of the residual gas left in the indiarubber tubing commonly employed for attaching the Bunsen or other burners to the main supply pipes. We may now call attention to another method which we have lately seen in use for the same purpose. Amongst photographers generally, whose use of gas for heating is probably confined to the employment of a single Bunsen, we must say we have rarely seen in use the very simple tap of Mr. Fletcher's make described in our article; yet we may again point out it is most simple in arrangement, and so easy to use that a boy could with safety put it to work. All that is needed in the shape of fitting is as follows:—First, turn off the gas at the meter; then ascertain the position of the lead supply pipe, usually embedded in the plaster coating of the wall of the room, pull it forwards for a few inches of its length (which is readily done by chipping away at the plaster), and cut a piece out about half an inch longer than the metallic part of the Fletcher tap. This tap is supplied with a small piece of rubber tubing slipped over each end, and the free ends of these short tubes are slipped on to the two ends of the lead pipe left after cutting the piece out, and the junction is complete. The tap is sent out with also an attached plate bored with holes, for the purpose of being attached by screws to any existing woodwork, or, failing that, to a peg of wood driven into the wall.

MANY people, however, are much afraid with meddling with gas in any manner that suggests a possible advantage of calling in the inevitable man and a boy. For these Mr. Fletcher has devised still another contrivance so simple that it could be attached by a blind man; it can only be used where there is already a gas bracket fixed, but what room is there nowadays without such a fitting? This bracket tap is attached to the base of the bracket. The existing bracket arm is unscrewed from its socket, leaving attached to the wall only that portion of the brasswork containing the tap. The Fletcher tap is screwed into the hole from which the brass arm has just been removed, and then into this added arrangement the arm is screwed. The indiarubber tubing for the Bunsen, &c., can be attached in the usual way, and the use of the old illuminating burner is not interfered with in the slightest. This supplementary brasswork has two taps, one to prevent the gas when turned on passing when not required into the illuminating arm, and a second to regulate or stop the supply to the Bunsen. Now by this arrangement the tubes can be freed from gas just as in the method described on a former occasion, thus:—When it is required to put the heating burner out of use, let the illuminating burner first be lighted; next turn off the gas at the old tap—that is, the one belonging to the bracket proper—the result will be that although the gas is turned off, the upper burner will remain

alight for a minute or two, the small flame being supplied by the gas left in the rubber tube, which by reason of its lower gravity escapes by the upper orifice. We have tested this plan ourselves, and can assure our readers that it thoroughly answers. In establishments where rubber tubing of some considerable length is employed, the gain to the sweetness of the atmosphere is no inconsiderable boon.

THE use of gas for all purposes of lighting and illumination is daily increasing, and marvellous already are some of the contrivances devised for utilising these two phases of its power. We have not yet to chronicle the abandonment of electricity for gas, though we are of opinion that this is far from impossible. An impetus to the invention of new forms is given by the Prussian Society for the Promotion of Industry, which has recently offered a gold medal and two hundred and fifty pounds sterling for the best work on light and heat radiation of burning gases. The end of next year is fixed as the time limit for competitors.

THOSE of our readers attending the British Association who are interested in the opposite side of the question—the electric—will no doubt be interested by the lecture of Professor Forbes, F.R.S., who gives as the subject of the Saturday popular lecture, *The Electric Light*.

PHOTOGRAPHERS are indebted to Mr. Bothamley for the very full account of orthochromatic methods given in his paper read before the Convention. It will be observed, *apropos* of the patent question, that some of the colours he describes do not belong to the eosines at all. First on his list is chrysaniline; this does not belong to the eosines. Erythrosine, of course, as we have before described, does so belong, as also does rose Bengal, which is a soda salt of tetraiodochlorfluorescein. We do not believe that the last word by a great deal has been said upon orthochromatic plates. They have a future before them.

WE understand that the number of foreign men of science who have accepted invitations to attend the next meeting of the British Association is unusually large. The list embraces the names of men of the highest eminence in both hemispheres; almost every country in Europe will be represented.

PROFESSOR R. H. THURSTON lately presented to the Washington meeting of mechanical engineers some memoranda on the production of large photographs by the usual blue process from engineers' drawings on tracing paper, and exhibited a print eight feet long and more than a yard in width. The method adopted, due to Professor Cleaves, does not require the use of any plate glass, and there is no practical difficulty in executing a drawing of almost any dimensions—ten feet by thirty feet, for instance. Professor Cleaves's apparatus consists merely of a cylinder of a length exceeding that of the widest drawing to be reproduced, and of a diameter such that the longest tracing to be used can be wrapped around it with sufficient space to spare to give room for the clamps by which it is drawn into place and held. The cylinder is smoothly covered with felt, and the sensitive paper carefully wrapped about it, the tracing to be copied being drawn over the whole and held smoothly in its place by spring clamps, which seize its ends. It is found to be easy to lay the tracing smoothly over the surface, and to draw it into contact so perfectly that the work done by this method is even better and more certain than that produced by the ordinary plate-glass apparatus, even with the air cushion now so successfully used with it. It is stated, too, that with a little care and practice it is absolutely easier to make these prints in the manner described than when glass is employed.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

THE following paper was unavoidably left over last week:—

COLOURED CHLORIDE OF SILVER.

By W. H. HARRISON.

FROM time to time, in most civilised countries, and not always in the great gooseberry and sea-serpent season, the daily newspapers announce to their readers the discovery at last of the means of taking photographs

in natural colours; in such cases investigation always proves that the vendors of such photographs are taking them by known methods and afterwards colouring them by hand. These commercial ventures have nothing to do with true heliochromy, the first recorded experiment in which was performed by Seebeck, of Jena, in 1810; the subject was in later years studied and brought to a moderately advanced state of perfection by Becquerel, Poitevin, and Saint-Florent. Sir John Herschel observed some of the phenomena of photography in colours, but did not follow them up, and Niépcé de St. Victor—nephew of Niépcère Niépcé, one of the fathers of the photographic art-science—produced some of the best photographs in natural colours which have yet been seen; for the most part, however, he merely made use of Becquerel's discoveries, and in this matter was shining chiefly by reflected light, as I have recently become aware while reading up the original memoirs in the history of this subject. Silver plates for this class of work have given the best pictorial heliochromic results, those on paper not being so true to nature after the partial fixing of the proofs. A chief difficulty always has been the fixing of these pictures; some of them will resist the action of daylight for a few weeks or months, but those who produced them say that they will fade at last. They are products of scientific and not of commercial interest.

Quite recently Mr. Carey Lea, of Philadelphia, who has been indefatigable in original experimental photographic research, has succeeded in producing red or violet chloride of silver in bulk, and it is possibly the same substance upon which heliochromic results have been obtained by early experimentalists; hence, as the record came under my notice while reading archaic documents for other purposes, I thought it might be well to translate and forward to the present Photographic Convention at Glasgow what Becquerel thought of the coloured chloride of silver upon which he obtained his photographs in natural colours.

In vol. xxii. of the *Annales de Chimie et Physique*, Paris, 1848, Becquerel says:—

"I think that the compound formed on the metallic silver under the action of chlorine, is a special chloride, perhaps a violet subchloride, or a mixture of white chloride and subchloride."

In the *Annales de Chimie et Physique*, vol. xxv., 1849, he says:—

"If freshly precipitated white chloride of silver is taken, well washed in obscurity, then extended upon ground-glass or paper, and a portion of it covered with an opaque screen, while the other part is exposed to a feeble light, when the solar spectrum is afterwards thrown upon the surface, so that half of it falls upon the exposed, and the other half upon the unexposed part, the action of the spectrum upon both can be observed simultaneously. After the lapse of a little time, and with diffused light eliminated, under the blue and violet rays both the chlorised sections are alike coloured violet; from the red almost to the blue no effect is produced upon the white chloride in less than about half an hour, while on the pre-exposed chloride the red rays give a slight rose tint, and the green rays a green tint. If, instead of using well washed chloride, photographic paper with free nitrate of silver is employed, the effects are complicated, and the colours entirely masked. The effects of continuation between the blue and red, which I described several years ago, can then be observed. . . . Among the solutions which destroy the colours of photochromatic images, and which dissolve and decompose chloride and subchloride of silver, and precipitate metallic silver, the most active is liquid ammonia. When a coloured proof of the spectrum is washed with this, the spectrum appears as a greyish band upon the brown ground of the plate. But if this band is examined with attention while the film is still wet, it is seen that the extremity which was red before the washing has now a slight green tint, whilst the previously violet extremity is now blue; these tints are complementary to the first; when the plate dries the effect disappears."

Mr. Carey Lea seems to me to have been making chloride of silver reduced in small part to a coloured mixture which curiously resists the solvent action of nitric acid; the heliochromic films are likewise partially reduced, but by exposure to diffused light or prolonged heat before they are used to photograph colours. When, however, one has haloid salts decomposed to such an extent as to be coloured red or violet, I do not yet see what that has to do with the nature of the latent image, in which there is no evidence either to eyesight or to chemical tests that such coloured salts have been formed. That an image should develop where a sensitive plate has been marked with hypophosphite of soda, perhaps merely means that the developer has a more intense action there, as from its composition one would expect hypophosphite of soda to be a developer; it is not so, however, at normal temperatures. That a weak solution of it should have a retarding influence may be regarded as a curious unexplained fact. Supposing that the method had been continued until the water used to mark the film contained no hypophosphite of soda at all, and supposing a developer were then applied to the film before it was absolutely dry, would not with most plates the silver deposit upon the damp parts then be lighter than upon the rest of the plate? Mr. Carey Lea's utterances about the red haloid salts do not seem to be yet finished, and these critical comments are made chiefly with a desire for additional information. I am very glad to see his contributions once more in photographic literature.

As in most original discoveries, at first it is impossible to see the future practical value of Mr. Carey Lea's interesting revelations, nor does the true man of science care for future practical issues when laying bare to the world a new truth about the phenomena of nature. In this instance chemical methods of producing heliochromic chloride of silver in bulk seem to have been discovered, consequently if Mr. Carey Lea would tell us how attempted pictures in natural colours produced upon it compare

in point of accurate rendering of hues with those obtained by Edmond Becquerel, Poitevin, and Saint-Florent, an interesting point would be cleared up. The discoverer is able to select the sample of red chloride which gives the best results, because of his antecedent experience; the reader who wishes to try for himself does not know by which of the numerous methods of preparing the new chloride he is likely to get the best promise of good heliochromic results.

This coloured chloride will probably help to give a true theory of full printing upon ordinary albumenised paper, but where is its link of connection with the nature of the latent image? How do its properties explain the experiments of Dr. Janssen, of Paris, who obtained three or four reversals of the invisible image successively upon the same film? How do its properties explain Mr. Carey Lea's own noted experiment of the past, of the image upon pure iodide of silver dying out again and again during a rest in darkness, and afterwards leaving the plate ready each time for a fresh impression? The two last questions I have several times put straight to the advocates of the chemical hypothesis of the latent image, and have never been able to obtain a straight answer.

We hear much talk about suboxide and subchloride of silver, but nobody has yet been able to produce a sample of either which chemists as a body will admit to be such. Dr. Hodgkinson does not believe that his production is subchloride of silver, but a salt containing oxygen; possibly it is the same chloride that Mr. Lea has manufactured.

There will perhaps be some difficulty in getting behind the dynamic hypothesis of the latent image first launched upon the world by the late Mr. Mungo Ponton and myself, which is that the invisible picture is due to modifications of the relative motions of the atom of chlorine and the atom of silver, so that at one portion of the new vibratory swing set up by light their attractions are so weakened that the chlorine can be seized by the developer. This hypothesis readily accounts for the resensitising in darkness of an exposed film of pure iodide of silver, and is the only hypothesis which as yet has in any way been used to explain Dr. Janssen's experiment. It also explains why some parts of the spectrum act more than others upon sensitive salts.

On bromide of silver suspended in gelatine, the latent image may last for months, or in some cases perhaps for years, but analogies of the same nature may be found in the realm of physics.

Some samples of powdered fluor spar temporarily phosphoresce beautifully upon a hot shovel in the dark; put the same powder when cool a second time upon the shovel, and it will not phosphoresce again unless meanwhile it has been sufficiently exposed to light. Here we have the results of luminous energy stored up by some means in powdered fluor spar, without any evidence of the intervention of chemical decomposition. Professor Dewar has stored up the phosphorescent energy of luminous paint spread upon a glass plate, by keeping the plate at an excessively low temperature for days or weeks; on taking it from its frigid receptacle and breathing upon it, once more it begins to shine in the dark until its original normal amount of phosphorescent energy is exhausted. He has facilities at the Royal Institution for producing the extremely low temperature necessary, as there are appliances on the premises by which even oxygen can be liquefied by intense cold and pressure. An analogy upon a large scale may now be given. Suppose the earth to be an atom of chlorine and the sun an atom of silver, and their present relations in the matter of distance to be normal. At the present time the elliptical orbit of the earth is so nearly circular, that if it were to be drawn to the reduced scale of a yard in diameter upon the wall, it would be necessary to measure it for the observer to make sure that it was not a true circle. Because of the perturbations set up by the planets, it at times assumes a very elliptical form, so as to give the earth a short, blazing summer and a very long, cold winter; indeed, this furnishes the foundation for the hypothesis most popular with astronomers as to the cause of the glacial epochs. It takes many thousands of years for the orbit to change from its most circular to its most elliptical form, and in the latter case, when the earth is farthest from the sun, evidently its attraction by the sun is weakest, and it is more liable than at any other time to be separated from the sun, should any stronger attracting body come near enough. Here then, on a large scale, we have something suggesting that upon a small scale modifications set up by a disturbing force in the relative motions of two adjacent particles of matter may possibly last for an exceedingly long time. In intermolecular motions there may sometimes be small tendency when a change say, in merely the plane of atomic vibrations is set up, for the particles to return quickly to their normal positions.

The established discoveries of modern science in relation to molecular physics cannot be excluded from photography, and as atomic motions invariably underlie and precede chemical changes, they must be taken into account in any chemical, physical, or other hypothesis of the production of the latent image by light.

THE EXHIBITION DEPARTMENT.*

George Mason & Co.'s exhibits, which were the most extensive in the rooms, embraced many new and useful pieces of apparatus.

One article that gained general attention and approval was a beautifully finished camera arranged to take plates 24 x 24 inches and downwards, with appliances for drawing out and swinging, also for

* Continued from page 445.

carrying the various sizes of plates, that was really the perfection of simplicity. This camera is specially constructed for studio work, and draws to about six feet. In these days, when large direct pictures are being shown in every exhibition, and a demand for them seems gradually growing, this camera will be hailed by all workers in this field as a valuable introduction. Other improved forms of studio cameras for smaller sizes of work were exhibited, and all were constructed for the best effects being produced by the simplest means.

We have before noted Mason & Co.'s new automatic stand, which gained such praise at the Derby Convention. It was shown at this exhibition and fully appreciated.

The Mason & Co.'s "fixing" and "alum" grooved troughs were also on view. The value of these troughs is so widely known to the profession now it is needless here to descant on their virtues. England's print washer and washing machine, that was familiar to the trade some ten years ago, has been again introduced by this firm, and we think wisely, for it is a good machine, and it will be found of great value to amateurs, who have often but a few prints to wash at a time, as we see Mason & Co. have introduced quite small sizes to suit their requirements. We saw in all the various sizes the zinc vignettes we had occasion to notice some time ago. They are very nicely finished, and in many cases must be preferable to glass.

Dark-room lanterns of every style and pattern conceivable were shown by them, in cloth and in glass, for candle, oil, or gas—something to suit everybody. Tourists' cameras of every description—their usual make and finish, with which the profession are quite familiar, and which have always been in the front rank of photographic manufacture. Roller slides (various forms) were shown on their table.

In these days of developed prints we noted a special tray made of *papier maché*—not the usual jointed corner tray, but one pressed out in one piece; we saw them there from the smallest size up to 34 × 27 inches. This, we think, has been a felt want for a long time, and will be welcomed by many. Ebonite trays and glass developing trays were also shown.

Some cut-out show mounts with hand-painted artistic patterns were exhibited and much admired.

We also visited the Accessory and Furniture Warehouse belonging to George Mason & Co., and situated in Hope-street. Being crowded out with stock in their own premises, 180 to 186, Sauchiehall-street, they have opened this Hope-street warehouse for the showing of accessories only. Such a varied collection of tables, chairs, stairways, rocks, vases, rustic sets, stiles, tree stumps, backgrounds, grass mats, carpets, curtains, &c., are not to be found in any photographic warehouse within our knowledge, and require to be seen to be believed. The newest, and best, and latest accessories are to be found within its walls.

We have but to repeat what we have said on a former occasion—it is always a pleasure for us to wander through George Mason & Co.'s warehouses, for they are ever to the front in securing novelties, and something new is always cropping up at every turn.

CONVENTION JOTTINGS.—III.

(From our Special Correspondent.)

WHEN the business of Tuesday was over it was a sight to see the company of photographers from all parts congregated in Cranston's "Waverley" smoking room, gathered into little knots, each party thrashing out their own pet subject, formula, or process, in the best of humours, and all going merry as a marriage bell.

On two former occasions has this same room been in much the same crowded condition with professional photographers. The first time was when Lambert came round selling and demonstrating his carbon process, and the other was when the British Association held their meeting in Glasgow. This Convention meeting, however, far surpassed these, both for numbers and as a representative gathering. As I sat in this room, listening to the hum of many voices, the air was filled with the tag end of speeches, in which roller slides, films, plates, paper, and gelatine, got sadly jumbled up, whilst some of the weary ones were snoozing away quite comfortably on the cushions in the corners of the room, unconscious of the noise—sufficient unto them had been the pleasures of the day, and they were making ready for the morrow.

There were two trips on Wednesday, the 6th—one under the conductorship of Mr. John Stuart, up Loch Lomond to Tarbet, at this point crossing the hill to Loch Long, returning home by the Clyde. This party had a very enjoyable day, the weather being all that could be desired and the scenery very charming. One of the members had a very innocent practical joke played upon him during this trip. The mountain air being too strong for him, he fell asleep on a seat on deck, when a wag of a photographer exposed a plate upon him, and all unconsciously the sleeping one saw himself projected on the screen in the evening, much to his own astonishment and the innocent mirth of his fellow travellers. The influx of the camera men at the head of Loch Long caused a considerable stir at the hotel, where dinner was prepared for them with all speed. When the dining room was filled five of the party unaccommodated retired to another room, where they enjoyed themselves right well up to the sweets appearing, which were served in so small a quantity that one facetious fellow took out a magnifying glass, and applying it to the dish tried to enlarge the contents, whilst another handed him a saltspoon to divide it, so that it might not be served out in too large quantities. All returned home highly delighted with their day's outing.

The other trip was by the steamer "Vanguard," which had been specially engaged and arranged for those photographers who desired a day's instantaneous work—the Largs Regatta being the scene of operations, and the ostensible business of the trip to follow the graceful white wings and catch them on our plates as they speed through the bright rippling waters. Luck favoured us, for amongst the yachts to run were the "Thistle" and the "Irex"—the renown of the former of these being now world-wide. You can understand that such a chance as this to get pictures of her was hailed with great glee by all the company, amongst whom were many notable men.

This trip was under the conductorship of Mr. George Mason, and Mr. T. N. Armstrong kindly undertook to manage the arrangements for sailing, slowing, and stopping at the various points which would give the friends the best chances for exposures—and this part of the work was done to perfection. It may be stated, without fear of contradiction, that all got their fill of yacht-taking during this trip, for no less than 318 exposures were made, the results being yet unknown.

After the races were over we had a little leisure, when groups of the company were taken by Mr. A. Seaman, of Chesterfield, and Mr. Russell, of Kirkwall.

Then an impromptu concert was held on deck, where a very happy hour was spent by the collected visitors, when the following gentlemen favoured the company with songs, &c.:—Mr. Pringle, Mr. Crooke, Mr. Armstrong, Mr. Fry, Mr. Mason, Mr. Henderson, of Perth, Mr. Browne, of Paisley, and others.

During the day Mr. Turner, of Gourack—an enthusiastic amateur, who, like M'Pherson at the Flood, was cruising about in a boat of his own—took two negatives of the "Vanguard" and her photographic cargo.

At the evening meeting a telegram was received by cable from Mr. Charles Gentilé, of Chicago, as representing the Photographers' Association of America, wishing the United Kingdom Convention all the success that could be desired, which was received with acclamation.

ON THINGS IN GENERAL.

JUNE and Jubilee, July and Convention, are the catchwords of the present and the past month, and equally fateful to photographers. I have been trying to calculate how many Jubilee negatives are likely to have been taken on the famous day, but am lost in a maze. There are quite a number published; but most of what I have seen are very mediocre sort of affairs altogether. One reads on the outside of the boxes of plates one purchases "thirty," "forty," "sixty," "times the rapidity of wet," and on others, "special instantaneous," and so on *ad nauseam*, yet the Jubilee results, with such asserted rapidity before us, do not, taken as a whole, show anything very greatly exceeding the results achieved on glass thirty years ago, or on silver plates years before that. How can this be satisfactorily explained? Very few makers admit their ordinary plates to be less rapid than "thirty

times wet;" yet there are few professionals whose average exposures are below, say, three seconds, and this with a thirty times plate would represent an average in former times of ninety seconds, which is absurd. Let us work the question the other way. I do not think I can be wrong in giving thirty seconds as a very high average of wet plate work in the days when were produced the negatives whose abandoned beauties M. Davanne so deplors; nor is three seconds, I am sure, by any means an unfavourable estimate as regards the rapidity of the dry plate of the period. That gives "ten times," rather than "thirty," or the apocryphal "sixty," that characterises so many plate box labels at present. It has been asserted that for very quick work gelatino-bromide does not exhibit so great an increase of rapidity over collodion as it does with more ordinary exposures. I will not pretend to offer a reply to such a question; but the fact remains, as I started by saying, the Jubilee pictures of any merit that have come under my notice do not exhibit traces of extremely rapid exposures.

Do these pictures sell, I wonder? or does the average photographer take such subjects as a matter of course because they are curiosities and part of the things he is supposed to take as a matter of course?

It is no doubt exceedingly probable that photographic representations of incidents connected with the present Jubilee celebrations will fetch a large price on the next Jubilee day; but the photographer of these times does not generally work for the benefit of posterity. I have an idea, though, that whenever a crowd of people is photographed successfully, nineteen out of twenty of those who are plainly recognisable in that crowd are seized with an irresistible desire to possess a copy. A photographer of my acquaintance who was smitten with the general photographic fever is a disappointed man. He got an excellent photograph of an immense crowd, but he says no one will buy—there is no expression in any of the figures; the truth being that nothing but hats and sunshades are visible, and there really, when one comes to think of it, is not a wealth of expression in a hat.

Passing on to Convention matters, I have to say that if the Jubilee did not prove to be of much benefit to photographers, there are very few who would not be benefited by a perusal of the papers read at the Convention—papers by some of the best men of the day. Whatever was gleaned by hearing them read, still more may be gained by reading them quietly through, as one can do at one's own fireside, thanks to THE BRITISH JOURNAL OF PHOTOGRAPHY.

Of course, among such a concourse of good things, there must be here a target for a good-natured shot; but I am speaking of the papers as a whole, and I recommend all my readers who have not already done so, to give themselves a good time by a perusal of the Convention utterances.

I notice a humorous paper on *Metrical Measurements*, the writer of which follows a common lead in advocating the use of a decimal system of weights and measurements. My opinion is that the chief advantage of the decimal system is that it is likely to be universal, and so confusion will be avoided; but that it is convenient for general use I distinctly deny, and I believe it to be a fact that in the countries of its legal adoption it is by no means universally employed. By-the-by, what does the writer mean by speaking of the time when, "to all intents and purposes we shall become a bit of Europe?" I thought we were a part of Europe at the present moment.

The genial writer of the paper on *Elementary Photo-micrography* can be followed in his remarks with pleasure, and the account of his experiences in the work will doubtless be of value to any one seized with the mania, and this is ever a very powerfully acting mania when once it has taken full possession. When he says the "finest line that was ever drawn by mortal man is a cable in comparison to the lines that may be produced by photography," he well illustrates the fairy-like beauty of the results; but the word "drawn" must, of course, be understood to mean drawn with a pencil.

In *Home Portraiture* there are some capital remarks, and I would draw especial attention to the paragraphs in quotation marks in regard to the relative positions of body, head, and eye, in portraiture. A very important, and little regarded, subject is there treated succinctly and usefully. One commonly experienced difficulty is alluded to in a way which will give the portrait photographer not conversant with the canons of art a useful hint or two in discussing matters with his

sitters. I allude to the very commonly expressed desire that the "face should be looking at you," that is to say, that the eyes should be turned to the spectator. No photographer would think of putting body, head, and eyes, directly facing the camera, and Mr. Hough's words explain the conditions under which only the required arrangement may be carried out. With head and figure well turned from the camera and the eyes looking into the camera ("three-quarter face, please, and the eyes looking at you"), the effect will be objectionable; but by keeping the body in the same position and bringing the head nearly, but not quite, to full face, the eyes may look into the lens with the most pleasing result. In the former case he says you have an effect of "shyness, coquetry, or suspicion." The old miniature painter from whom years ago I gained many hints in portraiture, used to call the effect a leer, and I think that exactly defines it.

The writer of *Photography from One Point of View*, in one line sums up the one distinguishing characteristic separating the good from the bad, the artistic worker from the mere workman. He says we may in a moment "secure any beautiful effect if we only know how to look for it, and see it when it presents itself." Ah, there's the rub! What man can take a picture in the true sense of the word if he does not know one when he sees it? He is a poor, contemptible fellow who does not work up to a standard of some sort. A truly artistic standard is not and cannot be erected in the mind of every one who owns a camera lens. Let those whose culture is sufficient be thankful that such is the case; were it otherwise, photography as a profession would soon be played out.

FREE LANCE.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

ALTHOUGH the general idea before us is to treat of the many and various ways of applying colour to photographs, there is no reason why, in discussing *portraiture*, the photographer should be considered less than the colourist or amateur. Indeed, we should all try to advance hand in hand, as in the end it is our *united* work that must stand the test of criticism, as well as give satisfaction to our clients.

It may be said that while I jot down a few remarks on portraiture generally, I am not strictly within my rights as defined by the title of these papers; nevertheless, they may be found useful, inasmuch as they will remind, if not instruct, as to the general principles which should guide us in everyday studio practice.

In the production of *cartes-de-visite*, cabinet three-quarters and full lengths, and, indeed, in all sizes where the figure is shown, there is considerable tax upon the art knowledge of the photographer before he will secure a successful picture. There is much more scope in these phases of photography to exhibit the operator's skill and knowledge as regards arrangement and composition than in any other. By this I do not mean to convey, however, that there is little or no knowledge required to pose a head and shoulders satisfactorily. On the contrary, there is a very great deal of artistic knowledge and feeling required to secure that turn of the head which will give it importance as well as endow it with intellectual expression. I may say I know several very successful photographers who make most excellent pictures when engaged on subjects showing the entire figure; they show consummate skill in the lighting, also in the adjustment and general arrangement of the draperies, yet when they take a head and shoulders their pictures are ordinary to a degree. They are photographs simply, without that artistic touch and feeling which alone can entitle them to be called portraits. It would not be fair to mention names here, but there are two or three photographers in London upon whose work (I mean as regards head and shoulders more especially) I have always dwelt with great pleasure. The artistic feeling, possessed to no small degree by the operator, has been visibly secured upon the faces of their subjects.

At the outset it may be just as well to consider what is and what is not a *picture*. The mere reproduction of an object or the exact delineation of a face, although granted it be a likeness, will most certainly not constitute a picture. No, there is much more than this necessary. In order to produce a really good portrait, and at the same time endow it with those qualities which alone can make it a pleasing picture, the subject being treated should be represented under such

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conditions as regards position, general arrangement, light and shade, appropriateness of surroundings and accessories, &c., as will unfailingly indicate character, endow it with true intellectual expression, and yet at the same time lend themselves to the general pictorial effect.

The photographer must always labour under a very serious disadvantage, inasmuch as he can never, personally, have absolute control over his models, either as regards their facial expressions or, to a great extent, the varying effects of light and shade, which he would wish to secure in his models, this notwithstanding he may possess considerable taste and general knowledge of art. However, much can be done towards the production of a picture that will not only be such but also be a good portrait. The operator can always, at least, select his positions, to a very great extent control the general influences of light and shade, and so secure the most pleasing and characteristic lines and features of his models; by the judicious and thoughtful selection of his accessories, and the artistic arrangement of same, he is enabled to do away with harsh lines that otherwise might exist and so mar the beauty of his work. With the liberal use of accessories, too, which nowadays seem quite customary in photographic portraiture, tone or colour can be given to portions of a picture where same may be desirable; but care should be taken, all the same, that all such aids should tend to produce artistic simplicity, general harmony, and a feeling of breadth in the finished picture.

In composing a picture, more especially when the figure is to be shown full length, one of our most important considerations is the selection of a position. Character, as well as general pictorial effect, depend greatly upon the success of our choice in this matter. There is, still further, another point to consider, even when the position of the model is successfully fixed upon, and that is the position it shall hold in the picture itself. This may not appear a very important point at the first glance, but a very little consideration will show that it may be of vital importance. The figure should I may almost say *never* be placed in the middle of the picture, that is to say, equidistant from each side; there is no position more formal or destructive to pictorial effect than such a one. As a general all round rule, it may be accepted that more space should be in front of the figure than behind it. Of course this disposition may be rendered unadvisable owing to some peculiarity in the arrangement of the surroundings. This one's own artistic feeling will easily point out. If a lifelike appearance should be secured for a figure in a picture, and the semblance of motion almost visible, it is more pleasant to feel that the model is walking *into* the picture than retiring out of it. This is one case where the slight advantage of space before the figure will prove an advantage. The same idea will be found applicable, but for another reason, as regards the position of the figure being equidistant from the top and bottom of the picture. I think the latter is more important even than the former, and much more destructive of truth and pictorial effect not properly considered.

By the distance from the top and bottom of a picture can we alone fix an idea as to the height of the figure represented. The nearer the head is to the top of the picture, the taller the figure will appear to be; the lower the head is, the shorter will be the appearance of the subject. If you take, for example, an officer in the Life Guards, and you want to give him the appearance of height (and there are many, by-the-by, who require it), select your accessories such as pedestal, &c., rather low (some have accessories expressly for the purpose), and cut the picture so as to place the head near the top of the mount, and your effect is at once gained. As I said before, full length first, then three-quarter length figures, demand most attention from this point. In larger portraits, especially head and shoulders, it is not so necessary a consideration, but should, nevertheless, *always* receive our best attention. Thus a bust, say, in profile or even three-quarter face, should have more space before than behind, while a similar figure presenting a full face may, without being in the least inartistic, be placed in a position equidistant from both sides.

The various positions in which the human figure may be placed may almost be considered limitless, but every one should aim at securing grace, ease, and character—a result seldom arrived at the first time of asking. An operator wishing to secure these qualities in his pictures should always have an object or purpose reflected in the position he selects. This does not necessitate that the sitter or model should be absolutely engaged in any particular action or occupation,

but that due attention be given that the expression of the consciousness of being photographed, or that of complete vacancy, be not depicted upon the features of the same.

In ladies' portraits it should be easy to give action or intention to one's models—reading a letter, arranging flowers, gazing upon a picture, &c., may all be adopted at the operator's will. In portraits of gentlemen these occupations would not be so happy. However, others are at our disposal, and even the very conventional "book in one hand" may be adopted, but not necessarily in the conventional manner, but with expression and purpose.

Some approve of entire repose; I have nothing to say against the same when it is what I may be allowed to call an "intellectual repose." In this, however, there is a danger of producing the appearance of vacuity, which of course would mean ruin to a portrait both as a likeness and as a picture. Straight lines and angular positions should be carefully avoided in all cases; there is much more of the ugly than the beautiful about them. There is a great deal of skill required in this regard, and I have known some sitters who have defied some of the very best operators to secure them in graceful positions, but, thank Providence, they are not very numerous. The human figure in a perfectly upright position is not at its *best*, although perhaps at its *highest*. It lacks grace in a man, and is absolutely awkward and almost offensive in a lady. The figure may lean slightly against any article of furniture, such as a high-backed chair or screen, or in any manner so as to induce a slight inclination, and thus secure curved and flowing lines both for the figure and the drapery.

If the figure be standing, a more perfect feeling of ease and balance is secured by making the weight of the body rest upon one foot rather than upon both. It is very difficult indeed to secure ease, not to say elegance, and at the same time rest the figure equally upon both feet. All action, or suggested action, that may be sought for in a model must never be attained at the expense of ease and grace. In the suggestion of an overstrained muscle or a dislocated limb the most skilful artist will fail to depict a grace or secure a pictorial effect.

When we come to a question of composition it will be well to keep before us the axiom that the most perfect and beautiful effect to be gained is simplicity. Over elaboration or complexity is most objectionable in portraiture at any time, but in photographic portraiture it is more strikingly so. It is most important that a perfect balance, both as regards lines, and light, and shade, should be secured. In the study of the works by Sir Joshua Reynolds, or any of our famous old portrait painters, the student will be struck by the graceful tendency of all the lines as well as the simplicity and unpretentiousness of the colouring. Yet what beauty! You never find all the lines in a picture running in one direction, the effect would be harsh; nor do you find a picture badly balanced by having all the masses accumulated in one corner of the picture, leaving the rest bare and unsightly. This is a more important consideration perhaps for the photographer even than the painter, for the latter can, by the aid of colour, create a balance where the "one tonedness" of the photograph would only accentuate the faultiness of such a composition. REDMOND BARRITT.

(To be continued.)

ACCESSORIES OF THE LANTERN.

CHAPTER X.—JET FITTINGS.

THE usual shape of the lime is a cylinder, about an inch and a half long and three-quarters of an inch in diameter. This cylinder is perforated by a hole one-eighth inch wide in the line of the axis, which allows it to be supported upon a brass or iron pin placed in front of the jet nozzle. The distance between the point of the nipple and the surface of the lime may be an eighth of an inch with mixed gas jets, the area of incandescence being a circle varying from a quarter to five-eighths of an inch in diameter, according to the force of the gas supply.

Jets of large aperture cause a pitting of the lime similar that caused by small apertures; the pits or depressions are wider in the former case, and it is sufficient—with a hard lime—and a moderate gas pressure—to partly turn the lime by hand once in ten minutes. If the lime remains stationary for a longer period than this, a deep depression will be formed and the flame may be altered in direction in

such a way as to put the condensers in danger of being cracked by the heat; besides this, the light is not so good as when a fresh surface of the lime is presented to the action of the burning gases.

The employment of clockwork to cause a slow revolution of the lime is a very old contrivance, dating from the first introduction of the limelight. There are special clockwork movements supplied by opticians for use in lanterns, which not only cause the lime to revolve but also produce a motion in a vertical direction, so that the flame acts on a spiral or corkscrew path round the lime. I have had some experience with these movements, having applied a set of three American clocks to a triple lantern. The clocks had loud-ticking watch escapements, and when all three were at their appointed work—turning the limes under the influence of strong mainsprings—the effect was such as to induce those members of the audience who were nearest to the instrument to glance at it in wonder, and remark that it seemed to be alive, especially if a jet happened to chime in with the music by hissing or roaring a little, owing to a high pressure of gas.

The clocks were accessories that required oiling occasionally besides winding up, and the top one of the three, owing to the heat, was apt to get out of sorts and required careful supervision. Doubtless with a single lantern the stopping of a clock would be noticed immediately by the cessation of the ticking noise, but with a triple, the resting of one seemed to induce the others to tick with increased energy, and so the total sonorosity was the same as before. The clocks had another fault—they failed to sound an alarm if a lime happened to fall to pieces, the result being that a lime pin occasionally was melted down to a very short stature. This compelled the operator, in order to keep his mind at ease, to glance every five minutes at the machinery inside the lantern, and the notion eventually occurred to him that the clocks were false friends, as it would be just as easy for him to turn the limes by hand once in ten minutes, as to keep the necessary watch on the mechanism. So the clocks received notice to quit: they gave up their posts, and have never been recalled since.

There are two ways of turning the lime without opening the door of the lantern; one is to have a pair of small cogwheels, with bevelled toothed edges, working at right angles to each other, the other method is to connect the upright lime pin by a coil of wire with a horizontal pin having a brass button at the end to turn it by. Each of these plans answers its purpose well, provided the teeth of the cogwheels are kept free from grit, and the coil of wire is not softened by the heat of a jet in a lower position, as in a biennial. The up and down motion is usually given by putting a screw thread on the lime pin, and a corresponding thread on the small brass disc that supports the lime. This is a very defective method, as the lime dust gets into the threads of the screw and causes the action to be very stiff. It would be better to have the up and down motion entirely distinct from the revolving action; the former is not absolutely necessary, as if the flame strikes the lime at the lower portion it is easy, by turning the lime upside down on the pin, to ensure the upper portion being also acted upon. Simplicity is a great virtue in lantern apparatus; on this account I prefer to have no cogwheels and wire helices in a biennial, as the opening of a door does not send the flood of light into the room which occurs with a single lantern. The lime pin may be a brass wire one-eighth inch thick and two and a half inches long, at the bottom of this is fixed a disc one inch diameter, with a rough milled or toothed edge, which enables it to be turned by a touch of the finger. Another brass disc, half an inch wide, is soldered on the pin one inch from the top; the lime rests upon this disc. The pin is held loosely in a brass tube one inch long and three-sixteenths inch bore; this tube encircles the pin between the discs, and is itself supported by a curved arm hard soldered to it, and clamped to the jet tubes.* This lime support cannot well get out of order, and I can recommend it as simple and efficient.

The tin trays which formerly were always employed to support the jets are now less frequently made; it is a much better way to have an upright iron rod, three-eighths inch diameter, permanently fixed at the back of the lantern, to which the jets are clamped by strong thumb-screws. This rod should be firmly fixed at both ends in such a way that no twisting motion is possible; a bearing in the middle is unnecessary in a biennial, as it is an advantage, after an exhibition, to be able

* The lime pin has a little play in a vertical direction, and is retained at any height by a spring which presses it against the sides of the encircling tube.

to slacken the thumb-screws, and allow both jets to slide down the rod to the bottom of the lantern, leaving the interior empty and available for packing away slides, &c. This can be done without having to pull the rubber tubes off the jets, if the former are properly arranged.

With a mixed gas jet, it is immaterial which tap is used for oxygen; it is well, however, to have a uniform system for use with all jets. One particular side, such as the right-hand one, should be devoted to oxygen, and the other side, or the left-hand stopcocks, to coal gas. This will prevent hesitation when a readjustment of the taps is necessary.

Some operators are inclined to give the preference to a single lantern, rather than use a biennial. With such methods of changing the pictures as are adopted in lanterns now procurable from opticians by which an instantaneous change takes place without apparent motion of the image on the screen, it is easy to understand this choice. A biennial is the best instrument for general lecture exhibitions, as there are very few effects that cannot be shown by it. A triple lantern is more ornamental, perhaps, than a double, but this does not compensate for the extra weight, complexity, and expense; the third lantern is often not used at all in exhibitions. The chief fault of single lanterns has hitherto been their inability to show the dioramic effects which require two pictures to coalesce and form one view, and also to change ordinary views in a pleasing manner. The latter defect is now practically overcome, and by using special slides it is quite possible to show most of the usual dioramic changes with a single lantern, such as day and night effects with windows, &c., lighted up; swans swimming on the water, with bending necks, as in the "mill" effect; the flash of forked lightning; the rainbow, and certain others. The "rolling curtain" method of changing slides can be as perfectly and easily accomplished with a single as with a double lantern. There is a very effective way of showing statuary views by first projecting on the screen a gorgeously decorated curtain, which appears to roll up and disclose the white marble behind—this effect lies within the domain of the single lantern, which I expect will be the "lantern of the future" for general use. ALBERT WM. SCOTT.

NOTES ON PHOTOGRAPHY AT SAN FRANCISCO.

THE thing amongst things photographic that I have seen here that has interested me perhaps more than others, is a series of large Daguerreotypes of very good quality showing the bay in 1851. These Daguerreotypes hang in the rooms of the Amateur Photographic Association of San Francisco, and are interesting because they illustrate a bit of history. In this year (1851) the "gold fever" was at its height. In all parts of the world people in all positions of life were casting aside their employments, leaving their homes, their friends, and all ties, and were rushing, like beigns possessed, to the newly-discovered gold fields. Ships arrived at San Francisco from all quarters of the globe, and immediately they set anchor in the bay men deserted. Not a sailor or hand on them but what caught the fatal fever, and sped inland to the diggings. A man could not be hired for twenty dollars a-day, and the ships had to be left to rot where they first dropped anchor. The Daguerreotypes referred to showed the hulks lying on the waters in various stages of disintegration. On the hulk of one ship is painted up in large letters, "Store," the owner, or his representatives, having evidently become resigned to the idea of letting her rest where she was.

It appears that the part of the bay where the greatest crowd of ships show in the old photograph has since been reclaimed—has been filled in, that is, and has been built over. Recently, some rebuilding was going on, and the excavations came right on to one of the old hulks. They were never removed, but the earth was filled in around them: they were literally buried.

Rough times those of the gold fever must have been. I imagine that but a small percentage of those who made so wildly for the diggings ever came back again.

Talking of rough times reminds me that I have seen, since I have been in America, two photographs of "lynchings," or rather of the hanging bodies of the victims after the lynchings were over. Repulsive enough looking pictures they are. In one case the body is seen hanging from a set of shear-legs, apparently erected for the purpose of the execution; in the other it hangs from the cross-bar of a telegraph pole. In each case there is a crowd of men underneath who have an expression of cheerful satisfaction—on account of their own superior virtue, doubtless.

It was my impression that this sort of thing had died out, even in

the extreme West; but it appears it has by no means done so. I took up a local newspaper a few days ago, and saw in it that an attempt was being made to seize two negroes out of one of the state prisons to lynch them, and that if the attempt were continued "bloodshed would certainly ensue." The object of the lynchings is not very evident, for it appears always to be some criminal who would be hanged legally in any case who is selected. The excuse is that it is done to prevent a miscarriage of justice; but it seems to me that more of the brutal element, which is always ready to rise if it be not kept under, is in the thing than anything else.

In the gallery of Taber, an eminent photographer here, I saw a series of photographs taken from a balloon, which struck me as the best thing of the kind that I had seen. I send prints of them, in hopes that they may be considered good enough—some or all of them—to be reproduced. The following is a brief account of the trip given to me by E. H. Husher, who made the ascent and the exposures.

The ascent was made on the 15th April at 10.50 a.m., being organized by the *Daily Examiner* newspaper. In the balloon were a representative of that newspaper, a professional aeronaut, Professor Van Tassel, and the photographer already mentioned. The greatest elevation reached was 2000 feet, and there appears to have been some difficulty experienced in preventing the balloon from drifting out to sea.

The camera used was 10 × 8 size, and it was fixed on a swivel arrangement over the edge of the car, which enabled it to be directed at any angle with the perpendicular. Twelve plates of American make were taken, a No. 3 Eurycope lens was used—precise focus not known to me, but long for a 10 × 8 plate—and the exposures were made by the aid of a rapid double action shutter.

From the twelve plates six good negatives resulted. Husher noted what has, I believe, been observed by all who have made attempt at balloon photography, that there is great difficulty in getting contrast in the negative. This is due probably to lack of any deep shadows (the *under* sides of all objects being of course hid from view, and every point seen being illuminated at least by the whole sky) and also to somewhat of land mist.

On the fact of the difficulty in getting contrast, the *Examiner* representative, in his account of the trip, enunciates some truly wonderful theories as to colours and paintings, heading his remarks, *Important Discovery—The Application of the Theory and Proof of the Theory*. Husher, however, noted that, although very deep shadows nowhere existed, the contrast of colour appeared particularly vivid, and he anticipates that by the use of orthochromatic plates, which register a greater range of colour than ordinary, he will be able, when he makes his second attempt, which will be soon, to get results still better than he has. This appears likely, the whole of a balloon view corresponding somewhat to the *distance* in a landscape, which distance, as is evident from the result of recent experiments, is better rendered by orthochromatic than by ordinary plates.

Some difficulty was experienced in landing, Husher contriving to get out of the balloon on the top of a tree with his plates unbroken, with the natural result that the balloon, with its two other occupants, bounded into the air again, and only landed for the second time at a considerable distance.

W. K. BURTON.

HOW TO PREPARE GELATINE "POSITIVE" DRY PLATES.

II.

RECENTLY it has been advocated that a film rich in silver salts is necessary to give the best result on the modern positive. This is contrary to my experience. I have tried various proportions of salts, from the maximum amount used for negative plates, downwards to about ten grains per ounce, which undoubtedly gives the most uniform and brilliant result. To support this conclusion, the following facts may be adduced. The effect of reducing the salts in a negative plate, as is well known, is to deprive it considerably of its detail-giving quality, and this is the object necessarily desirable to a certain extent in the so-called positive; and it surely occurs to one that the action of light through the camera is precisely the same for the positive as the negative, namely, to reduce most where the light has been most intensely reflected from the object. Now, if the positive plate were as susceptible to the weaker reflections as a negative plate, nothing but a clouded, misty-looking result could be obtained; therefore I think it is clear that a film poor in silver is the most favourable condition to give the brilliancy essential to the glass positive or tintype, since we see that abrupt crisp shadows and prominent lights are the ruling features characterising a positive effect. The positive (figuratively) so called is but a thin, hard negative, having an approximately white film. The designation "positive" was given when the discovery of taking photographs on glass was made in the primitive days of photography, owing

to their showing as a positive when viewed by reflected light. It is not for me to dispute the descriptive name; the excuse for briefly noting this is to point out the true nature of the reduction on positives taken through the camera, as it may save a little thought to those who take up their preparation. Nine-tenths of my exposures for glass positives and ferrotypes were made by contact against a transparency—this mode is not advisable for experiment, although expeditions. Granting that the minimum of silver affords the best condition for brilliancy in the positive, it may be useful to dwell further on the care needed in emulsification to prevent its giving the wrong colour when developed, as briefly stated in last paper.

It is apparent that emulsification will go on more rapidly when a small proportion of silver is used than if a larger be employed, and especially when there is also less gelatine present than is usual for negative plates; the emulsion being more aqueous, convexion would make a more rapid interchange in the particles, thereby accelerating the emulsification, one hour perhaps sufficing to bring about the same degree of homogeneity or fineness of division as four or five in the case of an ordinary emulsion. With this in view, it is manifest that any increase in temperature would further control the time of cooking, high temperature producing the same effect in less time as longer cooking at a low temperature.

The addition of sodic sulphite to the emulsion after washing had a tendency to eliminate the yellow colour spoken of, giving a greenish white in its place. This latter colour was preferable to the former, but still necessary to be avoided. The means to the end was found to be in the withdrawal of the sodic sulphite from the emulsion. (This is the ingredient whose presence had to be dispensed with, as spoken of in last paper.)

Taking advantage of the similarity exhibited in the chemical action between emulsification and development already stated, I found that an increase in the quantity of sodic sulphite to the developer had the property of hitting the colour between the yellow tint and the green, which colour is a very favourable white.

It might be contemplated by some, that if one hour at 130° Fahr. be the limit of cooking, that this time ought to give as great rapidity as four or five hours would impart to a negative emulsion; but it is known to those experienced in plate making, as well as to those read on the theory of cooking and percentages of salts therein, that there is not the same surface of silver amenable to light and development; besides, there are special ingredients applied to negative emulsion to give sensitiveness that cannot be introduced in a positive emulsion without destroying the white colour, and, moreover, if there is not as much silver in the film as the gelatine is capable of suspending, it is known how rapidly sensitiveness decreases.

It is clear from this experience that we must choose between two evils, either to sacrifice brilliancy, and perhaps whiteness, for rapidity, or take brilliancy and whiteness at the sacrifice of half the rapidity—say, five times wet collodion to be the greatest rapidity compatible with good quality, and this is just the rather unsatisfactory stage to which it has been carried as regards rapidity, if it is looked on as a great *desideratum*; but supposing the greater part of tintype and glass positive work to be done with Gem and Victoria lenses, the exposure required outdoor is about half a second, in the studio about four to six times that—a period, under favourable circumstances, meaning the best actinic light essential for positive work. It is only in a dull light, as in the case of the collodion positive, that the sensitiveness apparently more than proportionally diminishes according to the decrease in the light. It is well known that collodion positives of the finest quality were only obtainable in the best light, and precisely the same tendency is exhibited in the gelatine positive.

Without further comment here, I give the latest modification of formula, and you may think little of it, as it reads but little different from an ordinary negative formula; nevertheless, this should not detract from its value, seeing that the end sought for is fulfilled. Suffice it to say that, given the conditions of light, apparatus, &c., eleven plates out of every twelve can be produced of uniform good quality, comparing favourably with the best collodion productions:—

Silver nitrate	300 grains.
Ammonium bromide	260 "
Gelatine	550 "
Distilled water	25 ounces.

Dissolve the silver in seven ounces water additional.

The usual methods of compounding are to be employed in this formula, any difference being in the treatment after washing; but to make the instructions more intelligible, the methods practised are here given. Soak the gelatine in the twenty-five ounces of water for five or ten minutes, dissolve at a temperature not above 130° Fahr., add a quarter of an ounce of absolute alcohol to the liquid bromised gelatine immediately before adding the silver.

The silver solution must be added in small quantities, with shaking on each addition. When compounded, return the bottle to the hot-water bath, and note that the temperature in the emulsion does not exceed 130° Fahr. Now allow it to cook one hour at the said temperature, after which pour it into a dish to set, then disintegrate the set emulsion, and wash in the usual way to remove the by-products. After draining the water from it, return it to the hot-water bath, and redissolve at a temperature of not more than 120°. The treatment now following is supposed to take an important part in giving the white film. Apply two drops hydrogen peroxide diluted with one ounce distilled water, and be careful not to heat above 100° until after the hydroxyl is added, and even then not more than 120°. This caution about the temperature in this operation is of vital importance, because it is known that heat decomposes the H_2O_2 into water and oxygen H_2O and O , hence the importance of low temperature at the moment of application. Once incorporated in the emulsion, I expect the function of the hydroxyl is to give up the atom of oxygen when in the nascent state to the silver salt, thereby altering its character and rendering it more amenable for a white deposit when developed.

So insignificant is the change from an ordinary emulsion, namely, the reduction of the salts and addition of hydroxyl, that it looks fit only for the credulous to accept; nevertheless a moment's reflection will remind us that similar improvements in photography have been characterised by apparently as simple modifications, and if the end is fulfilled, no matter how simple the means adopted. Of course the white film is not to be attributed to the modified emulsion alone, the constitution of the developer claiming half the credit of giving a white reduction. Much has been said lately about bleaching or whitening the film after development. Any attempts in this direction have not been very fertile in my hands. In fact I have not been able to get mercury, salts, or iodine to improve them in the slightest degree. Such treatment is surely superfluous, seeing that a film as white as a collodion positive can be got with simple alkaline pyrogallol.

As to the time occupied in manipulating them it can be even less than for negatives; fifteen minutes being ample for exposure, development, and drying. The white of the collodion positive is different to the gelatine production, the collodion showing a steel-white hue, while the gelatine has a warmer white, more of a straw colour: the latter has been appreciated quite as much as the steel-white of the collodion by old hands. No new departure can be successfully worked at first, not even by experts; one must be reconciled to spoil a few. Such failures serving to give a better knowledge of its character to the observing mind often leads to better success in the end. Considering this, the operator must not give up till rewarded with success, for they are just as simple as collodion positives, once the details of manipulation are understood.

Up till now we have been speaking mostly of glass positives, and it is needless to say that the same emulsion holds good for the ferrotype, as also does the same treatment in development; but it may be useful to dwell a little on the manner of coating the ferrotype plate. It was on account of the difficulty in coating the iron plate that I was compelled to try the glass positive; however, the method employed for coating the tintype may be accepted for what it is worth. Any of the plate or paper coating machines might be easily adapted for such a purpose.

Perhaps a description will sufficiently convey the idea without a sketch, and save considerable valuable space. Suppose two light wood frames, like the frame of a slate, hinged at the side, one frame being half chequed on the inside to allow a glass plate to rest therein, the other frame having a ridge of indiarubber glued to its inner edge so as to fit on top of glass plate round the edge where it rests on the half chequed part of the frame. It will now be seen that if the ferrotype plate be laid on to the glass plate, and the upper frame brought down or closed on it, that the indiarubber will press the iron round the edge and keep it flat on the glass till coated and set; a small hole is cut at level of the plate at one corner of the frame to allow the surplus emulsion to be poured off. This was the best means tried to coat them, but it was attended with much waste, due to their buckling with the hot emulsion. But no doubt a means of coating economically can be devised if a machine of the type used for coating paper do not answer. The usual method of coating negative plates applies equally well to the glass positives. Perhaps a heap of ambiguity about the theory of chemical action giving the white film has been advanced, and it may be prudent to simply give the formula for development and instruction how to use the same, without setting forth more such hypotheses, although it may be granted that trying to account for the reasons why may be of service to help further investigation. This is the plea for such speculations.

To get the best result on a positive the lighting has to be somewhat

different from a negative. First note that you have a very intensely contrasted white light, in order to get clear glass in the shadows; the time of exposure has already been specified. Development proceeds in the usual manner, only perhaps greater precision has to be observed in carrying it to the proper limit. The film being white makes detail difficult to discern, although a very much brighter light can be used. The developing formula, like the emulsion one, is but little different from an ordinary pyro developer, and consists of the following formula for development:—

	A.	
Pyrogallic acid		10 grains.
Water		10 ounces.
	B.	
Liquor ammonia, s.g. 880		4½ drachms.
Ammonium bromide		2 "
Sodic sulphite (pure)		2 "
Water		20 ounces.

In addition to the sodic sulphite, carbonate and bicarbonate of sodium has been used in the developer as before mentioned, but recent experience has shown it to be superfluous; quite as good a white is got with the simple formula alone. The important object to be noted is in the balance between the pyro and ammonia solution; unless the proportions are accurately weighed and measured as specified, and the right quantities of A and B mixed together, the best white cannot be got. It is therefore to be emphasised that the developer must be regulated thus: Use for a quarter-plate four drachms of pyro solution to six drachms ammonia solution. Mix immediately before using. The image will appear in some time as a negative image. Continue development till the deepest shadows only show white un-reduced bromide. If the light used be intensely white equal parts of A and B will give an excellent white. Fix in a freshly made weak solution of hypo soda; a small quantity of sodic sulphite may be added to hypo with beneficial effect, say one drachm in a pint of the hypo solution. After fixing wash three minutes under the tap, then immerse in spirit having a small percentage of tannic acid therein. Again rinse under tap, after which dry in the oven used for collodion positives, the tannic acid having fitted them for such treatment.

Let me hope that your readers will be unbiassed at such a lengthy contribution on this subject, and that it might be permissible on the ground of its original nature, also that it may be of utility to our photographic brethren.

JOSEPH GRAY.

PHOTOGRAPHIC EDUCATION.

THE excellent endeavours made in many quarters to render the next generation of photographers in some respects an improvement upon the present do not, it seems to me, arouse that amount of interest which the undoubted importance of the subject demands. In fact, I am free to say that few, if any, of what may be termed the outside photographic public have any inkling of the extent to which posterity is being placed under an obligation; and I am strongly of opinion that lots of us who imagine ourselves to be well abreast of the times have only very hazy ideas about the matter. In particular, I must confess to being disappointed with a recent article on *The Education of the Children of Photographers*. I was led by the sound of the title to expect something of a profoundly instructive cast; but discovered that the writer simply hovered about his subject in a gay and *débonnaire* fashion which, although productive of bright and agreeable reading, does not, in my view, assist the development of any serviceable ideas in relation to the question, for after following his easy-flowing sentences along their pleasant course, and smiling at the brilliant display of fireworks with which they unaccountably concluded, the only impressions remaining on my mind were that he has little or no esteem for the facilities we possess for educating youths destined to earn their bread as photographers, and that the fine old crusted fallacy that the average middle-class educational *curriculum* of Continental countries is preferable to our own dies a hard death. True, the cost of education in France or Belgium is, or was, less than here at home, and a foreign language is a useful weapon in these days of fierce competition; but having admitted so much, I am unable to allow that there is any professional advantage to the lad destined to uncap upon fashionable beauties in Bond-street or Regent-street, or greasy provincials in Euston-road, from a scholastic training under alien masters, by alien methods, and possibly in purely alien subjects.

Switzerland, the Germanic Federation, and the Low Countries, are rightly famed for their technical seminaries and the fine craftsmen they send out, but I search the records in vain for the smallest evidence that photography in any of its branches is yet scheduled among the subjects taught at these schools. That being the case (of course I am

open to correction), I must demur to Mr. Harrison's advice in so far as it relates to the acquirement of a photographic education abroad, for the trifling reason that it is difficult, if not impossible, to get what is probably nonexistent, or at least nonapparent. I counsel photographers to avail themselves of the opportunities we possess at home for imparting the necessary technical knowledge to their sons. To show that we have the requisite facilities among us is partly my task on the present occasion.

The sorry sights presented by some of the highly paid leader writers of the Metropolitan daily papers as they recently gushed over the Cellier-Mayall "discovery" must make all friends of enlightenment long for the time when the dangerous gift of a little learning, which those poor gentlemen seem at present to possess, shall have given place to a shred or two of well-grounded knowledge. In the meantime some one might take pity upon them and send them a copy of the expatriated Professor Burton's popular brochure, or one of Abney's forthcoming primers (originally penned for small boys), a diligent perusal of which, coupled with a little sober reflection, will possibly avert the recurrence of the wild blunders to which we are unfortunately growing rather accustomed. In a few years' time the present system—under which commentators upon abstruse matters in technical journals understand what they are writing about, and those who handle similar subjects in the more widely circulated daily newspapers do not—will probably be overhauled. Editors will have passed an examination in at least the elementary chemistry of photography at their universities; or, mayhap, the leader writers will not be handed the reins over roads with which they are unacquainted. Unhappily the diffusion of quasi-scientific information proceeds slowly. Four years since there appeared in this JOURNAL an editorial description of certain popular fallacies concerning the "New Instantaneous" process; among many well-informed people these same fallacies are still solemnly worshipped. A little photographic education would be very useful to the highly paid leader writer and the well-informed person; let us hope that by another four years they will have received it.

But as to the future professional: I believe we must dismiss as hardly feasible any plan for drumming photography into the undeveloped noddle of a schoolboy concurrently with the contents of his atlas and Colenso. It is a subject, or rather an aggregation of subjects, that from the mere operation of first conditions should be left until the destined photographer has got well forward in hobbledehoyhood. Midway in his teens the lad might be taught the grammar, or, at any rate, the alphabet of pictorial art, by being attached to a perspective class or sketching club, of which many abound. By this means an attempt will have been made to impart to him some, if only a little, of the artistic feeling which is so vital to his after success, for the better he can paint the better his photographs are likely to be. As an instance of the truth of this, I take from many the case of Mr. Vanderweyde, whose photographic portraits are so deservedly appreciated, and who is a skilful water-colour painter, to which, if memory serves me, an old Royal Academy catalogue bears testimony. When the boy has acquired the primary principles governing the laws of landscape and figure composition, advantage should be taken of the receptive condition of his intellect to introduce him to a practical study of the elements of photographic science expounded by competent teachers, whose services, in London at all events, may be readily availed of. Citing only a few instances that occur to mind, I can point to the photographic section of King's College, which has done excellent service in past days, and is still, I believe, in active existence, and to a similar class at the University College. Again, at that most admirable establishment, the Birkbeck, the theory of the science is expounded with commendable lucidity, and I rather fancy the City of London College is similarly distinguished. Independently of private "coaches," some of the minor societies in suburban London hold classes, whilst sincere eulogy must be bestowed upon the incalculably useful endeavours put forth by Mr. Howard Farmer at the Polytechnic. This gentleman's system of instruction is probably the most thorough, as it is unquestionably the most successful, in London. I have conversed with several amateurs whose knowledge of photography, gained by the efficient aid of Mr. Farmer, has been of a far-reaching and comprehensive nature rarely encountered elsewhere. Irrespective of the long list of honours gained at the City and Guilds and other examinations, many of his pupils are frequent medallists at the exhibitions, and it is but bare justice to mention the fact that as a professor of photography Mr. Farmer's success is without parallel. I have no data by me at the moment, and *Whitaker* is silent on the point, but I rather imagine that at some of the great technical schools in the chief northern and midland towns facilities for the study of photography are in existence. I think, however, that I have adduced enough testimony to establish

the fact that steady advances are being made towards the institution of systematic means for educating the photographer of the future, in respect of which it is charming to reflect that we are ahead of some of our quite-too-much-belauded foreign rivals. Recently a kindly clergyman made an offer to the Benevolent Association to adopt an orphan whose father had been a member of that progressively popular Society. This opens up the slight possibility of photographers having, like other bodies, in the remote future, schools for the particular education of their children; but in the meantime it is worthy of notice that in the Home for Little Boys at Swanley—a capably managed charity—the children, among other things, are taught practical photography, and taught it well to boot. Straws prove the direction of the wind, and it may be safely averred that the present efforts to found the future well-being of photography upon such sure bases as the adequate instruction of the young will not be without beneficial results. At any rate, it is pleasurable to dwell upon the fact that photographic knowledge is being disseminated in so earnest a manner, and as this is the season of general jubilation, why, let us also jubilate, say I.

All scientific institutions and schools whose principal mission is the spread of technical learning may be strongly recommended to add photography to their list of subjects, for it is significant of the reception that attends any attempt to teach it that wherever a class is formed, or a series of lectures or demonstrations inaugurated, the results are invariably of a satisfactory nature to all concerned. Old as well as young hands are glad to avail themselves of the undoubted advantages to be gained from listening to an able exposition of the principles underlying a process or a formula. It is a common thing for operators and young assistants to frequent the institutions I have mentioned, and a year or two back Mr. Farmer's audience included one or two gentlemen whose names are honoured words in forensic circles, who had practised photography when the lecturer was in small clothes, all of which confirms the truth of the remark that we are never too old to learn. One praiseworthy benefit that is certain to come from the thorough system of tuition now in vogue cannot be passed over. Operators at present are merely fractional individuals, the term being elastic enough to cover the gentleman who only poses and exposes, the developer, the printer and toner, the spotter-out and the retoucher—say in all six. All-round men are scarce, but there is no reason why they should be. It is grotesque to find that in many establishments the operator is ignorant of printing, the printer unable to develop, and the retoucher a cut above taking the cap off. Assuredly this division of labour is not without its adverse results. To me it is inexplicable. Why, for instance, shouldn't a retoucher always be able to operate, and *vice versa*? Perhaps Mr. Barrett could inform us. Piecemeal photographers are absurdities. Operators although given charge of one particular department should be proficient in every branch, so that the developer knows as well as the printer whether a negative is flat or hard, and the retoucher can vary the exposures as confidently as the operator, and every one of them know the why and wherefore of the entire business.

But this is a wide subject and I can only glance at it in passing. I think we may reasonably hope for much solid good from the onward march of the attempt to found a system of photographic education for the mass. When a new race had sprung up, avowedly hostile to the present Joseph, possibly a little extraneous benefit will result to certain home industries now at the mercy of the terrible foreigner, for in the production of a new and original species of photographer we may by accident generate a revised edition of the genus manufacturer, in which agreeable contingency it won't be any longer necessary to ask the gentleman across the Channel to sensitise our paper because we can't do it properly in these islands, nor to sell us gelatine, bromide, pyro, silver, glass, mounts—everything, in fact, employed to make a picture—because we haven't sufficient enterprise to make them well and cheaply ourselves. Also, to follow Mr. Harrison's caustic lead, when we go to the National Gallery in a few years' time the vestibule may perhaps contain a fresh set of carbon prints of the high-priced gems upstairs, executed by a British and not a Continental house, with the explanatory legends beneath done into a language understood of the young man from the country and the young person out for the day. If these latter things do come to pass, what are the odds that our thanks will be due to Mr. Charles Lock Eastlake?

MARSTON MOORE.

SOME PHOTOGRAPHIC HERESIES.

[A Communication to the Photographic Society of Philadelphia.]

Any photographic theory or opinion opposed to the generally accepted one may be called a kind of heresy, and the heresy of one year frequently becomes the orthodoxy of the next.

The average professional photographer is generally a very conservative

individual, slow to accept anything new or to adapt himself to a new order of things, and yet possessed of more than the average share of ingenuity. This conservatism may arise from the scarcity of writers on photography who are good at making photographs, many of our best photographic writers being proverbially but indifferent photographers; the consequence of this is a large proportion of very fine writing, not without its value to the art-science, perhaps, but which is either misleading or ridiculous to the practical worker. Correct theory is, of course, very useful to the intelligent workman; but a false theory is neither ornamental nor useful, and a theory founded on imagination or superficial experiment is very apt to be false.

Many of us can remember when a collodio-bromide and gelatino-bromide emulsion experimentalist was regarded as a kind of fanatical searcher for the photographic philosopher's stone, and the possibility of producing a dry plate to equal wet collodion in sensitiveness was looked upon as *a par* with photography in natural colours. The journals were half full of the heresy of emulsion photography, but nobody but enthusiasts would read such rot, until Charles Bennett announced photographing an interior by gaslight, and, what was more, showed the results before one of the London photographic societies, when the photographic world began slowly to awake to the fact that it was on the eve of a great photographic revolution. Then, as there was no denying the rapidity of the new gelatine dry plates, those who had mastered the wet collodion process, but had not the energy or ability to acquire at once the skill to do as good work by the new process, naturally blamed the process, and denied the possibility of its producing such good results, and there still are plenty of photographers in this city to-day who profess to believe the same.

When steel pens were introduced, there were for years many who still clung to the old scratching quill pen, but it was buried with them.

I propose to let wet collodion, for negative making, bury itself, having been among the first to dispense with it for that purpose.

Gelatine Plates.—Photographers generally are afraid of a very rapid plate for general work, they say that qualities, such as sparkle and latitude, have to be sacrificed to rapidity. I do not believe a word of it. I hold that a good rapid plate is capable of doing all that a slow plate is, and much more beside. Then why ride a mule when you may have a good horse for the same money? It is like some beginners I know who were very anxious to possess a lens of great rapidity; they obtained one, but never, under any circumstances, think of using it with any but the smallest diaphragms. They have two good legs, but are afraid to walk, and so hop about on one; or they may be likened to a man who uses steam power: when his boiler has been tested to 400 pounds, running with safety at 100 pounds pressure, he is afraid to work at more than 25 pounds, and, as a consequence, is always short of steam to drive his engine and machinery efficiently. Gentlemen, how many photographers are there who take full advantage of the great rapidity of the modern dry plate of to-day? Very few. Indeed, I hold they cannot do so with the appliances which are on the market to-day.

Sometimes we are told that "gelatine has ruined the business." What! enlarging the scope and power of photography has ruined it? Did the collodion process ruin photography? It ruined the Daguerreotype process; but photography? Not much. Gelatine may, and will, supersede collodion for negative making. It cannot ruin photography, but is a new power and blessing to the photographer and the world, and we do not yet know half its capabilities.

Development.—Another heresy of mine is concerning development. Development is not the simple matter some people would have us believe. It is a little science in itself, and not to be learned in a year. Now it is generally understood that slow development is the best treatment for a minimum exposure. My practice is directly opposite to that, inasmuch as I invariably use the most energetic developer I can compound and the plate will stand for such a case. I have no faith in homeopathic development as a remedy for general debility in the latent image. Did we use a weak developer for under exposure on wet collodion plates? No; but both strong and hot, because it was right in theory and practice.

The amateur photographic epidemic is regarded by many professional photographers with a great deal of misgiving, some even going so far as to say, "Amateurs are ruining the business." Now I have had considerable opportunity of forming a correct opinion on this point; and while I admit there is a certain class of mercenary plate spoilers, calling themselves amateurs, who expect their camera to earn its own fodder, or who go to Florida, or some other health resort, with the intention of making photography pay part of their expenses, yet I do not admit that calling themselves amateurs will make them such, in any sense of the word. They are professionals, to all intents and purposes, for the time being. Professional quacks, sailing under false colours. I have no doubt that they do some little injury to the business by cultivating the popular idea that photographs do not cost much to make, and that if a man has good instruments and plenty of light he has every requirement to make good photographs. This idea the genuine amateur is doing yeoman service to correct. See how he is educating the public taste to discriminate between good and bad photographs. Then look at the number of those who buy expensive instruments, and yet never, or only after much experience, produce good photographs. Is not that teaching the public (what they are slow to learn) that skill is an important factor in the production of good photographs? And when the public are able to recognise the qualities of

photographs, and appraise them at their intrinsic value, then the profession will be ruined to all incompetency, whether called amateur or professional, and the skilled workman will find his hands full and prices good.

I was out with my camera a few days ago, and a gentleman came by and asked, pointing to the camera, "What sort of pictures does that make, clear?" I must confess he did not make himself clear to me, so I answered, "That is for making photographs." He said, "But does it make them clear?" I replied, "That depends on how it is used; it is a question of skill, not tools; one man will carve better with a penknife than another will with the finest set of carving tools." While I possess the most complete outfit probably in this city, and set a high value on it, I should be foolish to expect my work to be good simply because I possess good tools.

CHARLES TRUSCOTT.

(To be continued.)

Our Editorial Table.

THE FERROTYPED AND HOW TO MAKE IT.

By E. M. ESTABROOKE. Fifth Edition.

New York: E. & H. Anthony & Co.

SUCH is the rush of beginners into the field of gelatine negative photography that we can quite anticipate many of the latest entrants not yet having had time to make themselves acquainted with any other department of the art, and hence to some the term "ferrotype" in its popularly accepted sense may still be strange. It simply means a collodion positive (in America, an Ambrotype) produced upon a blackened sheet of thin metal instead of upon glass subsequently backed with black varnish. Ferrotype portraiture is the sheet-anchor of those who practise at our seaside resorts or on the sands, and it has a good deal to recommend it. It is not difficult, it is cheap, the picture is finished while you wait; and, to crown all, if well done it is by no means to be despised in respect of its beauty.

We are glad to see a comprehensive work on this subject issued by the Messrs. Anthony. Mr. Estabrooke, in conjunction, as we understand it, with others, seems intimately conversant with the subject treated. But whoever may be the author *de facto*, there is no doubt of the work being an exceedingly useful one to all who practise this branch of photography.

After a brief historical account of the art of positive photography, special chapters are devoted to the glass house and its fittings, to collodion, the silver bath, developer, and manipulations. We have also a chapter on composition and illumination which is quite as applicable to the production of gelatine negatives as to ferrotypes.

It is well known that collodion positives when taken on ferrotype plates have a peculiar sinking or yellowing of the high lights. A portion of this manual is devoted to the remedies for this defect. One mode of avoiding this, we learn, "is by using a weak wash of tannin upon the plate before it is placed in the fixing bath. The solution of tannin eliminates all the sulphate of iron that may remain in the film after development and washing, and which, if left there, forms a compound with the cyanide which gives the yellow colour. Another mode of producing fine whites and rich velvety blacks, with freedom from fog, is to proceed as follows:—Make a saturated solution of protosulphate of iron, into which drop a solution of tannin, shaking the mixture all the while until the precipitate of tannate of iron ceases to be redissolved; then add drop by drop of a weak solution of nitric acid until the precipitate is dissolved and the iron solution becomes of a clear bluish colour. To one ounce of this add ten or eleven ounces of water and as much acetic acid as may be found necessary." This constitutes the developer. But we may add that a solution of bichloride of mercury properly made and properly applied, will impart a fine white colour to a dingy ferrotype.

WALKS IN THE ARDENNES.

By PERCY LINDLEY.

ALTHOUGH this handbook, which is published at 125, Fleet-street, is written mainly in the interests of cyclists and those who travel on foot or by rail with guns and fishing-rods, yet will it prove invaluable to the photographic tourist. Mr. Lindley has here got together in a most readable form a great amount of useful information of a topographical nature illustrated by numerous engravings.

THE MAGIC LANTERN AND ITS APPLICATIONS.

By L. H. LAUDY, Ph.D.

THIS work, which forms No. 19 of Anthony's Photographic Series, is written by a gentleman well known in New York scientific circles, and is published by E. & H. Anthony & Co.

In his preface the author says that he has endeavoured to embody

in as concise a form as plain language would permit, a thoroughly practical description of each of the more important lanterns and accessories that have come under his personal observation during some fourteen years of practice connected with the School of Mines, Columbia College. Dr. Laudy carries out his endeavour in a very excellent and comprehensive manner by describing the various lanterns obtained in commerce. The higher class of lantern for scientific projections is also fully treated of, and drawings are given of the vertical lantern with rectangular prisms, the electric and gas microscope, the spectrum projector, and the appliances for utilising polarised light. The work is a valued addition to our lantern literature.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 9788.—"Improvement in the Preparation of Single Transfer Papers used in Producing Carbon Photographs." T. S. SKELTON.—Dated July 12, 1887.

No. 9814.—"An Improvement in Binoocular Telescopes and Stereoscopes." A. H. DOUGLAS-HAMILTON.—Dated July 12, 1887.

No. 9948.—"An Improved Spring Fastening for the Shutters of Dark Slides of Photographic Cameras." T. P. WATSON.—Dated July 15, 1887.

No. 9954.—"Improvements in Photographic Cameras and in the Shutters therefor." A. RAYMENT.—Dated July 15, 1887.

PATENTS LAPSED.

No. 1650.—"Photographic Shutters." R. REYNOLDS and another.—Dated 1883.

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC PRINTING MACHINES.

No. 10,770.—JOHN URIE, senior, and JOHN URIE, junior, 83, Jamaica-street, Glasgow, Lanarkshire.—August 23, 1886.

OUR invention has reference to photographic printing machines, which print the pictures from the transparent negatives on the sensitised paper automatically in long lengths by artificial light. And the invention comprises a new or improved construction, or arrangement and combination, of the mechanism for so automatically printing the photographs in said printing machines:—That is, of the mechanism which performs all the necessary operations, of putting off and on the light so as to give the paper the proper period of exposure to the light, and also release the paper from between the negative and its pressure pad, and shifts the paper the required distances after each print for the new picture, and presses it against the negative again, all intermittently and in proper sequential time by the machine or mechanism itself when it has been set to work, with the roll of paper in place.

The nature and novelty of the invention, or construction and arrangement of the mechanism, consist all as follows:—The roll of sensitised paper and all the working mechanism are enclosed in a moderately sized, longitudinal, rectangular box, having the aperture in the middle of the top or lid, for inserting and securing the set or "nest" of various sized frames to fix the negatives in; the gas or other artificial light used being arranged over the aperture and negative, so as to be raised further from or lowered near to the negative to regulate the strength of light desired for the work or density of negative in hand for the time being. The roll of sensitised paper to be printed is mounted on a spool or bobbin in the upper part of one end of the close dark box, and led along close over its pressing pad and under the negative and opening in the centre and top of box, on to and round a large measuring drum; through and between this and a spring gripping roller, over the latter, either down into a deep dark chamber or recess for receiving the printed strip or web, or this may be led, as so printed and measured, on to a special winding-up drum or bobbin at the other end of the box under the supply bobbin, all so far mounted much as in former machines, but with the journals of rollers or drums carried by bush bearings in the sides of the box. But by this invention the whole mechanism for performing and regulating the work and movements automatically is new, and much more simple than in former machines of this kind. This mechanism requires no special frame, and consists of clock mechanism or reducing wheel gear driven by a chain and weight, or by an endless chain, with weight hooked on to one line of the chain and shifted to the top as it runs down to the bottom, saving all winding up; which arrangement is also applicable for driving the paper-measuring or the taking-up drums direct. This clock or motor gearing, which actuates the whole regulating mechanism, could also be driven by a strong spring and be wound up from time to time as required, and would be regulated to various speeds by a fan spindle with radial arms and air vanes outside, which could be shifted out and in radially by hand on the arms, to suit the speed of the gearing and motor desired, and also of the radial pin barrel actuated by it, to the time of each revolution of this barrel desired to actuate the lever mechanism, which gives and regulates the necessary intermediate motions sequentially as hereinbefore referred to. This time speed pin barrel, turned at any regulated speed by the clockwork wheel gearing and regulating fan as described, makes a turn in, say, from one to three minutes, and has four, five, six, or other number of annular rows of pins, all of equal lengths; the first set commencing with one pin in the circle, and the second with two pins in the circle, and so on, all so as to give from one to six actions to the lever, according to the set of pins it is brought opposite. The journal bearings of this pin barrel, and its actuating clock mechanism, require no special framing, but are secured to the bottom of the box inside, and the barrel is set transverse-wise near the middle of the box, and has ranged parallel to it a double armed crank or bar lever mounted loose on a transverse horizontal

spindle, which traverses through its crank journals, and works in slide journal bearings in the sides of the box, all parallel and horizontal to the axis of the said pin barrel and a little in front of the pins. This horizontal spindle has a short adjustable lever fixed on it inside the box, projecting out in the parallel plane of the pins, so as to be actuated by any set of these pins, according as the spindle is drawn forward in front of the box by a handle on its outside. The lever of this spindle would rest on the long crank bar, carried by the double arm on its spindle, and depress this also, as well as its actual lever, each time a pin came round in the circle, and this double-armed lever would carry a long weighted lever, preferably at the back end, and which would have a counterbalancing weight on it, which would always bring the lever back to its normal position, while it would have another lever which would actuate the short lever of a gas tap or valve, so as to shut it each time the pin came round. This double bar lever would also at each end carry a vertical reciprocating frame in guides on the side of the box, secured to and carrying the pad on the top of them, for pressing the paper against the negative, with regulating spiral or other springs on and between joint stems on the lever, and on the under side of the lower traverse bar of the guide frame; all so that, as the gas was shut off by the action of the levers, the pressing pad and frame carrying it, would be lowered so as to allow the paper passing over it to be drawn along the measured distance required over its barrel. This measuring of the paper is effected by another lever on the front of this double-armed bar crank projecting out below the rim of the measuring drum, preferably on the front end close inside the box, with a vertical acting oscillating pawl on it, projecting upwards so as to take into divisional projections on the rim of the measuring wheel; these projections being so divided round the rim of the wheel as to decide the length of paper to be measured off at each action. The vertical projecting pawl on the point of the lever is always pressed outwards by a light spring on it, so that, after each action of the lever, it is easily drawn down by the counterbalance weight on the other end of the double crank bar, clear of the projection on the drum it had stopped, and so leave the barrel clear to be turned another measured division the next time it was left free, to turn by the releasing of the pad and paper, above the vertical oscillating frame, and come round against the pawl on the stop lever at the next operation. The falling of the balance weight would also raise the frame and grip the paper between the pad and the negative just before the pawl, on the stopping lever, released the wheel for its next action as described; the balance weight also raising the lever which had shut the gas off, and allow a counterweight or spring acting on the short lever on the gas tap or valve to open it again to the regulated distance and position, ready for the double crank lever to again shut it off, when the pins in the barrel came round and actuated it through the regulating lever on the traversing spindle.

Instead of the double-armed lever drawing down the pad under, and to release the paper as described, the pad could be made stationary, and the lever made to lift the printing frame in an equivalent manner off the pad to release the paper, by its two ends direct, or mounted on hinges along one side, the lever or springs not acting to free the paper until the gas lever had shut the light off, all as described under the first arrangement.

[The complete specification is copiously illustrated.]

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
July 26	Great Britain (Technical)	5A, Pall Mall East.
" 26	Bolton Club	The Studio, Chancery-lane, Bolton.
" 27	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 28	Liverpool Amateur	Royal Institution, Colquhoun-street.
" 28	Oldham	The Lyceum, Oldham.
" 28	London and Provincial	Mason's Hall, Basinghall-street.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night a special general meeting of the above Society was held at 5A, Pall Mall East, London, Mr. James Glaisher, F.R.S., President, in the chair.

The meeting revised a portion of the rules of the Society and then adjourned the remainder of the work until the second Tuesday in October.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, July 14, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. J. J. Briginshaw presided.

Mr. J. T. TAYLOR read a published letter by Mr. Prestwich, speaking of the warm reception given by Glasgow photographers to their photographic visitors at the recent Convention.

The CHAIRMAN said that everything had been done at Glasgow to promote the pleasure and comfort of the visitors, and that at Edinburgh they were welcomed by the photographers, taken about in conveyances, shown over places of interest in the city, and entertained at luncheon.

Mr. W. M. ASHMAN suggested that the Hon. Secretary should write to the corresponding member of the Association in Paris, Professor Stebbing, and ask for full particulars as to what was being done in relation to the suggestion of the Photographic Society of Douai to convene an International Congress of Photographers in Paris during the Exhibition of 1889.

Mr. A. L. HENDERSON thought that the English Convention might meet in Paris in that year.

The HON. SECRETARY stated that he would write to Professor Stebbing for information. He then laid circulars upon the table relating to an amateur prize competition inaugurated by the Stereoscopic Company.

Mr. A. MACKIE said that the name of the Photographers' Benevolent Association had been entered on the circular without its consent.

Mr. F. W. COX thought it to be a pity, if amateurs wanted an exhibition, that they did not inaugurate it themselves and keep free from trade influence.

The CHAIRMAN wished for a definition of an "amateur."

Mr. H. M. SMITH said that directly a man took money for anything photographic he ceased to be an amateur.

Mr. W. E. DEBENHAM said that it was a pity that the question of amateur and professional had ever been raised; before it was recently raised photographers had always been working amicably together. He should like to gather the opinion whether the words "photography in colours" could be applied to photographs artificially coloured by hand without misleading the public.

Several members spoke upon the point, after which the CHAIRMAN said that the meeting seemed to be unanimously of opinion that the term "photography in colours" could not be justly applied to photographs artificially coloured.

Mr. L. MEDLAND exhibited photographs of animals taken by himself at the Zoological Gardens in Regent's Park. He had been disappointed in trying to take the bears; they had had so many buns the day before that they would not climb the pole.

Mr. SMITH asked if the diaphragmatic shutter could be applied to any form of lens; could it be applied to Darlot's cabinets of lenses?

Mr. TAYLOR replied that it could, because these lenses were all properly ratioed in their cells.

Mr. W. ENGLAND liked the diaphragmatic shutter better than any other he had ever used.

Mr. MEDLAND exhibited a print of the royal train as it passed through Barnett the night before; it had dark spots upon it where emulsion had been spilt upon the back of the negative plate. Why was that?

Mr. J. B. E. WELLINGTON replied that it was because Mr. Medland had held the plate up before the dark room window to see if it were fully developed, and the light being too strong had fogged the image except where protected by the spots.

Mr. DEBENHAM said that it might also have been caused by stray light in the camera slide.

Mr. Medland exhibited a pinhole negative much blurred.

Mr. DEBENHAM remarked that the hole had been too large; blurring was more noticeable when the plate was near the hole than when far from it, loss of sharpness being more striking the smaller the picture.

Mr. HENDERSON thought that the hole might have been really a tube; the hole should be pricked in something very thin, such as a piece of tinsel.

Mr. DEBENHAM said that some very presentable work had been done with pinhole cameras in France.

The Chairman laid on the table the prospectus of the coming Exhibition of the Photographic Society.

The meeting then broke up.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE monthly meeting of the above Society was held on the 5th instant.—The President, Mr. T. S. Yeomans in the chair. There was a good attendance.

The PRESIDENT asked the Committee appointed what had been done towards securing a photograph of each member, with a view of so combining them as to form a photographic group of the members of the year.

Dr. MORTON replied, and gave information which appeared satisfactory.

A discussion arose on the keeping qualities of dry plates, in which Messrs. Yeomans, Morton, Gilley, and Platts, took part. The conclusion arrived at was that a bromide plate would keep indefinitely and in good condition if kept from damp and air, and that the metallic stains which sometimes appeared on a plate were due to the action of the impure atmosphere to which they had been exposed.

Mr. MALEHAM offered a dozen plates purchased six years ago, which had never been opened, to any members who would test them.

Two competitions took place at this meeting, namely, the usual monthly one, subject, "Sunlight and Shadow," and one for the prize offered by the President for "The most original and artistic photograph taken on the Haddon Hall Excursion." In both competitions the pictures exhibited praiseworthy attempts at the artistic treatment of the subjects in hand. The following are the results: "Sunlight and Shadow," 1st, Mr. Joseph Taylor (Hon. Secretary); 2nd, Mr. T. G. Hibbert. "Haddon Hall," Mr. T. G. Hibbert.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE ordinary meeting of the above was held in the Free Public Library on Thursday evening, the 14th instant.—Mr. J. A. Forrest, President, in the chair.

Mr. H. Williamson, Dr. Stansfield, Mr. T. S. Mayne, and Dr. Proctor, were elected as members.

The Secretary had an interesting exhibit of a ball-headed camera stand invented by Mr. John Brown, a member of the Belfast Photographic Society; it was freely criticised, and pronounced a great improvement on stands somewhat similar in principle. The inventor had used it extensively in yachting excursions and in places where the ground was exceedingly rough and uneven, but had never found, no matter what the position of the tripod, any difficulty in getting the camera almost instantly properly placed and at the same time perfectly rigid. The ball to which the camera is screwed is of wood, and is held by a series of metal clips, which are contracted by pressing a small lever on the tripod proper, being then immovable until released. The ball and metal work is light, considering its strength, and occupies about the same space as an ordinary tripod head.

A view finder from Messrs. Newton's, Liverpool, giving the image unreversed, and a roller slide of Messrs. Mergan & Kidd's with Rogers's registering indicator, were also exhibited, the latter an addition to the existing form of slide, being a circular brass disc numbered for twenty-four exposures, which revolves with the roller holding the film, and then locks itself when the exact quantity has passed off.

Mr. B. J. SAYEE exhibited an album of prints made entirely from paper negatives which had not been oiled; the results were very fine, and had Mr. Sayee made a secret of the matter it would have been impossible to have said that they were not from glass, printing without rendering the negatives translucent seeming to hide the granularity of the paper, a defect the oiling seems only sometimes to make apparent.

Appropos of paper, Mr. P. LANGE and Dr. KENTON, of Chester, wished to lodge a complaint against the Eastman Company. No firm advertises their goods more largely, yet when a supply of either negative paper or stripping films is required it is almost impossible to get them, the demand seemingly being in excess of the supply. They had both been put to great inconvenience on several occasions, and thought Messrs. Eastman should take steps to rectify the matter, especially so now that the height of the season is on.

A number of prints of the race in the Mersey between the yachts "Thistle" and "Irex" were exhibited by various members. Mr. J. H. Day had a number of Marple Hall, near Buxton, which were exceedingly effective; whilst the President showed what a veteran he was in the art by exhibiting an enlargement of the moon done by himself so far back as February, 1854, in conjunction with Mr. Hartnup, the Astronomer to the Mersey Dock Board. The exposure had been one minute and a half, the resulting negative giving a figure of only a little over an inch, yet so perfect was it that the enlargement was quite sharp, showing all the principal craters and various surface markings.

The Jubilee excursion to Trefriw was productive of an immense number of prints, a collection of which was made for presentation to Alderman Samuelson, who had originated the trip, and was to have entertained the members, but was prevented by sickness at home; this, however, in no way interfered with the success of the trip, the only *contretemps* of the day being the deluding of a number of members into changing their plates in an improvised dark room at the hotel, with the result that they proved hopelessly fogged on development.

Mr. LANGE gave an interesting practical demonstration of the working of Eastman's stripping films, he having been giving them an exhaustive trial of late, which was listened to with much attention, and created some controversy on the best mode of working. He had produced some most satisfactory results, but had to depart in some respects from the recognised formula. Coating the glass plate with collodion not acting, he had dissolved four grains of unvulcanised Para bottle rubber cut fine in one ounce of pure benzine; this when brushed quickly over the plate gave an exceedingly even substratum. Naphtha may be used in lieu of benzine, but when it is the quantity of rubber has to be increased to six grains. Mr. Lange spoke of the difficulty of getting it to dissolve, requiring from two to three days to attain that result.

Mr. H. N. ATKINS suggested that if, instead of the rubber as sold in strips in the shops, he got the ordinary article and used the white inner portion, it would dissolve much more rapidly, not being affected by the atmosphere, which had a tendency to make it hard.

Mr. LANGE also threw out as a hint to the uninitiated that the films required to be developed to about double their seeming density, as otherwise when they came to be printed from they would be found to be too reduced to give a satisfactory result.

At the close of Mr. Lange's demonstration an interesting discussion took place between him and Dr. Kenyon on the merits of film photography.

The meeting then broke up.

DERBY PHOTOGRAPHIC SOCIETY.

THE members of this Society had an outdoor excursion to Monsal Dale and Cressbrook on July 2, which was well attended, and some excellent negatives obtained.

On Saturday last the outing was to Rowsley and Haddon Hall. The attendance was a very good one, and although a severe thunderstorm visited the district and marred the proceedings during a portion of the afternoon, upwards of sixty plates were exposed in and about the Hall, where subjects for the camera are abundant.

The next outing will take place on July 30 to Wingfield Manor.

GLOUCESTERSHIRE PHOTOGRAPHIC SOCIETY.

THE second meeting of the above Society was held at the School of Science, Gloucester, on Friday, July 1, 1887, to receive the report of the Provisional Committee appointed to draw up a set of rules, and also to elect officers.

The following were appointed:—*President*: Mr. George Embrey, F.C.S.—*Committee*: Messrs. W. J. Jenkins, W. B. Wood, A. H. Pitcher.—*Hon. Secretary and Treasurer*: F. H. Burr, 8, Midland-road, Gloucester.

The first excursion took place on Friday, July 8, Ledbury and district being selected, the party being conveyed by brake. Ledbury was reached in good time, and the afternoon was none too long to secure photographs of its market house, church interior, picturesque courts and alleys, and fine timbered houses. A capital spread at the "Royal Oak," a successful ballot for five new members, and a pleasant drive home in the cool of the evening, completed a most successful and enjoyable excursion, the average number of plates exposed by each member being eleven.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

AT the last meeting of this Society, on July 6, Mr. WOLFF, who occupied the chair, explained and demonstrated the method of manipulating his self-adhesive mounting boards. These mounts are of the usual gilt bevelled-edge description and are coated with an adhesive substance which when dry does not alter their appearance in any way. The prints to be mounted, if dried, are soaked in water for a few moments, or are taken from the last washing, and placed between blotting paper to remove superfluous moisture. They are then placed in position on the mounting board, covered with a piece of paper, and smoothed down with the hand.

It was announced that the Hon. Secretary offered a prize of one guinea for the best series of six prints from this year's negatives, to be awarded at the first meeting in December.

An outdoor meeting of the Society was arranged for Saturday, July 30 at

Cassiobury Park, Watford. Trains from Easton at one o'clock and forty minutes past one.

The Society then adjourned to meet again on October 5.

HALIFAX PHOTOGRAPHIC CLUB.

THE annual day excursion of the Club took place on Monday, July 11, the place selected being Balton Woods, Wharfedale. The early part of the day turned out to be most unfavourable for photographic operations, being dark and cloudy, with heavy showers, accompanied with strong gusts of wind. A party of fourteen, however, believing in the old and trite saying that fortune favours the brave, mustered and drove from Skipton to the Abbey, after a rather dispiriting railway journey. Towards noon the sun broke through the clouds, and a change for the better was hopefully predicted, and fortunately verified later, for a very enjoyable afternoon was spent "by mead and stream, in foxglove dells and ferny coombes." Between sixty and seventy plates were exposed, and, it is hoped, some good pictures bagged, to remind one in days to come that every cloud has its silver lining. The party drove back to Skipton in the evening, where a very bountiful repast awaited them at the Midland Hotel, which soon went a long way to make all feel well satisfied with themselves.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE annual outdoor meeting and excursion of the above Society took place on Thursday, June 30, to Lugala and Lough Dan. The party met at Bray at about half-past nine a.m., on the arrival of the various trains from Dublin and Kingstown, and started at once in the vehicles which were in waiting for Lugala and Lough Dan. The day was all that could be desired. Cameras were set up and various "bits" taken, every one seeming to find something to his taste, and a couple of hours were spent very pleasantly in the vicinity. When the lake was reached the whole party removed their clothing and had a plunge in its cool waters, from which they emerged very much refreshed. Boats were waiting here for the party, who embarked and proceeded to the lower end of the lake, where the cars were waiting, and drove to Roundwood, where a repast was provided at Keane's Hotel. The party then returned home, having enjoyed a pleasant day and exposed seventy-six plates of all sizes from 12 x 10 to quarter-plates.

Correspondence.

Correspondents should never write on both sides of the paper.

PRESENTATION BY M. DURRONI OF A SMALL HAND CAMERA.—SEVERAL NEW LENSES AND A FOCUSSING GLASS PRESENTED BY M. BALBRECH.—A NOTE-BOOK FOR AMATEURS.—PHOTOGRAPHIC PUBLICATIONS BY M. GAUTHIER-VILLARS.—PHOTO-SCULPTURE.—A NEW INSTANTANEOUS SHUTTER.—A DEMAND FOR PORTRAITS OF THE FATHERS OF PHOTOGRAPHY.—LANTERN VIEWS OF CONSTANTINOPLE.

M. DURRONI exhibited an apparatus which he calls "photo-éclair." It consists of a circular camera about two inches thick; it carries five small plates about one inch square, which, by turning the back of the camera, are made to come one after the other before the lens. To the lens is adapted a revolving shutter. The apparatus is intended to be held in the hand, so as to get a shot when the occasion presents itself.

M. Balbrech presented several of his new lenses, which he said were made by combining "two flint with one crown;" the three are then joined together with Canadian balm, "Baume de Canada." Several of the members spoke highly of these new lenses.

The same gentleman presented a focussing glass, far superior to those in general use here.

Two advantages can be cited. When set for the sight of the owner, said the inventor, a friend can make use of it without it being focussed once again; this is obtained by means of a sliding rule engraved upon the double telescope of the apparatus. When the instrument is placed upon the ground-glass of the camera in order to enlarge the image, the inventor says, as his instrument is achromatised every line in the field of the focussing glass is faithfully delineated: this is the second advantage.

A pocket-book was laid upon the table containing useful information for amateurs—a little good advice as well; one of which is, never to be satisfied by putting a number on the dark slide and counting upon one's memory to know if the plate contained therein be exposed or not. The only sure and practical method is to paste a thin band of gummed paper over the top of the shutter of the dark slide; if the paper is intact the plate has not been exposed, if the paper is torn it is a certain proof that the slide has been exposed.

M. Londe criticised the idea of pasting a number on plates to be developed. The best and most simple method, said he, is to write on the bottom of the sensible surface with a lead pencil; the plate may be developed, fixed, and manipulated with the writing and cannot be obliterated.

A certain number of photographic publications were presented, among others a *Manuel à l'Usage des Officiers, des Explorateurs, et des Touristes*, par le Commandant E. Joly; a *Manuel pratique de Photographie instantanée*, par A. Agie; *La Photographie Astronomique*, par M. Le Contre-Amiral E. Mouchez, Directeur de l'Observatoire de Paris. These books have just come from the press of M. Gauthier-Villars, the well-known and highly-esteemed photographic publisher of Paris.

I note here that M. Lazard sent in a communication on the process he employs to obtain busts, statues, &c., by means of photography (photo-sculpture). As this gentleman's letter was very long it was not read, but put aside to be published in the *Bulletin*.

M. Martinet presented a new instantaneous shutter, being the best, I think, I have ever seen. It opens from the centre and closes in the same manner. Its place is, therefore, indicated in the centre of the lens between the two glasses. The inventor says, "*La pose est facultative*;" in fact, any pose to the rapidity of the two-hundredth part of a second can be obtained. But what pleased me most in the instrument is, that the full opening can be obtained in a fraction of a second and be kept open at the will of the operator. He has only to press the indiarubber ball, it closes instantaneously. Many other features and advantages could be enumerated, but difficult to understand without drawings or seeing the instrument.

One of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY writes me that he is preparing for publication a history of photography. I should very much like, said he, to illustrate it with the portraits of Daguerre, Niepce, &c. This gentleman asks me to assist him in getting photographs or portraits of the masters of our art. I laid his request before my colleagues. The President kindly said that the Society would be happy to endeavour to obtain the desired proofs. I see, by THE BRITISH JOURNAL OF PHOTOGRAPHY of July 1, that Charles Mason, in the paragraph, *Our Fathers: Where are they?* complains of the difficulty to obtain portraits of the old masters of our art. Let all assist these gentlemen in their praiseworthy endeavours to illustrate their historical works on photography. The penalty of such publications is the sole cause why Mungo Ponton's name is unknown to many of the admirers of photography.

The Society broke up after an interesting lantern exhibition of the views of Constantinople, said views having been obtained by a little hand apparatus by a passing amateur.

PROF. E. STEEBING.

59, Rue des Batignolles, Paris.

HALATION AND ITS CURE.

To the Editors.

GENTLEMEN,—I am glad to see by your leader of July 1 that you are giving to this defect in photographic negatives your earnest attention, and trying after an experimental remedy. It has been on my mind, and under experiment also, for some months, and I would like to give you the result of my trial of a remedy which I think is very effectual as a cure, very cheap in application, and very convenient in the rapidity with which it can be used in the preparation of negatives by "backing." I have not a doubt in my mind after comparison of a number of negatives of landscape subjects taken with and without "backing," that it is a very decided improvement to the result on all negatives, no matter what the subject may be, or length of exposure given; but in cases where long exposures are imperative, such as interiors or outdoor subjects in shaded situations, where exposures of a minute or upwards are necessary, and where the thin boughs of trees are usually in strong relief against the sky, the difference in quality of such negatives when "backed" and not so treated is very marked and unmistakably in favour of the "backed" plate.

I have tried the collodion stained with aurine and roseine. It is a very good "backing," and easily applied; but in the rather dim light of the dark room, in which it is advisable only to expose the plates for preparation, it is not easy to coat them perfectly without spilling some of the contents, either on the hands or workbench, or possibly over-running the edge of the plate on to the face, to its utter ruin; and the stain of the aurine, &c., is so very strong if it should happen to touch the hands or the clothing of the operator that I found it rather too great a trial of patience to continue its use. Then, again, it is rather difficult to scrape off perfectly, which should be done before development, in order to be able to judge properly as to the density before fixing.

The remedy I have settled down to is not new, and has been recommended before, but it is the convenience of its use that recommends itself to my taste. Dissolve as much common asphaltum in benzole as will make it the consistency of thin cream, lay the plates face downwards on a sheet of clean paper (blotting in preference), pour a small pool of it into the centre of a plate, and spread it quickly over with a small, flat, soft brush to within, say, a quarter of an inch of the edge of the plate, and let it dry; by the time three plates have been coated the first is dry enough to rear up on edge and set aside on a shelf to harden—and by the time seven or eight plates have been so treated all tackiness has left the first plate, and it can safely be put away, either in the dark slides or in a grooved box. So much, then, for rapidity and convenience in preparing the plates. As to cure of the fault of "halation," I have put it to the following crucial test:—I exposed a plate so "backed" to the interior of a church for a period of two hours, and obtained a very perfect negative, without a trace of "halation" about the three Gothic windows in the chancel (the centre of the picture), which is a far more severe test of efficiency than even tree-boughs against the sky, for which also it is a perfect preservative.

It appears to me that the warm brown colour of the asphaltum in optical contact with the glass plate absorbs every ray which passes through the film, and allows no refraction whatever to take place.

Some one may ask, "How about removing it before development?" Nothing is more easy, or more promptly done, if the plate is held at a steep slope in the left hand, with a corner pressed firmly against the breast, and a broad, sharp chisel used with the right hand, commencing at the bottom and working upwards. The dry asphaltum falls off in a heavy powder on to the floor of the room, and may be swept up and removed by daylight most readily. I can easily clean off the "backing" from a 12 x 10 plate in two minutes by such means, and leave the plate practically (but not chemically) clean for development. There is nothing in the minute quantity of asphaltum left on the plate to act injuriously in any way on the developer, which can perhaps hardly be safely said of the aurine and collodion, if not absolutely cleaned off, as that is such a powerful stain that the gelatine film might suffer by absorption of colour if any escaped into the developer. If your researches result in any better or more convenient method, I shall be pleased to learn it; but I doubt whether anything can be found more readily applied or removed, and so conveniently rapid in its "setting" property after application to the plate, as one does not care to have to wait (for perhaps half an hour) for the drying of any aqueous solution of dextrine, gum, and sienna coating, which may be effectual, and easily removed by a damp sponge, but which takes some time to set firmly enough to make it safe to put the plates into the dark slides.—I am, yours, &c.,

GEORGE BANKART.

FINDERS AND FOCUSERS.

To the EDITORS.

GENTLEMEN,—Was Mr. S. D. McKellen speaking in jest or in earnest when he said at the Convention that Mr. Lionel Clark's apparently original and certainly useful method of converting the focussing screen of the camera into a finder, using a separate lens, was covered by a patent obtained by the speaker?

If Mr. McKellen has really patented a finder and focuser, the salient point of which consists in having a separate lens and ground-glass connected with the working lens and sensitive surface, and acting in harmony with them, then I have only to say I am sorry for his patent, as there is no one conversant with the past history of photographic cameras, or who is a careful reader of your JOURNAL, who does not know that such has for some years been done. Will Mr. McKellen please say what he claims?—I am, yours, &c.,

JUMELLE.

THE LATE CONVENTION.

To the EDITORS.

GENTLEMEN,—A small error has got into the report of my paper read at the Convention. In line fourteen (page 438), instead of eighty "per cent.," it should read eighty degrees.

I heartily endorse all that Mr. Prestwich has said respecting the success of the Convention. Great praise and thanks are also due to the Glasgow ladies, especially to Mrs. Mason, who did so much for our comfort and enjoyment by placing the rooms of her hotel at our disposal for Council meetings and other purposes.

I much regret that some journalists have thought fit to attempt to discountenance the Convention, but trust, if they are open to conviction, that they will yet see the usefulness of these meetings.—I am, yours, &c.,

49, King William-street, London, July 16, 1887. A. L. HENDERSON.

[Mr. Henderson evidently, for the moment, loses sight of the fact that no movement whatever of an advance nature has ever yet been made that has not had to encounter opposition and obstruction, either open or veiled.—Eds.]

THE RIGHT TO THE NEGATIVE.

To the EDITORS.

GENTLEMEN,—The non-acceptance of the lady's challenge to discuss the question of the ownership of the portrait negative by Mr. Coan appears to have brought the correspondence to an end. I had hoped that you would have reviewed the arguments or statements made by the different correspondents and given your remarks thereon. As you have not done this, but have expressed yourselves in favour of the custom of the trade as the unwritten law to be taken as our guide when no written law exists, perhaps you will permit me to make a remark or two on this custom.

Custom whose origin is obscure from time, or whose origin, if discovered, is based on equity, can alone be held in valid law. Now the origin of the trade's claim to the portrait negative is not lost in obscurity; it belongs to our own times, and we know it. Its origin arose first in the sitters' ignorance of the negative, or of its nature and power, and, secondly, in the trade's readiness to take advantage of such ignorance. Not an honourable origin. Proof of these statements are not wanting. Let me quote from your issue of April 29. Mr. Barber, of Sheffield, writes: "Query, Why should photographers be supposed to use negatives at all? Are we obliged to say how we produce our work?" Again, in your issue of June 10, Mr. A. L. Stevenson, of Durham, writes: "When a dozen portraits of any size are ordered, the sitter is seldom, I believe, able to prove that there was a negative. By general knowledge he may be aware that he cannot be photographed without one, but he never sees it, unless by special goodwill of the operator, and if he gets his dozen

cabinets that is all he asked for, and all that was promised him, or that he can prove is in existence."

Can a custom so based be held as good law? In my opinion it ought not. In the legal cases you cite the claimants were equally wrong. They sued for what did not belong to them. In your issue of June 17 your correspondent "Mac" writes, "What now about the negative? The glass and the film are undoubtedly the photographer's, and the impressed portrait on the film belongs as undoubtedly to the sitter—a joint partnership." Now this joint partnership is inseparable; a dissolution of it cannot take place without an arrangement between both owners, unless the negative be destroyed. The photographer has, however, possession, and to abuse his trust in any way would be dishonest, which no custom of trade could justify.

Respectable photographers do not abuse their trust, and as your correspondent "Mac" refers to this I shall again quote from same letter. He writes, "It has been the custom for photographers to preserve and retain the portrait negative, not for their own benefit only but for the benefit of their clients also, from whom an expressed wish that it be no longer retained would receive immediate attention. I am an amateur of the old wet date, and this has been my experience of my professional friends, with some of whom I have been long intimate. They are good, generous men—men of strict honour."

All praise to "Mac's" friends and to the many hundreds throughout the country like them—equally good, generous, and of strict honour.—I am, yours, &c.,

J. F.

FIFTY SITTINGS FOR A PORTRAIT.

To the EDITORS.

GENTLEMEN,—Mr. R. Barrett, in the course of his observations in No. 1417 of this JOURNAL, says that Sir Thomas Lawrence and Sir Joshua Reynolds have repeatedly had so many as fifty sittings for a portrait, and that nowadays a great deal of this bother and worry to artist and model alike is obviated.

I should be obliged to Mr. Barrett if he would say in what way a portrait painter may avoid or shorten the sittings nowadays.—I am, yours, &c.,

Liverpool, July 9, 1887.

A PAINTER.

Exchange Column.

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

Bionial lantern and object slides for microscope. Cash adjustments.—Address, W. I. CHADWICK, Brooklands, Manchester.

Will exchange one of Rouch's patent whole-plate cameras, with one double dark slide with waterproof case, for Universal studio camera, same size, with dark slides.—Address, W. C. BASZET, care of H. Butler, 127, Eastgate, Rochester.

12 x 10 Mängey portrait lens, 14 x 11 studio camera, two slides, and table stand, plain cloth, and outdoor background, for exchange. Wanted, a portable camera and lens. Difference adjusted.—Address, C. HEWITT, Photographer, Weymouth.

Silver close-emb Albert guard, weighs over four and a half ounces, lock to match, exchanged for good rapid rectilinear lens, short focus, or good cabinet lens, or photographic accessories.—Address, HORTON, Photographer, Caroline-street, Cardiff.

Wanted, quarter-plate camera, with three or more double backs, and rapid symmetrical lens, by good makers, in exchange for watertight cases and baths, 15 x 12, two 12 x 9, and 8 x 5 1/2, and head-rest by Johnston.—Address, R. HENDERSON, Station-street, Keswick.

Modern camera, by Hare, 7 1/2 x 5, with six double backs, waterproof case, Dallmeyer's lenses; also quarter-plate camera, by Meagher, with eight double backs, lenses, tripods, &c.; in exchange for microscope. Cash adjustments.—Address, W. I. CHADWICK, Brooklands, Manchester.

Photographer's dark room on two wheels, so built that you can be at work in two minutes on the roadside or anywhere, carries cameras and everything inside, built by coachmaker, cost £7 10s. Will exchange for whole-plate portable bellows camera and group lens; must have two double slides.—Address, W. 5, Waterloo-promenade, Forest-road, Nottingham.

I will exchange a Grubb's 2 1/2 portrait lens (four inches diameter) for 10 x 8 portraits, cost £16, for a good 10 x 8 or whole-plate portable camera; also a half-plate camera, with all improvements, fitted with three double backs, Ross' rapid symmetrical lens, Puccini pneumatic shutter, all in case complete, for a Ross' cabinet lens.—Address, W. T. WHETTER, Photographer, Villiers-road, Bristol.

Answers to Correspondents.

S. A. J.—Sulphide of potassium and "liver of sulphur" are one and the same thing.

C. M. ROBERTSON (Liverpool).—Thanks for suggestion, which we shall probably adopt.

J. LOWE.—The simplest method of making carbon prints on opal glass is to develop direct upon the glass, using a reversed negative.

NEMO.—Paraffine wax is far better for lining a wooden bath which is to contain silver solution than pitch. It may be applied in a similar way.

W. H. H.—Messrs. Sprague & Co. have not published the process by which they produce their "ink photographs," consequently there is no work on the process.

G. BROOKLY.—Unless you require a lens for photographing in very confined situations, by all means choose the lens of the rapid type. It will be far more useful for general purposes.

S. S.—There must be some error in your formula, as fifteen grains of gallic acid cannot be dissolved in an ounce of water. About three or four grains per ounce is all that can be got into solution.

EXPOSED.—Immerse the plates in a solution of bichromate of potash, and well wash. They can then be used again. Unless the whole of the bichromate be eliminated the plates will prove very slow.

A. T. S. BERRINGTON.—We believe the Detective camera we described to be the same as that referred to in the leaf you enclose. It had no lens when received, which explains the Wray lens having been fitted to it.

LUKE J. HEALY.—If you can make zinc surface blocks for working along with type it will prove a valuable acquisition. There are only a few manuals devoted to the subject; Wilkinson's is in the English language, and it is one of the most practical. If you varnish the crayons you will spoil them.

N. B. J. writes: "I should be very much obliged if you would, through the 'Answers to Correspondents,' inform me if you consider carbonate of ammonia has advantages over other alkalies for the pyrogallic development of instantaneous work. I have seen it recommended as a good slow developer, giving plenty of density."—Carbonate of ammonia possesses no advantage over any of the other alkalies, and it is very seldom used for any class of work.

DESMOND HILL.—The size of any subject included in a plate is determined by the focal length of the lens. In your case it may be advisable to have another lens in addition to the present one. The focus that we would suggest for this additional one would be nearly twice that of the other. And, by the way, to assist you in arriving at a conclusion, remove the front lens of your present combination, and see what sort of image as regards dimensions you get with the back one when employed alone. Of course, the camera will have to be expanded very considerably.

J. H. COWARD.—The stripping of the film of an ordinary gelatine negative is a somewhat risky operation unless the glass was specially prepared for the purpose before the emulsion was applied. However, you may proceed as follows:—Place the negative on a levelling stand and pour on a solution of gelatine containing a small proportion of glycerine; allow it to set, then rear the plate up to dry. When the film is perfectly dry, and not before, pass a knife round the edge of the plate and carefully strip. In America and Germany plates prepared specially for stripping are articles of commerce.

A. ELLIS writes as follows: "Having intensified a negative about three months ago with Edwards's intensifier, and taking it up lately to print from, it appeared to be weaker than it was at first, so I determined to make a fresh one by taking a transparency by contact from which to get the new one. With this intention I exposed a plate and developed, but instead of getting a transparency, as I expected, a negative exactly similar to the other was the result. I may mention an inch margin was painted on with 'Bates's black,' which with the other dark parts came out dark. If you will kindly tell me the cause of this, and whether it is of frequent occurrence, you will oblige."—The cause of the apparent, to our correspondent, phenomenon, is that the plate was very much over exposed, and this produced a reversing action of the light. There is nothing uncommon in the matter; indeed, this property of the reverse action of light is utilised by some for producing reversed negatives for the photo-mechanical process.

JOSHUA RILEY says: "I have met with a stubborn case as regards removing the colour or stain from a local spot or place on a 12x10 negative. I thought it very likely your varied experience might aid me in succeeding in doing so, as the negative is one I want to make use of, and at present with this colour it prints too hard on the spot to be of any service. 'How the local colourisation was produced.' The negative was developed with pyro and ammonia, alumed, and fixed as usual, also washed; when, finding the place marked too dense, I thought I would try cyanide; so took a piece of cotton wool, dipped it into a solution of cyanide, and rubbed the place with the cotton wool, which caused the colour to change into a still more non-actinic colour. Can you suggest anything that would remove it?"—In the print enclosed the portions marked as being stained agree closely with the denser parts at one end of the negative, leaving perfectly clear, as we presume, the adjacent transparent shadows. Had the stain encroached upon the shadows, we should have attributed it to imperfect washing, but as it appears only in denser portions of the image this cannot be the case. Perhaps some of our readers can suggest a remedy.

A. L. (New Zealand) writes: "Will you kindly, in your 'Answers to Correspondents,' reply to following queries by numbers:—1. Is a condenser necessary for enlarging, using the lens and camera in which the negative to be enlarged was originally taken, either by daylight or artificial light?—2. What is the most convenient form of using magnesium wire to light a room for photographing by night?—3. Where is Coventry's emulsion pourer to be procured?—4. I see coal-tar varnish mentioned in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC; how is it made?—5. What is the cause of want of definition in bromide prints (by contact) and bad colour?—6. Have you any objection to state whose plates you consider best for pure landscape work? I know you object to recommend any maker, but I am not able to get a trial sample and judge for myself, and it is rather rough to get out a gross of plates and find them unsuitable. As for the goods supplied by local stores, it is not doing justice to the manufacturers to use them, as in many cases they have been damaged out here."—In reply: 1. In working by daylight a condenser is not required, but with artificial light one is desirable.—2. The most convenient plan is to employ one of the lamps sold for the purpose. Mr. Solomon, of Red Lion-square, has a very convenient form, so has Mr. Hart, of Kingsland-green.—3. We have not heard of the article for some time.—4. Brunswick black, as sold at the oilshops, answers the same purpose and is far more pleasant to use, and also saves the messy operation of making. Use it in preference to the other.—5. There should be no want of definition. The bad colour is, no doubt, due to under exposure and long development.—6. We regret that we cannot comply with your wishes. The plates by all the makers you name are good.

ERROR in paper on *Metric Measurements*. For the word "variety," eleventh line, read "vanity."

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, July 27, 1887, will be on *Photographing Flowers*. Saturday outing, Richmond, Meet at Metropolitan Station, Richmond, at half-past two.

CONVENTION NEGATIVES.—Mr. Keene, of Derby, writes:—"The Convention I consider a great success, and I am well pleased with the few negatives already developed. I shall want to take my camera to Scotland again."

J. LILBURN ROSHER, Châlet Rose, Bex, Switzerland, writes: "If you know any one passing through here this summer, I should be glad to see them and give them the use of my dark room and chemicals, as there is no photographer in the town."

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting of this Society will take place on Tuesday next, July 26, at eight p.m., at the Gallery, 5a, Pall Mall East. Open at seven p.m. for journals and conversation.

THOSE photographers who desire to secure most charming effects of water-falls without leaving London should visit "Arcadia" in the Agricultural Hall, and bring with them their detective cameras. Mr. Harry Etherington has made of it a most attractive place.

MEDAL AWARD.—We are pleased to learn that Mr. W. Clement Williams, the Hon. Secretary of the Halifax Photographic Club, has been awarded a silver medal of the first class for an exhibit at the International Photographic Exhibition of Italy held at Florence.

FROM Mr. John Gray, B.Sc., we have received a portrait of himself in three degrees of amplification, if we may so term it. A large head is attached to a smaller body, and these are perched upon a still smaller donkey-cart. J. Downey & Sons, South Shields, are the artists.

GETTING THE FOCUS.—One of the "convened" photographers observed last week that, "while photography used to be considered the Cinderella of all the arts and sciences, he thought it was going to take its proper place now." "And why," asks *Asinus*, who is nothing if not classical, "should not photography still be considered a Cinderella? Is not Cinderella indissolubly associated with the hearth, and is not the Latin for hearth *focus*? Hee-haw!"—*The Bailie*.

AMONG several fine photographs obtained of the groups formed during the various excursions at the Convention, some admirable ones of large dimensions and singular clearness, taken by Mr. John Stuart, of Glasgow, and some lovely platinotypes of smaller dimensions, by Mr. R. Keene, of Derby, were exhibited at the last meeting of the North London Photographic Society on Tuesday by the President of that body. It need not be said that they were examined with great interest.

PHOTOGRAPHIC EXHIBITION IN DUBLIN.—There is to be a Photographic Exhibition in Dublin next October. "Through the kindness of the Academicians," writes Mr. Greenwood Pym, the Hon. Secretary, "we have again secured the splendid galleries of the Royal Hibernian Academy of Arts, second to none for a picture exhibition. We expect to be able to make such arrangements as to carriage as will reduce the cost of this item to exhibitors to almost a nominal sum. There will be a most liberal prize list, details of which, as well as other particulars, will be supplied on application."

CAMERA CLUB.—Excursion (for members and friends) to Pangbourne, &c., Saturday, July 23, 1887. Train from Paddington at twenty-five minutes past ten a.m., arriving at Pangbourne at forty-three minutes past eleven. Later train, for those joining in the afternoon, at five minutes past one p.m., arriving at twenty-eight minutes past two. The London and South-Western from Waterloo can be taken to Reading and a change there effected to the Great Western, but the trains do not fit in well. There are bathing facilities at Pangbourne at all times of the day. Apply to lock-keeper. Dinner at the "George" Hotel, Pangbourne, at fifteen minutes past six p.m., in time to catch the return train to Paddington at fifty-two minutes past seven p.m.

G. B. BRADSHAW & Co., of Altrincham, Cheshire, write: "In your issue of July 1 of THE BRITISH JOURNAL OF PHOTOGRAPHY, and touching upon exhibits at the Manchester Exhibition, we note you say you are left in doubt as to whether the exhibitor was the producer of the enlargement before you. This would be easily accounted for if the other exhibitors have been treated in a similar manner to ourselves. We have four very fine enlargements hung, one of Sir W. C. Brooks and Lady Brooks, over five feet, and three others not so large (altogether covering fifty square feet), for which we had made four wood tablets designed to suit pictures. We followed the Committee's instructions as to colour of ground, lettering, &c., and screwed them on, so that they did not hang outside our own frames, and they simply bore the name of the subject, and stated that they were photographed, enlarged, and finished by us on our own premises; but the Hanging Committee would not allow them to remain on, and, in spite of our entreaties and protestations, they were roughly forced off, in doing which they injured the frames, and changed their positions several times. They damaged the ornamental frames to such an extent that they are now scarcely fit to exhibit."

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1421. VOL. XXXIV.—JULY 29, 1887.

THE BEST MODE OF BACKING PLATES.

In our last remarks upon this subject we briefly touched upon what might be termed the three typical modes of backing plates that have, by one practitioner or another, been recommended—black varnish (that is, solution of asphalté), coloured collodion, and a powder pigment made into a paint. Since then, as will be seen in our last, a correspondent who finds the value of backing to his plates has written to advocate the use of bitumen dissolved in benzole. We entirely coincide with him as to the advantages of bitumen, but we cannot avoid the conclusion that if the systematic use of a backing entailed the employment of a benzole varnish, and the ultimate removal of the coating by scraping, the adoption of this ail to good work would be the exception and not the rule. Now, with plates as at present made, we should hope eventually to see few photographers disregarding its use. We are raising objections not to the effects of this coating, but merely to the practical side of the question, and as our whole purpose is to give descriptions of methods involving the least amount of extra labour or expenditure of time, we dismissed solutions of benzole from the range of practical photographs.

There then remains collodion *versus* paint. The first question to be solved was, Had one of the two any practical advantage over the other? Our method of trial was as follows:—Placing the camera at one end of a long room we arranged a swinging mirror on the floor at the other end, so as to send into the camera the reflection of a bright part of the sky seen through the window; one-half of this reflection we shut off by fastening across the mirror a piece of black velvet. The camera image then consisted of a dead black in immediate juxtaposition with bright sky, the latter being also crossed by the sash bars. As a test object this was better than selecting an ordinary interior with distant window, the velvet offering the best possible medium for exhibiting halation if it existed. We then coated plates of varying degrees of density over one-half of their back surfaces with the various backings under experiment, and gave equal exposures to each side of the partially backed plates, while the unbacked plates were tried against one another.

The results were sufficiently striking. Of the uncoated plates, those with thin films not only rendered the black velvet as a mass of deep grey fog, with the sash bars hardly visible, but the whole plate exhibited a slight haze, palpably demonstrating the worthlessness of the particular plate, and, we should say, of its class, for all subjects including bright objects. With plates possessing a thick rich film the results

were far superior; but still the sash bars were deeply clouded, and grey fog covered the velvet.

When, however, the plates with coated backs were tested, the difference was extreme: the thinnest plate so treated gave results infinitely superior to the thickest of the unbacked plates. Next testing backing against backing, we found that the best of the pigment backings were decidedly superior to the collodionised plates, and thus economy and usefulness were combined. As to the plates among themselves when coated with the best backing there were distinct differences. The thick yellow films (the exposures being long enough in all cases to enable all the furniture in the room to be well brought out) gave the greater portion of the velvet with scarcely a perceptible stain or fog, except close to the light, and there a faintly visible band of fog could be seen upon close scrutiny. The thin plates were not entirely free from fog over the whole of the velvet, thus showing that either our backing was not theoretically perfect or that some of the other fog-exciting causes, referred to in our first article on this subject, were at work.

The plates of medium density gave very fair results, but it could not be said that the velvet was a perfect representation of a black surface.

The backing we employed and found best was a paint made of ivory black and water, held together with a sufficiency of gum arabic solution to cause the paint to exhibit a semi-glossy appearance when dry. Gum was chosen on account of its index of refraction being little removed from that of glass, and we found that if too small a quantity were employed the true action of the backing did not come into play. The colour of rich velvety black, as shown through a sample piece of plain glass, gave way to a more grey tone when the paint was quite dry, and the reflection of a bright object upon it was seen to be distinctly duplicate, though the brightness of the second image was much less conspicuous than was seen with a piece of unpainted glass. It is quite evident that the old experimenters who used lampblack, or other pigment, and water, though they had discovered the cause, and indeed the cure, of halation, yet failed to adopt a really good mode of carrying out the teaching of their discoveries.

In making all these experiments it will naturally be seen that we had a large number of plates to prepare, and it was during the development that we formed the strong opinion against asphalté coated plates above recorded, even the gummy paint with water being troublesome enough to get rid of. In the actual routine of development in a large establishment or in

the home work of an amateur with a kit full of exposed plates, we could see what a drawback this removal of the backing would be, and we endeavoured to devise a method which involved the least outlay of time in getting rid of it. This we achieved by the simple expedient of stirring a little glycerine into the above described paint, the result being that, although the backing dried, in a sense, it was yet so soft that when water was turned upon it the whole coating softened directly and was washed away without difficulty.

The actual formula, then, for the paint that we found most effectual and thoroughly easy of removal stood as follows:—Gum arabic was dissolved in water in the proportion of an ounce of gum to six ounces of water, and for each ounce of gum used an ounce of glycerine was added. In practice we kept a stock of gum dissolved in water—one gum to two water—and we diluted the glycerine with its due proportion of water and then added it to the gum solution. If this were not done and the glycerine were added at once to the gum solution it was apt to cause clots. This gum-arabic-glycerine-water mixture was then used to mix with the powder paint purchased at the oil and colour shops, using a flat knife to work it into a thick cream, a large plate of glass doing duty for the painters' slab. Finally, to ensure an even mixture, the whole was squeezed through muslin into an earthenware vessel. The paint was laid on the back of the plate with a broad camel-hair brush, and a few dozen plates could be coated and reared up to dry in a very short time, while for removing the coating before development a slight rub with the fingers under a stream of water from the tap rapidly dissipated every particle of pigment.

In conclusion, we would in the strongest manner possible express our sense of the extreme value under almost all circumstances of a suitable backing to gelatino-bromide dry plates, and we hope that our remarks may be the means of drawing more attention to this important development of practice.

AMATEURS AND RETOUCHING.

ONE of the most interesting papers for the amateur read at the recent Convention at Glasgow, was that by Mr. T. N. Armstrong on *Home Portraiture*. For many years portraiture has been to the amateur a practically unworked field, not that amateurs did not attempt portraiture—for who is not too well acquainted with the miserable work in that line that generally represented the earlier efforts of the tyro?—but simply because none but the wealthier, who could afford to erect a portrait studio, were in a position to cope with the difficulties of lighting.

With the advent of gelatine plates, however, the necessity for the old glass room, with its flood of light from top, front, and side, ceased, and so far from the conventional "studio" being an advantage, it is a question at the present day whether the reverse is not the case. The system of lighting adopted by most of the leading portrait photographers of to-day differs essentially from that in vogue in the days of wet collodion, partaking more of the character of the illumination of an ordinary room or of a portrait painter's studio. Indeed, we heard a well-known leading professional photographer declare some years ago that if he were building a new portrait studio he would have no lights but the side windows, and, in fact, would prefer an ordinary room for the purpose if the windows were high enough.

That successful portraiture can be executed outside the

glass house, and without special preparations or accessories, is amply proved by those professional portraitists who make a practice of taking "home photographs." In such cases the operator, with his apparatus and plates, presents himself at the residence of his sitter, and, availing himself of circumstances as they exist, makes the best he can of the job. How far success rewards him is shown by the numerous exhibits in this class of portraiture that have been seen in recent exhibitions and elsewhere, many of which are fully equal to the best work executed in the studio.

We can, therefore, cordially agree with every word that Mr. Armstrong says in encouragement of the practice of "home portraiture" by amateurs, feeling convinced that if they devote but a moderate amount of study and attention to the subject they will be amply rewarded in the pleasure afforded both to themselves and their friends. There is an undoubted predilection in favour of portraits which do not proceed from the ordinary professional studio, even though they do not possess the conventional gloss and finish; the mediocre production of an amateur friend will frequently be valued more highly than the really first-class work of the professional simply because "it is so natural." How much more, then, will amateur work be valued if, in addition to the ordinary qualities, fancied or real, attributed to it, it possess also some, if not all, of the artistic finish of the professional.

In recommending the practice of retouching, Mr. Armstrong, therefore, makes a step in the right direction; but in our estimation he errs a little in attaching such prime importance to it. He implies—nay, says in so many words—that until he took lessons in and mastered retouching his portrait work was a miserable failure. Now this is calculated to deter many amateurs, and especially those who aim at turning out only good work, from attempting what appears a hopeless task. How many amateurs have the time, even if they possess the natural capacity, to become proficient in retouching? Retouching is as much a study, and requires as much deep attention, as drawing or painting in the mastery of even the manipulatory details, and a man may be an accomplished and even artistic photographer without possessing in the slightest degree the necessary manipulatory faculty to successfully retouch.

Even suppose he possess the merely mechanical capability of applying the lead to the negative film in a smooth and even manner, his knowledge of anatomy and expression may fail him, and without that knowledge we all know how extremely easy it is to entirely destroy a likeness or alter an expression. Here, then, is taken away at a sweep one of the chief charms of an amateur "home photograph"—its "naturalness" or its likeness to the original.

But, after all, we cannot help thinking that Mr. Armstrong has unnecessarily condemned his untouched work. We have seen a great amount of home portraiture by amateurs that has been entirely untouched so far as the negative is concerned, but which if printed, finished, and burnished with all the care of the professional, would compare favourably with a large proportion of the latter class of work. There will, of course, be instances where retouching may be necessary, as in cases of under exposure, or where errors in lighting have been made, but, as a rule, our counsel to amateurs would be to meddle with the negative as little as possible, no more, in fact, than is required to remove defects, unless they are fairly proficient with both pencil and brush. With the aid of simple screens and reflectors only, and such lighting devices as Mr. Armstrong

mentions in his paper, the amateur portraitist will find himself in a position to turn out remarkably good work "at home."

IN connection with the Convention excursion to Edinburgh, Mr. J. M. Turnbull, of that city, informs us that he and others of the brotherhood there have received several letters from the visitors, thanking them for their reception. "But," says Mr. Turnbull, "you may assure them from me that we here think ourselves highly honoured by their visit, and that the indebtedness is on our part, not on theirs." Our own opinion is that friendly intercourse of this nature acts most powerfully in cementing and strengthening the friendship and good feeling previously existing among the fraternity of different-nationalities, we were going to say, but "citizenships" better expresses the idea. Anyhow, Edinburgh acted right royally on the occasion referred to.

ON more than one occasion we have directed attention to the advantage, in a pecuniary sense, that would probably accrue to photographers at seaside places and other holiday resorts, by their being provided with backgrounds depicting picturesque spots or places of interest in the locality, before which sitters could be posed in the studio. Portraits taken with backgrounds of local scenery would possess considerable interest, as they would always serve as a memento of the visit to that particular place. At most spots of interest which are much frequented by visitors, one usually finds an itinerant photographer located ready to take photographs of them. As a rule, the productions of these itinerants are not of very high order, and they are generally ferrotypes or glass positives. Moreover, owing to the portraits being taken out of doors, and often unavoidably with the sun full on the face, the likeness, however well the work may otherwise be executed, is seldom satisfactory. But if the portrait were taken in a studio, with a judiciously made up background representing a local scene, an interesting picture as well as a pleasing likeness would be secured. We are fully aware that some artists are provided with such backgrounds, but they are not nearly so general as might be imagined, and few make a speciality of them.

IT is not necessary when a portrait is produced in the studio with a scenic background that the latter should be a painted one, for it may be introduced by a second printing from a negative direct from nature. The simple method introduced many years ago by Mr. Edge, of Llandudno, is well adapted to the purpose. Mr. Edge's plan is this: The portrait negative is taken in the studio with a white—or rather, a very light—background, so that when it is printed the figure appears on a plain and slightly toned paper. The figure is then painted over with some non-actinic water colour—gamboge, for example—so as to protect it from light in the second printing. When the colour is dry, the print is exposed behind the landscape negative, care being taken that it is not deeply printed. In washing the prints prior to toning the colour is removed, leaving the paper perfectly clean. It may be explained that the view negative should be of a very weak and delicate character, otherwise the background will appear obtrusive, and thus spoil the artistic effect. The slight tone which the background has before the landscape is printed softens the effect, and gives atmosphere to the picture. A variety of these thin negatives of local scenery could easily be produced and kept in stock ready for use as required. If this were done, sitters could make a selection of the views they preferred as backgrounds for their portraits. Photographers would also be saved the trouble or expense of making the painted backgrounds.

As on the occasion of the Jubilee rejoicings in London and the *fêtes* in the provincial towns, so were photographers—amateur and professional—busy at the naval review at Spithead last week. Some excellent negatives of the event have been secured. These pictures will, of course, be valuable as interesting mementoes of the review. Some of the pictures, we are informed, are somewhat marred by the smoke. In some instances, however, when the camera was to the windward, the smoke and steam have enhanced the effect.

THERE is very little probability of the long-promised Copyright Bill being dealt with this session. However, photographers will do well to be on the alert, and enter into some sort of combination, as we have several times suggested, to watch over their interests in the matter. Although several M.P.'s are, we are told, enthusiastic amateurs, it must be borne in mind that the framers of all the Bills hitherto brought before Parliament are by no means favourably disposed towards photography and photographers. In all the Bills which have been introduced there has been a very stringent clause with reference to the photographer using the negative for any purpose whatever, except to the order of the sitter. If this clause becomes law, enlargements made on speculation, and the exhibition of portraits as specimens without the sanction of the sitters, will be things of the past. Sooner or later, a new Act on Copyright will be passed. When this is done, it will be useless for the profession to complain if it proves inimical to their interests. By the way, this would have formed a good subject for consideration at the recent Convention, seeing it is treated with apathy by the Photographic Society of Great Britain.

COMPLAINTS on the part of the public are very strong as regards the fugitiveness of photographs. One thing appears pretty certain, namely, that the general run of silver prints issued by professional photographers at the present time are of a less permanent character than were those produced twenty years ago. Feeble negatives and lightly sensitised paper have, we surmise, much to answer for in this matter. Long soaking in water, particularly at this season, does not conduce to permanency, and therefore should be avoided. When prints are allowed to soak in water for a long time—twelve or fourteen hours, for instance—and the temperature is high, the brilliancy of the prints is usually more or less degraded. If they are left in water for a still longer period, as is sometimes done, incipient fading, yellowness, and spots, are frequently observable when the prints are finished.

AN evening contemporary says:—

"The owners of the faces portrayed in the *Pall Mall Gazette* yesterday, can scarcely have been flattered by their so-called portraits which appeared in that journal. Except Mr. Newton—and his is but a distant resemblance to himself—the rest of the faces might serve for any one, from Adam to Cleopatra. A man's face is, we suppose, not his private property; but if it is taken from him it might be, at least, treated with politeness."

With regard to the likenesses in question, we can but endorse our contemporary's opinion. The plan usually adopted for this kind of illustration is to make a bold sketch from a photograph on a larger scale, then to take a negative of it the size required, and from that produce a transfer on zinc, and then etch in the ordinary way. Of course the likeness, under these circumstances, is dependent upon the skill of the draughtsman who copies the original photograph. Some of these type blocks are produced in a couple of hours or so, the electric light being used for making the negative as well as printing the transfer. A good, cheap, and expeditious method of producing phototypic blocks in half tone, which can be worked in an ordinary newspaper machine with type, is yet a *desideratum*.

INTENSIFICATION.

MR. HENDERSON'S remarks in the discussion on my paper read before the late Convention afford me an opportunity of supplying an omission which occurred in the hurry of writing. As Mr. Henderson pointed out, the application of the solution of alum and hydrochloric acid to a plate that has been intensified with silver would have a tendency to form chloride of silver in the film. This is precisely what is required, but the omission consisted in not directing the subsequent use of hypo—a second fixing operation, in fact. I have not the reference by me as I write, but I think this has been more than once mentioned in the pages of the JOURNAL when the subject of silver intensification has been on the *tapis*.

With regard to the possible effect of any chloride of silver so formed if left in the film, I am not inclined to think it would prove

very dangerous, the actual quantity being so infinitesimal. I have never intentionally made the experiment of testing the stability of a negative in which the minute trace of chloride has been allowed to remain, but it is very possible that amongst the silver intensified negatives in my possession there may be some in connection with which the second fixing operation has been neglected; still, I have noticed none that show any signs of discolouration so long as they have received the acid and alum treatment.

As a matter of fact, the quantity of silver remaining in a gelatine film after intensification and washing—other than that actually forming the image—is so infinitesimally small that its conversion into chloride produces no visible effect, and any change that may take place in that minute—nay, invisible—quantity of the haloid under the action of light, may, I think, be awaited with tolerable equanimity.

Not so, however, if the silver be *not* converted into chloride. All who have worked with gelatine emulsions or gelatine printing processes in which silver is the sensitising agent, are aware how tenaciously gelatine and free, or soluble, silver salts cling together. Whatever may be the nature of the combination, it is found practically impossible to remove silver nitrate from gelatine with which it has been in contact by mere washing. In like manner it is impossible to wash off the effects of contact with silver solutions from the hands or linen, even though water be copiously applied at once and before any sign of stain has appeared. In time, and especially on exposure to light, the inevitable stain will appear, from which it would seem that some insoluble organic compound of silver is formed.

If such be really the case, the proportion of silver in the compound must be small and the bond of union between it and the organic matter extremely feeble, for the application of a weak solution of a soluble haloid effectually prevents any subsequent discolouration, and in the case of a thorough preliminary washing the quantity of silver haloid formed is insufficient to produce any appreciable discolouration upon subsequent exposure to light. The difference in the colourific powers of the organic and haloid silver compounds is, in fact, most remarkable, and it is in order to counteract the strong tendency in this direction of the former, by converting it into the latter, that the alum and hydrochloric acid are applied to an intensified film.

In the early days of gelatine emulsion photography, it was by no means unusual to meet with formulæ in which the emulsion, previous to washing, contained an excess of silver nitrate—a state of affairs entirely unknown at the present day. The reason of the relinquishment of the excess of silver was not so much that emulsions so made would not work well, as that they were found not to keep—or rather that the dried films would not keep. I remember several years ago, at a meeting of the Photographic Society, Mr. Herbert B. Berkeley exhibited a number of negatives and unexposed plates bearing directly on this question. The emulsion had been made with excess of silver, and the plates when newly prepared gave unexceptionable results, as was proved by the sample negatives handed round. But upon opening a packet of the same plates, after keeping with all care for a few months, they were found to have developed, spontaneously, a deep red stain, and to be wholly useless for photographic purposes.

At that time I made some experiments upon gelatine films which had contained free silver, the latter being washed out as perfectly as possible. Plates coated with emulsion and also with plain gelatine solution so treated, were dried and a portion of their surfaces then soaked in a five per cent. solution of potassium bromide, the whole again well washed and redried. In the result, after keeping carefully wrapped up for some months, protected from light and damp, all such plates were found to be more or less discoloured in those portions not treated with potassium bromide. The plain gelatine films exhibited a clear stain, varying from a yellowish to a brownish red, the parts treated with bromide remaining perfectly colourless and transparent.

For these and other reasons I do not anticipate that the omission of the second fixing operation is likely to cause a great amount of trouble, though under some circumstances, as for instance a prolonged or forced intensification, a sufficient quantity of silver might be left in the film to produce a visible veil when the plate is placed in alum and acid. In such a case the second fixing would be imperative.

In conclusion, it is possible that objection may be taken to the second fixing operation and its concomitant troubles of washing, &c. To reduce these troubles to a minimum, I would suggest the replace-

ment of hypo by sulphite of soda in strong solution, as proposed by Captain Abney. The lower solvent power of the sulphite as compared with hypo would be of little moment in the presence of so small a quantity of chloride of silver, while the comparative harmlessness of the silver products, and the absence of dangerous reactions with the alum and acid, would prove advantageous in reducing the trouble involved in the different washings.

The latter trouble might probably be still further minimised by combining alum, chloride of sodium, and the sulphite in a single bath for application after intensification.

W. B. BOLTON.

CONVENTION JOTTINGS.—IV.

(From our Special Correspondent.)

THE Thursday's trip was by the "Columba," sailing down the Clyde, through the Kyles of Bute, as far as Tarbert, where it was arranged Mr. John Stuart would take the Convention group during the two hours' stay there. When we got up in the morning it was drizzling and wet, and the outlook for a good day was anything but propitious. Many of the party went down all the way by boat, and others took train an hour later for Prince's Pier, in time to catch us up at that point. By the time that they bearded us the sky had cleared a bit and things looked more hopeful.

When we reached Rothesay, an hour later, the sun was out in all its glory, and so were the cameras—which seemed to have hung fire up till then. The wet morning had kept back many of the regular tourists, and our company had pretty much the run of the boat. Cameras could be seen about everywhere, from 15 × 12 size down to one as small as an ordinary watch. The detective element was in great force, and shots were being fired at every little knot of people on board, so that many recollections of the day were carried away, the success of which will depend on future development. When we arrived at Tarbert, we all gathered together at the large rock near the mouth of the harbour to have the Convention group taken by Mr. John Stuart, and when we got all in mass there really was some doubt regarding who was the manager of the posing of the picture, suggestions were so many and varied; but Mr. Stuart quietly waited till the fizz subsided, and then he had everything his own way. Cameras big and little to the number of twenty or thirty were ranged along either side of Mr. Stuart's big one, and all got a chance of a shot before the company separated—so that there should be no lack of groups of the Convention this year.

Then came the scamper over the shore in all directions to fill up the time left, photographing little bits each on his own account.

Mr. Sail, from Belfast, was kindly informed by a young native that the roads would be found fine and level for his machine; he evidently thought it was a bicycle.

On the return journey some highly successful groups were taken on board the "Columba." After a very enjoyable day, the company reached Glasgow in good time for the evening meeting.

The trip to Edinburgh took place the following day, Friday, and of all the excursions for which the Glasgow Convention will be famed, that to Edinburgh deserves special notice. From fifty to sixty of our members found themselves at the railway station in the morning *en route* for the Modern Athens, escorted thereto by some of the Glasgow brethren whose avocations did not permit of their accompanying the party on this occasion. Special carriages had been attached to the train for the party, and in due course we were whirling eastward at express speed. Of the fun that took place on the journey it were superfluous to speak: given a large party of photographers on pleasure bent and in the most boisterous of spirits, a calm, sunshiny day, rushing along through a lovely country at forty miles an hour, and you can well understand the rest.

A wag in our particular carriage undertook to point out the historic scenes through which we were passing, and (for this occasion only) imported into the vicinity of the track localities famous in the national history. "Here," he exclaimed, pointing to a rivulet, "is the Till, and on yonder field adjoining was fought the disastrous battle of Flodden, at which Sir William Wallace routed the forces of Percy of Northumberland." A turnip field near Falkirk served in like manner to do duty for the field of Bannockburn, from an adjoining height backing which "King James did rushing come." Even Ben

Nevis was, for this special occasion only, brought into the scene among the Pentlands on our south. What with veritable Scottish history of this kind, "Nap," discussions on photography and everything else, the time passed so pleasantly that the old-time cry of "Bonnie Edinburgh, I smell ye noo!" was received as a joke, which was, however, dispelled by the appearance of Donaldson's Hospital and the phalanxes of solid stone houses which usher in the Modern Athens from the western approach.

On our arrival at the Waverley Station we had a right royal welcome from several gentlemen, representatives of the Edinburgh Society, who were waiting to receive us, including Messrs. W. Forgan, C. Fraser, W. Crooke, J. Crichton, G. G. Mitchell, W. T. Bashford, J. M. Turnbull, and T. Wandale. Brakes were in attendance, and our friendly conductors embarked us at once, and away we drove over the most beautiful of cities. The Calton Hill was the first point of interest we visited, the view from which is magnificent—but Edinburgh is highly favoured with spots of vantage-ground rising every here and there from which all its beauties may be seen and admired.

We then went on to the Castle by Princes-street. When at the Castle Mr. Millington secured a fine negative of Andrew Carnegie sitting in his carriage. This was a fortunate shot, for it was taken at the time when Mr. Carnegie was enjoying the honour of the freedom of the City of Edinburgh, which the citizens had conferred upon him as some slight acknowledgment of their gratitude for the £50,000 he had gifted to Edinburgh to institute a free library in the city. From the Castle we drove down the Castle Hill, High-street, and some of the older parts of the city, whose old and broken walls breathe history. Some photography was done at the White Horse-close which was both interesting and amusing. Holyrood Palace was our next halting-place, after which we drove round the Queen's Park to Craigmillar Castle, where a sumptuous repast was served up by our Edinburgh friends, spread out picnic fashion, and, oh! didn't we enjoy it! J. T. Taylor proposed prosperity to the Edinburgh Photographic Society, and, dating back, he told them he remembered when it was very young indeed—he nursed it when a baby. Mr. W. Forgan replied for the Edinburgh Society, and expressed his pleasure at the success of the Convention. Then came the taking of the group by Mr. W. Crooke, who telegraphed to the Convention meeting the same evening that it had turned out all right.

During the day Mr. J. T. Taylor, and subsequently Mr. Henderson, of London, and Mr. J. Henderson, of Perth, paid a hurried visit to the veteran photographer, James G. Tunny, now lying waiting, it is to be greatly feared, the approach of the last messenger. Mr. Taylor, in subsequently speaking of this visit, said, "I found the giant prostrate in bed, paralysed from the chest downwards. He was evidently suffering great pain, but his eyes sparkled brightly when I told him of the Convention doings of the four days previous. Well I knew that of all the kind-hearted Edinburgh men whom I had that morning met, he, a member of the Convention Council, would have been the very foremost to give us welcome to the Old Dunedin but for his terrible affliction. After a brief time spent in converse we parted, each feeling that he would see the other no more. My acquaintance with this father of practical photography in Scotland dates from over a quarter of a century ago, and, taking him all in all, Tunny is a man whose like we ne'er shall look upon again."

After leaving Craigmillar Castle we drove through the meadows, on the ground of which the very successful Exhibition of last year was erected, thence by the Lothian-road, Charlotte-square, and George-street. We reached the Waverley Station, where, after many partings, we returned to Glasgow, having spent a day long to be remembered as one brimful of pleasure.

The Friday evening's meeting was full of work. After a very interesting paper on *Modern Film Photography* by Mr. B. Wollaston the tag ends of business and discussion were drawn together to bring matters to a close, this being the last night of open meeting. When nine o'clock rang out we all adjourned to the "Bath Hotel," where dinner was set for the members, who, as they sat round the table, looked, one and all, as if they had come to enjoy themselves. The chair was taken by Mr. John Stuart. Mr. W. Lang and Mr. J. T. Taylor acted as Vice-Presidents on the occasion. After the toasts of "The Queen," "The Amateurs," "The Profession," and "The Convention," we en-

joyed three hours of mirth and fun filled in with song and story. The time passed like an instantaneous exposure, and one wondered how it had gone.

On Saturday morning the Council met at Cranston's "Waverley" to bring the business of this very successful Convention to a close. At the meeting fourteen names were added to the Council—and with regard to this there have been some questions raised about the sizes of Committees and Councils, and quite an unnecessary sneering at the largeness of the same. It can be well understood that this carping is made by those who are not in a position to know anything about the matter, never having done any work for the Convention from the very first. The only thing they seem able to do is to sit and tell us it is all wrong. With some people everything is all wrong always. These are the sort of folk who, when they go to heaven, will catch cold passing through the clouds, and will insist, when they get there, that their "haloes" don't fit.

As a matter of fact the very magnitude of the local committee at Glasgow was the groundwork of the great success of the meeting, for the larger proportion of them were working members, and not names merely put down for a show. For the future guidance of our friends in the profession who have gone home to think over and provide for us next year, I would say, Have plenty of people on your local committee and sub-committees, and never think of limiting your working power because it might be thought too large for the subject in view. Believe me, you will need it all.

After the new members were added to the Council, a Sub-Committee was appointed to draw up a set of rules and regulations for the future guidance of the Convention, and votes of thanks were passed to all who had worked so hard and so well. Then the Convention meeting at Glasgow began to melt away; the business was scarcely done when some of the friends had to hurry off to catch the train for Granton, where the steamer lay that was to convey them to London. Saturday afternoon saw most of the company scattered; that same evening our party took the Midland train for London, some of the Glasgow friends meeting us at the station to see us away.

It seems that a few of the members did not leave bonnie Scotland so quickly, for some of them were seen enjoying the shows at Glasgow Fair in the beginning of the week following the Convention. The Land o' Cakes suited them. I have nothing more to say. The comings and goings, the concourse and intercourse, teach but one lesson, for "As iron sharpeneth iron, so a man sharpeneth the countenance of his friend."

ECHOES FROM THE SOCIETIES.

THE shutter introduced to the members of the Photographic Society of France by M. de la Baume Pluvinel is ingenious in its conception, and if not theoretically perfect would most probably be found to work well in practice if used with care. The main difficulties in its application, as I see them, are not touched upon by Professor Stebbing in his description of it. As I read that description, the shutter consists of a disc of metal pivoted in the opening of a diaphragm, and the exposure is made by revolving the disc a half turn by means of a projecting needle or wire.

Obviously, if this arrangement is to be inserted by the ordinary diaphragm slot, the construction must be of the lightest, and I should like to ask how the necessary accuracy of fitting and working can be secured with so little material to work upon. In the first place, to render the shutter light-tight when closed the metal disc must be ground into the diaphragm aperture without any flange or bevelling to make the joint secure, otherwise the disc will not revolve. Then if it be so fitted it will be too tight to work easily and without causing a jerk to the camera during exposure. It will be difficult, too, to provide any efficient catch to prevent the disc rebounding after the exposure is made, as well as to secure from such flimsy material sufficient strength to withstand the sudden shocks of instantaneous exposures. The fact that a portion of the lens remains covered during the exposure would not, perhaps, present any practical objections, but how does the inventor hope to provide against the revolving disc wearing bright, and thus transmitting reflected light on to the plate? The idea is good, but requires some remodelling to render it truly effective.

The pocket camera devised by the same gentleman is of a more practical character, and I am surprised the idea has not been seized upon for the same purpose sooner. It consists of an extending body fixed upon the springs of an ordinary "Gibus" opera-hat, which upon pressure immediately flies out its full extension. The focus of the lens must, of course, be selected to suit the length of the springs, and for objects at varying distances it will be necessary to provide means for altering the position of the lens itself to a slight extent as the camera body is unchangeable. Some years ago Mr. W. J. Allsup described in the ALMANAC an extending camera front on the same principle for occasional use when a specially long focus is required. This was extremely simple and portable, occupying very little room when not in use and giving an increased range of about seven inches at a second's notice when required. But somehow or other the idea was never taken up.

M. Darlot's "detective" camera, exhibited at the same meeting, has, we are told, the form of an elaborately got-up gentleman's leather dressing-case. It seems to me that the manufacturers or "inventors" of detective cameras are vying with one another in attempting to rob the instrument of its "detective" or secret character and to reduce it to the level of the ordinary London "D," who is said to be invariably recognisable at a glance. What would the public, the police, and the detectives themselves, think of a man who was seen dodging about, say, a Socialist meeting in Trafalgar-square, with an "elaborately got-up gentleman's leather dressing-case" in his possession? I imagine the crowd would be on to the camera before the camera could be got on to the crowd.

W. Vogel, jun.'s, toning process for gelatino-bromide prints, which was subsequently discussed, is not to my idea one to be recommended. It is many years since cupric chloride was put forward as a toning agent capable of, at least, partly taking the place of gold, and so rendering the toning of albumen prints less costly. But it was at once pointed out, by Dr. J. Emerson Reynolds I think, that the tones so produced were not permanent, that, in fact, the copper compound is soluble in sodium hyposulphite, and that therefore any alteration of tone produced by the copper disappeared in fixing, and the nett result was just what would be produced by the gold alone. A print coloured to the proper tint or tone desired in the combined gold and copper bath would therefore be entirely changed in colour in fixing, being reduced in fact to the condition of a half toned proof.

In the case of gelatino-bromide, though the toning is performed after fixing, I do not see how the result can be any better, for though the tone may be at first perfectly satisfactory, its permanence is extremely doubtful. If we have to search no further than to hypo for a reagent that will act upon it, I do not think that it will prove capable of resisting the thousand and one agents that combine to destroy images that hypo will not touch.

A great deal has been heard lately about processes for the so-called photography in natural colours. The daily papers have gone into raptures through their "scientific" leader writers, and have admitted a lot of utter rubbish written principally by interested parties. The photographic journals have endeavoured to show what the "processes" really consist of, and so far as the photographic fraternity is concerned have no doubt succeeded in the attempt, but to reach the great body of the British public is beyond their powers. The first verdict of a photographic body, publicly delivered, was given at a meeting of the London and Provincial Photographic Association, where a long and anxiously expected portrait specially taken to illustrate the "process" and the vast strides made in "photography in natural colours" was exhibited. The verdict, it seems, was "not complimentary to the artist or the process." So far so good; but, as was suggested, cannot steps be taken to prevent the publication, to a non-scientific public, of statements which really amount to misrepresentations?

Some mi-understanding appears to exist in certain quarters on the subject of the different processes which have recently been before the public, all being classed alike as sailing under false colours. It is only fair to point out that the promoters of one process who recently modified the wording of their prospectus because it was stated that the language used was likely to mislead, go further than that, and are prepared to show the whole working of the process to any one who may be interested; also that they do not claim that their method is anything but an improved colouring process.

Papers on art-photography seldom contain or elicit anything that is particularly new, the subject having been so very thoroughly threshed out. Mr. Dunmore's paper on *Photography Past and Present*, read before the North London Photographic Society, contained, however, many excellent suggestions, and, what is more, elicited one or two noteworthy remarks in the course of the discussion that followed. For instance, when Mr. Pringle, in discussing the art *versus* the technical sides of photography, said that "no picture was ever the worse for the negative being technically perfect," he summed up the whole matter in a nutshell. It is too much the habit of those who write and talk on such subjects to "take sides;" the man of artistic proclivities preaches art and scorns the technics, while the *photographer*—using the term as meaning one who exposes plates and mixes developers—believes in nothing that is not a perfect negative.

Then, again, Mr. John Nesbit touched the right string when he expressed himself dissatisfied with his recent work as compared with that of former days, because "he felt that he had not kept pace with the opportunities now afforded for attaining perfection." There again is a sentiment that modern photographers should take to heart! What would Rejlander's pictures have been had he possessed the advantages of modern gelatine plates?

I do not quite follow the next speaker's remarks, in the course of which he alludes to photographers as being unable to "keep their minds free from matters pertaining to the dark room" while they are composing a picture. It is, perhaps, impossible to expect all to be perfect or all alike; the man who makes a picture, which, as Mr. Pringle says, is also a technically perfect negative, is the man who dissociates his mind from technical matters when engaged on the art side of photography. The operator who muddles up the studio and the dark room, or who, as Mr. Mackie describes him, is slave to a particular form of developer, is merely a *photographer* in the mechanical sense I have described above. I am afraid the latter are in the majority.

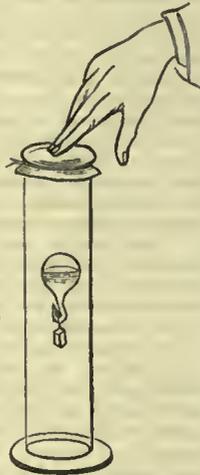
MONITOR.

ON A NEW PRINCIPLE FOR THE CONSTRUCTION OF PHYSICAL INSTRUMENTS OF QUANTITATIVE MEASUREMENT.

I.

THERE is a certain well-known piece of apparatus—a "philosophical toy"—to be found in most physical laboratories and elsewhere, which is known as the "Cartesian diver." It consists essentially of a hollow vessel partially filled with water and partially with air floating in a "glass," over the mouth of which an indiarubber or other elastic membrane has been stretched. This hollow vessel has a hole beneath, and is the better for having a weight attached to keep it right side up. It is so adjusted as to contain only just air enough to make it float. When pressure is applied to the elastic membrane a quantity of water is forced into the "diver," which accordingly becomes specifically heavier, and sinks to the bottom of the vessel in which it is contained. When the pressure is removed, the air within the "diver" expands to the volume it occupied before, forcing out again the water which made it sink, and the thing forthwith proceeds again to "swim." Such, at any rate, is the general theory of the affair, and though not quite so, it is substantially correct. Now, it must have occurred to Descartes (the inventor of it) that his "diver" presented the foundation of an instrument for the measurement of pressure, and this must have occurred to hundreds or thousands of others who have lived since Descartes died, two hundred and twenty-one years ago. Yet, so far as I have seen, it has not been applied for purposes of this kind until so applied by me. The difficulty of the thing is this: that a pressure sufficient to make the "diver" sink at all suffices also to make it sink to the *bottom* of the vessel in which it is contained, and a "levity" sufficient to make it rise at all also suffices to make it rise to the *surface* of the liquid in the glass. Temperature also affects the performance of the thing by contracting and expanding the volume of the air which it contains, with the results already given. Now, if the "diver" could be made to sink to depths which are definite and different under pressures which are definite and different too, it is clear that it could be made to measure any force translatable into pressure, as, for instance, temperature, electricity, mechanical motion, weight, elasticity, and the *radiant energy of the light of day*; and the thing in its various modifications could accordingly be used

as a barometer, a thermometer, a pressure gauge, a vacuum gauge, an ampère-meter, a voltmeter, a speed indicator, a balance for weighing, a measurer of elasticity, and (what interests the photographer most) a photometer as well, not to mention an anemometer, a chronometer, a tide gauge, a depth indicator, and a score of other things besides. It becomes, accordingly, a matter of philosophical importance that a solution of the problem should be found, and that we should have the means of making the "Cartesian diver" sink under definite pressures to depths which are definite too. This solution it has been my pleasure to seek, and my good fortune to obtain. Going more minutely into the theory of the "Cartesian diver" (which is here depicted), not only is a pressure which suffices to make it sink at all sufficient to make it sink to the bottom of the vessel in which it is contained, but in a certain sense it is more than sufficient for that purpose. For when the "diver" has sunk an inch, a tenth of an inch, or indeed any distance whatsoever, it is then subject not only to the pressure which made it sink but to the further pressure exerted by the liquid column beneath which it is submerged, and as this column increases with each increment of the descent, the "diver" reaches the bottom with an accelerating velocity under a pressure which is accelerating too, and when at the bottom the pressure of the liquid may in itself suffice to keep it there, even when the pressure on the elastic membrane has been removed.



In order to make the "diver" sink to a definite depth under a definite pressure, it is necessary that it should be relieved by the act of sinking of a portion of its weight greater than that of the water forced into it by the initial pressure which made it sink, and of the extra pressure of the liquid column which accumulates above it in the act of sinking. In short, it should get rid of a quantity of weight as it sinks, because it sinks, and which accumulates as the depth increases and in consequence of that increase in depth. I have adopted sundry devices for the accomplishment of this end; the first of these consisting of a chain of glass suspended from beneath the "diver" and reaching to the floor of the vessel in which it is contained, and on which it is deposited, link by link, as the "diver" is descending, and thus continually diminishing the load it bears at each increment of the descent and finding a different position of statical equilibrium for each pressure to which the apparatus is exposed. This result, however, obtains only under the influence of a constant temperature. In my next I shall proceed to show how the effects of temperature are nullified, or "compensated," and how the "Cartesian diver" is thus made into a true barometer, indicating the variations in the pressure of the outer air by the varying elevations at which it floats. This instrument, the "Cartesian barometer," is the foundation of all the other instruments I have already named.



D. WINSTANLEY.

CONTINENTAL PHOTOGRAPHY.

[Translations and Abridgments.]

PHOTOGRAPHY IN ANTWERP.

A MEETING of the new Section in Antwerp of the Belgian Photographic Association is reported in the June number of the *Bulletin* of that organization. M. Lunden presided, and among the matters of interest brought forward, M. Colon exhibited some prints upon albumenised paper of the ruins of Villers; these prints had been soaked, before the application of the mountant, in a bath of—

- Alcohol 4 parts.
- Glycerine 3 "
- Water 1 part.

They were then mounted, and the superfluous moisture removed by blotting-paper, after which they were dried in the open air. These

operations were performed to prevent cockling during drying; in fact, the prints, although of the whole-plate size, were perfectly flat.

M. Maes, the chief Belgian collotypist, then proposed that an exhibition of the works of the members of the Section should be held in Antwerp next October. This suggestion was favourably received, and its further consideration was postponed until a future meeting. M. Maes then described his method of collotype printing, which is essentially that of Poitevin and Albert, after which he conducted the members of the Section over his works, and finally presented each of them with a print of the Place Verte at Antwerp, which included the Cathedral and the statue of Rubens.

ONE OF THE FATHERS OF PHOTOGRAPHY.

In the same number of the *Bulletin Belge* is an article on M. H. Bayard, who has just died at the advanced age of eighty-one. The author says that little is generally known of Bayard's early work, much about which is recorded in a scarce book written by Blanquart-Evrard, of Lille, and published in 1869. Blanquart-Evrard says that Bayard was chief of the *Bureau* of the Minister of Finances, and in that time which he had to spare from his administrative duties discovered a method of taking camera images upon paper. His discovery was complete, original, and without knowledge of the results to be later divulged by Daguerre and Fox Talbot. Bayard was a modest man; he knew that his invention was not perfect. Unhappily for him he but exhibited the picture and did not describe the method: this was captivating the eyes instead of seizing the spirit. If he had made his method public, the name of Bayard would now be as well known as those of Daguerre and Talbot. It was in 1838, six months before the publication of Fox Talbot's process, that Bayard exhibited to M. Desprez, member of the Institute, and two months later to Biot and to Arago, his photographs obtained in the camera. On the 24th of June, 1839, at a public exhibition in aid of the sufferers from the earthquake at Martinique, he placed on view thirty of his proofs. The Parisian observers thought them curious. A few days afterwards Daguerre divulged his discovery and his method of working; there was general excitement, and, despite the report of M. Raoul Rochette to the Academy of Fine Arts, which report was published in the *Moniteur* of November 13, 1839, Bayard and his invention were left in the shade, and almost entirely ignored.

The following was Bayard's process:—

1. Soak the paper for five minutes in a twenty per cent. solution of eal ammoniac, then dry it.
2. Float this paper upon a ten per cent. solution of nitrate of silver, and dry it in the dark.
3. Expose the nitrated side of the paper to light until it is nearly black, but take care not to reach the bronzing stage. Wash then in several changes of water, dry, and preserve in a portfolio for use.
4. Soak the paper for two minutes in a four per cent. solution of iodide of potassium, lay the white side of the paper upon a smooth slate, and apply the solution to the dark side with a large sable brush; then expose in the camera. The light will whiten it in proportion to its local intensity.
5. Wash the proof in several changes of water, then soak in a bath containing equal parts of water and ammonia, finally wash again in water, and allow to dry.

This article has appended to it in the *Bulletin Belge* the initials of M. A. de Blohouse, Vice-President of the Belgian Photographic Association.

PHOTOGRAPHY IN GERMANY.

At a meeting of the Berlin Society for the Advancement of Photography, the President, Dr. Vogel, announced that the Municipal Council of Vienna had contributed a subsidy of 35,000 florins for a Photographic Institute, of which Dr. Eder will be the director.—*Photographische Mittheilungen.*

PLATINOTYPY.

The son of Dr. Vogel has modified Léon Vidal's plan of turning the images on Eastman's paper into platinum, in the following manner. After development fix and wash, and place the images face downwards in the following bath:—

- Potassium chloroplatinite 1 gramme.
- Distilled water 1000 grammes.
- Pure hydrochloric acid 10 centigrammes.

The prints should be left in the above for twenty minutes, then rapidly washed, and placed in a solution of chloride of copper; the silver of the image is then changed into chloride of silver, and the image takes a brown tone; if it looks too pale it can be darkened again with the oxalate developer; all this may be done in daylight. It can be afterwards further strengthened if necessary. Next fix to remove the excess of chloride of silver, then soak the print for five

minutes in a bath of alum and hydrochloric acid. Wash finally for fifteen minutes.—*Photographische Mittheilungen.*

INTENSIFICATION WITH PERMANGANATE OF POTASH.

M. Alf. Gendraud states that one day he placed a positive made by contact printing, and developed with ferrous oxalate, in a solution of permanganate of potash, in which it took a villainous brownish yellow colour. Merely as a whim he then poured a little iron developing solution over it; the positive immediately turned brown, the whites became clear, and the image had altogether become vigorously intensified. He repeated the experiment with another transparency, to which he gave longer immersions, and the intensification was most energetic, without degrading the whites.—*L'Amateur Photographie.*

IDENTITY OF THE PHOTOSALTS OF SILVER WITH THE MATERIAL OF THE LATENT PHOTOGRAPHIC IMAGE.

In the first part of this paper I described certain strongly coloured forms of silver chloride, bromide and iodide, obtained independently of any action of light, for which I proposed the name of photosalts, by reason of their identity with the products of the action of light on the normal silver haloids, both with the substance of the latent image itself and also with the principal results of the continued action of light on these haloids. It remains to prove this identity. First, as to identity with the product of the continued action of light.

If we expose silver chloride precipitated with excess of HCl to light, we get a deep purple-black substance which boiled with dilute nitric acid gives up a little silver, at the same time somewhat lightening in colour and forming a dull purple material which closely resembles some of the forms of photochloride described in the first part of this paper, most those produced by the action of sodic hypochlorite or of ferric chloride on metallic silver; it shows the same reactions with ammonia that they do. The brighter coloured photochlorides are not formed by the action of light on silver chloride. But these brighter coloured chlorides can also be shown to be formed through the action of light. Most salts of silver darken by exposure, and when these dark products are treated, first with HCl, and then, after thorough washing, are boiled with dilute nitric acid, we can obtain results perhaps as varied as those which I described in the former part of this paper as arising from purely chemical action.

Silver oxalate exposed for two days to sunshine, covered with water and with frequent agitation, changed to a deep brownish black, which by treatment with HCl became a little lighter. When this product was washed and boiled with strong nitric acid, it acquired a fine deep coppered colour, the acid taking up silver. This red substance dissolved in ammonia readily, leaving a small amount of black residue; the same with sodium hyposulphite.

(This examination, made a year ago, has recently been repeated with a view to obtaining a quantitative determination of the proportion of Ag₂Cl contained in the red product. The exposure was for about a day; the oxalate at the end of the exposure seemed absolutely black. After treatment with HCl it assumed a purple-black shade. After thorough washing and boiling with dilute nitric acid, which removed a large quantity of silver, perhaps twelve or fifteen per cent. of the entire quantity, it had a fine lilac-purple colour. Analysis showed that it contained about one-half of one per cent. of subchloride, or more exactly, 0.45 per cent. Ag₂Cl was found.)

The red chloride thus obtained from silver oxalate not only closely resembles the red chloride obtained by means exclusively chemical, but shows the same behaviour to reagents.

Treated with ammonia it dissolves, leaving a black residue. The formation of this residue takes place precisely in the same manner with both substances. As fast as the material dissolves the liquid becomes clouded and an extremely fine black substance seems to form within it, which gradually falls to the bottom.

Treated with solutions of the alkaline haloids, the red chloride derived from exposed silver oxalate remains unchanged after twenty-four hours' contact with potassic chloride, and becomes paler and more lilac under potassic bromide; under potassic iodide it becomes grey. These reactions correspond with those of the photochloride.

Silver phosphate belongs to the more sensitive silver salts and easily darkens in sunlight. In a few hours it becomes greenish all through, after which further exposure produces little visible effect. This product becomes with HCl quickly grey, and by treatment with nitric acid after washing, light pink.

Silver tartrate by exposure to sun became quite black. With HCl this changed to reddish grey or dull pink. This product well washed and let stand with cold nitric acid 1.36 became first lavender and then light pink.

Silver carbonate by prolonged exposure became greenish black, and with the above treatment yielded a dull pink photochloride.

Silver pyrophosphate, even by several days' exposure to winter sun, did not blacken, but assumed an ochreous or buff shade. With HCl this passed to a sort of salmon pink, and by heating a few minutes with dilute nitric acid, to a beautiful copper shade.

Silver acetate was singularly little affected by sunlight; it looked blackish, but on closer inspection was found to be very little altered. By the same treatment as above it yielded a pale pink photochloride. So far as examined, all silver salts thus treated yielded pink or red photochloride.

These facts may serve to show the identity of the photochloride with the principal product of the continued action of light on silver chloride and on other salts of silver, subsequently converted into chloride. I should wish, however, to use this word identity in a somewhat limited sense. When the photochlorides are formed by different methods without the aid of light hardly any two forms can be considered absolutely identical: they differ in colour and in proportion of subchloride, as already often mentioned, but they also differ in other respects, especially in resistance to reagents. Some forms are far more easily destroyed by nitric acid: those obtained by the action of sodium hypophosphite (as presently to be described) are amongst the most easily destroyed by nitric acid. There is variation, too, in the degree of their resistance to ammonia. Very similar differences are found in the stability of the photochlorides obtained by the action of light: some are much more readily attacked by nitric acid than others. The product obtained by the action of light on silver chloride resists ammonia more strongly than that obtained by the action of HCl on exposed silver oxalate. This last is quickly attacked. Generally, I think the dark-coloured forms are the most stable. At a future time it may perhaps be possible to distinguish more exactly between these varieties.

I next pass to the consideration of the identity existing between the photosalts and the material of the latent image. Before entering, however, on that matter, it is necessary to describe a reaction leading to the formation of these photosalts, somewhat differing from the reactions already mentioned, and which has important bearing on the subject.

The remarkable action which an alkaline hypophosphite exerts on salts of copper was described many years ago by M. Wurtz. Its action on silver salts, though there is no parallelism between the two, has enabled me to find a key to some of the great difficulties of the latent image. A dilute solution of sodium hypophosphite if poured over a mass of chloride, bromide, or iodide of silver, formed in the absence of light, produces no visible effect, but has the property of bringing those substances into the condition in which they exist in the latent image. Applied in strong solution and with the aid of heat, it produces brown-purple photochloride, bromide, and iodide of silver. I will here briefly describe the first of these compounds in order to continue the series of photochlorides, and then pass to the consideration of the latent image.

Photochloride of Silver by Sodium Hyposulphite.—Silver chloride freshly precipitated with excess of HCl and well washed, placed in a flask with a strong solution of sodium hypophosphite and heat applied, begins to darken before the boiling point is reached. Actual boiling for ten or fifteen minutes gives a deep chocolate colour. This product well washed, and freed from traces of metallic silver by cautious boiling with very dilute nitric acid, has a pink, red, or brown colour, varying in intensity according to the length of the action. Sometimes a lavender shade is produced, and this is more apt to be the case when the silver chloride has been precipitated with excess of silver nitrate instead of excess of HCl. Silver determinations of two specimens of the purified product were made, indicating the presence in one specimen of 1.77 per cent. of subchloride; in the other of 3.53. By the continued action of heat for many hours a complete reduction to metallic silver takes place. Photochloride obtained in this way has generally a brown or dull purple colour. Boiled with nitric acid, it is apt to break up in as many minutes as some other forms would require hours for decomposition, yielding white chloride, whilst the nitric acid takes up small quantities of silver.

IDENTITY OF PHOTOSALTS WITH THE MATERIAL OF THE LATENT IMAGE.

It is proposed here to show: 1st. That in the entire absence of light, sodium hypophosphite is able to affect a sensitive film of silver haloid exactly in the same way as does light, producing a result equivalent to a latent image formed by light, and capable of development in the same way as an actual impression of light. 2nd. That these two effects, the impression produced by hypophosphite and that by light, comport themselves to reagents exactly the same way, and seem every way identical. 3rd. That the image produced by hypophosphite on silver chloride always gives rise to a positive development, but on silver bromide may give rise either to a direct or to a reverse image, both of these effects corresponding exactly with those of light. More than this, sodium hypophosphite may be made to reverse the image produced by light on silver bromide, and conversely light may be made to reverse the action of hypophosphite. So exact a correspondence in these remarkable properties can scarcely be fortuitous.

I.

A silver haloid formed in the absence of light and subjected to the action of sodium hypophosphite gives rise to the gradual formation of subsalt, which combines with the normal salt in the manner described in the previous part of this paper. This action of the hypophosphite closely corresponds with that of light. In its initial stages it is invisible, but can be brought out, in both cases by development. If we form a film of chloride, bromide, or iodide of silver, and with a glass rod dipped in solution of hypophosphite make marks upon it, these marks can with

the utmost ease be developed in precisely the same way as an image produced by exposure to light.

A very simple mode of operating consists in imbibing photographic paper with a solution of an alkaline haloid, drying, applying a silver solution, and then thoroughly washing, all of course with careful exclusion of active light. If the silver solution is acidulated with nitric acid, a drop to the ounce, the result is brighter, but this is not important. In any case the washing must be thorough.

Marks made on this paper can be developed with the oxalate developer with the utmost facility. If a strong solution of hypophosphite is applied cold, it may be washed off at the end of a minute, but a stronger impression is obtained by allowing it to wait a half an hour before developing. Or the action may be accelerated and increased in strength by laying the freshly marked paper on a hot surface, or better, by steaming it, before applying the developer. A convenient mode of steaming is to lay two pieces of glass on a small water bath kept boiling, with a space between them. Over this space the paper is rested for two or three minutes. Paper prepared with a solution of KCl, KBr, or KI, dried, and floated on acidulated solution of silver nitrate and well washed, if marked with strong solution of hypophosphite and steamed for two or three minutes, will develop the marks as black as ink on a white ground. The use of heat simply gives a blacker development, but a very vigorous image may be got without. (A similar result may be obtained by substituting for the hypophosphite a dilute solution of potash and an oxidable organic substance. With milk sugar the action is very energetic and heat is quite superfluous.)

Both these are the initial steps of reactions which when prolonged result in the visible formation of the coloured photosalts. It is a matter of interest that sodium hypophosphite, which produces the above-described effects, has no developing power whatever.

II.

The two impressions, that formed by light and that by hypophosphite, are similarly affected by reagents. As an example of this identity of effect produced on the two impressions, I first take the action of nitric acid.

Chloride, bromide, and iodide papers were exposed to moderate diffuse light under a screen with openings, for a proper time to form a latent image, the chloride and bromide for four or five seconds, the iodide for twenty or twenty-five. They were then cut into halves and one-half of each was soaked in strong nitric acid for five minutes. These halves were then washed for some hours, and were developed along with the halves not so treated. Result was, latent image on silver chloride almost if not quite uninjured; on silver bromide, somewhat affected but still strong; on silver iodide, entirely destroyed. Similar portions of the same papers were then marked with hypophosphite, and were cut into halves and one-half was subjected to the action of nitric acid in exactly the same way as the previous. The result was exactly as before. The hypophosphite marks on the half of the chloride paper that had been treated with acid came out in development as vigorously as on the half that had not been treated. The bromide paper showed the marks weakened by the acid but still strong; on the iodide not a trace appeared. In all respects the result was the same—what the one resisted the other resisted, what destroyed one destroyed the other.

Another confirmation is presented by the action of the alkaline haloids upon the latent image. The latent images produced by light on chloride, bromide, and iodide of silver, were all treated with cold and moderately strong solutions of potassic chloride, bromide, and iodide for half an hour, and were then subjected to development. It was found that all three silver salts bore the action of potassic chloride and bromide fairly well, the images were somewhat weakened but strong developments were obtained without difficulty. But when potassic iodide was applied the latent image was totally destroyed. The visible effect of the alkaline haloids on the photosalts exactly corresponds with their action on the latent image. Potassic chloride and bromide applied in moderately strong solution and cold have little effect, but potassic iodide quickly destroys them.

Therefore the action as well of nitric acid as of KCl, KBr, and KI, is exactly the same on the latent image impressed by light on AgCl, AgBr, and AgI, as it is on the corresponding photosalts.

III.

The impressions produced by alkaline hypophosphite upon silver chloride always give rise to correct images, darker than the ground on which they are formed. The same substance produces an impression on silver bromide which may by development produce either a direct or a reverse image. So that there is a perfect parallelism with the action of light.

The reverse action of light, sometimes called solarisation, shows itself as follows:—A film of bromide being exposed to light, part covered by an opaque screen, the exposed portion receives an impression capable of development, and this impression grows in strength to a certain point, then recedes and reaches a condition in which it is less susceptible of development than before exposure. All bromide films, even unexposed to light, will darken in a developing solution in time. The portion that under the action of light has reached the reversed stage resists the reducing action of the developer better than that which was not exposed at all, and, consequently, appears after development as light on a dark ground, and is, therefore, a reverse image. As to the cause of this action we are

as yet wholly in the dark. If the continued effect of light was simply to restore the affected part to its original state we might attempt an explanation by affirming that the continued action of light undid its own work. But the fact of the resistance to reduction being greater than before exposure shows that some as yet unknown action of light is in play. The reverse action cannot be due to oxidation, as has been suggested, because hypophosphite reverses and certainly cannot oxidise.

The reversing action of light on silver bromide finds its counterpart in the action of sodium hypophosphite. If we take bromide paper (it is immaterial whether in making it the bromide or the silver solution be applied first, but for these experiments on the reversal of the image it is essential that a pure neutral silver solution be employed, and that after the second solution has been applied the paper should be thoroughly washed, all the operations being of course performed by inactive light)—if we take such paper and make marks on it with a strong solution of hypophosphite, and then throw the paper into potassio-ferrous oxalate, we shall get a direct development; the marks will be stronger than the ground. If now we continually weaken the hypophosphite solution, we shall presently reach a point at which these marks are in development almost wholly indistinguishable from the ground on which they were made. But, continuing the dilution still further, we presently reach a point at which the marks reappear, but this time reversely; as lighter marks on a darker ground. This result is obtained with about a two per cent. solution; the first-mentioned effect comes with a solution of twenty-five or thirty per cent. So that according as we use the hypophosphite solution stronger or weaker we obtain exactly opposite effects. Here the parallelism is striking but not perfect—at least it remains to be explained why the action in the two cases proceeds in a reverse order. All the other reactions show a perfect identity. Time will also sometimes produce the same effect as dilution. Paper marked and put away for twenty-four or forty-eight hours, giving at first a direct image, may after that time give a reverse one. This effect is extremely uncertain and, I think, exceptional. I have kept very many pieces for periods, from a few hours to several weeks, which first and last gave direct images only; a few became reversed. But the experiment itself, the opposite effect of strong and weak solutions, is liable to no such uncertainty.

Again, we may make light and hypophosphite interact, and each reverse the other's action. To make hypophosphite reverse the action of light, I take a piece of silver bromide paper, expose it to the action of diffuse daylight for a few seconds, then taking it to the dark room make marks upon it with a glass rod dipped in solution of hypophosphite. On developing with potassio-ferrous oxalate the marks appear lighter than the ground. Or, what is perhaps more striking, we take two pieces of such paper, retain one in the dark room and expose the other from five to twenty seconds to diffuse light, then make marks on both with a glass rod dipped in strong solution of hypophosphite, and then, after allowing a few minutes for the hypophosphite to act, place them both in a solution of potassio-ferrous oxalate. The marks will develop, in the one case, as dark on a light ground, in the other (that exposed to daylight) as light on a dark ground. We have here made the hypophosphite imitate the action of light: it has reversed the image in the same way as would result from a prolonged exposure to light. It will next be shown that light may be made to imitate the action of hypophosphite and reverse the effect already produced by that or other reducing agent.

If we take the red or purple silver bromide, preparing it with exclusion of light, and the same precaution as in the case of a dry plate, and extend it over paper (it is best, though not essential, to mix it with a little gelatine to enable it to retain its hold on the paper in the subsequent treatment), dry it and expose it to light under a screen such a piece of opaque stiff pasteboard with openings cut in it: then apply potassio-ferrous oxalate, we shall obtain a very remarkable effect: all the parts exposed to light take a reversed development and appear as lighter spaces on a dark ground. And this goes so far that we may expose till we get a visible and quite strong image, darker than the ground, and yet in development this darker portion will come out lighter than the ground. Indeed, I have one specimen which shows almost white figures on an intensely black ground. Before development these light figures were brown, by exposure to light, on a rose-purple ground. I have seen few more curious results than this.

From the foregoing it follows that red bromide, notwithstanding its intense colouration, is in the same condition respecting light as normal silver bromide that has received an impression of light so strong that any further influence of light would cause reverse action, only that a vastly larger proportion of its molecules are affected. In the case of the latent image formed by light on normal bromide, it would seem that the particles affected, although numerous enough to serve as a basis of development, are still too few and too scattered to be visible or affect the colour. The photobromide, on the contrary, has its mass made up of them. Then if exposed to light the light carries them a stage farther—brings them to the reverse or "solarised" condition, and the parts affected by light develop less strongly than those not exposed. So light can act the part of hypophosphite and hypophosphite that of light, interchangeably; each can produce a direct action, each a reverse, and each can reverse the other.

It then appears that in all the numerous ways in which it is possible to compare the photosalts with the material of the latent image they are

found to be identical. The proofs based on development generally, and especially on the reversal of the latent image, seem very strong, and these receive additional support from the exact identity of reactions shown by the photosalts and by the material of the latent image. The question of the identity of the photosalts with the products of light on the silver haloids might perhaps be left with some confidence to the cumulative proofs here offered. But I hope to be prepared to give in the next number of this Journal additional evidence from a new direction.

—*The American Journal of Science.*

M. CAREY LEA.

PRINTING IN CARBON, AND OIL COLOURS, AND PHOTO-LITHOGRAPHY.

[A Communication to the Dorset Amateur Photographic Association.]

The subjects of printing in carbon and photo-lithography should be of peculiar interest to members of a Dorset Photographic Association, for though it is by no means a generally acknowledged fact, it is an undeniable one, that Dorset belongs the honour of the inventions.

I propose to-day, at your invitation, to give you some account of these discoveries and of the steps which led to them. I shall illustrate the remarks I have to make with specimens of earlier and later work done by them, and I propose further to add some particulars of a later and most important discovery made by their inventor, of a method by which prints can be produced in oil colours. The process is at present a secret, but I shall be able to show you results produced by it which will prove to you its great value. Had the process been taken up some years ago, in all probability it would have revolutionised the art of photographic printing, for the process is exceedingly simple—prints of every gradation of tone and colour can be readily produced by it. Moreover, the prints are permanent to a degree that no other photographs are, for they are capable of resisting tests so severe that no prints by any other known process could stand them. The process is far in advance of that which the editor of one of the principal photographic papers of the day stated would, if discovered, "be one of the greatest discoveries photography has ever known."

I made the acquaintance of the inventor, Mr. Pouncy, of South-street, Dorchester, some time before he applied himself to the solution of this problem—the "philosophers' stone" to photographers of that day. I was a constant visitor to his studio and laboratory. I followed with interest the development of his invention, and experimented myself in the same direction, and thus gained a practical acquaintance with the subject. About the time Mr. Pouncy commenced his experiments, photographers were beginning to find out that silver prints contained in themselves the elements of decay, and must ultimately fade, and were looking out for some process by which photographs might be produced in permanent colours. Amongst other chemical substances from which more reliable results were hoped, carbon naturally suggested itself as one of the most suitable; for carbon is the most durable of all chemical matter, it combines with oxygen alone, and with that only at a very high temperature. But whilst chemists were looking forward, and scarcely hopefully, to a time when photographs might be produced in carbon, and photographers were beginning to interest themselves in the search for this, the photographic philosophers' stone, Mr. Pouncy was already far advanced with his process.

In 1838, Mr. Mungo Ponton made the discovery that bichromate of potash was capable of producing under the action of light a photographic image, and by its means he produced the first fixed photograph. The colour of the print was not satisfactory, and Mr. Ponton tried to improve it by staining the solution, and with the addition of sulphate of indigo he succeeded in obtaining a picture in various shades of green. Mr. Ponton's experiments may have suggested to Mr. Pouncy the possibility of obtaining a permanent print by the use of the bichromate of potash, though he adopted altogether a different line in his use of it. The first idea which occurred to him was, that since bichromate of potash, under the action of light, would produce a photographic image, it might in combination with carbon fix that also. He mixed carbon with his bichromate, applied it to paper, and for the first time a black surface instead of a white one was used to print upon. After many experiments he found that the black surface did not prevent the light from operating, and that a picture could be obtained. This was an important point, but the experiments did not result in a satisfactory print, for the carbon washed up in developing; some cement was required to unite the carbon and the bichromate. Amongst other substances treated for this purpose were gelatine and gum arabic, and, at length, by means of the latter, satisfactory prints were obtained.

I would here remark that Mr. Pouncy preferred gum arabic to gelatine as a cement for the carbon, mainly because he was from the first in search of a photo-lithographic process, and gum arabic, which is largely used in lithography, afforded for that reason the surest promise of success. In photo-lithography there was also the fact which might have had some weight with him, that the gelatine print required the assistance of a brush in development, or at least the use of hot water, whereas the gum arabic print could be developed by the use of cold water alone simply poured over the print. But I should like to make it clear that Mr. Pouncy did produce carbon prints from the first by the aid of gelatine as well as by the use of gum arabic.

Early in March, 1858, Mr. Pouncy sent two prints by his new process to the Editor of the *Photographic Notes*, one a copy of an engraving of Captain Cook, the other from nature, a photograph of Bingham's Melcombe. These, the first carbon prints ever exhibited, were received by the Editor on March 5. The Editor considered the matter of such importance that he forwarded the prints to H.R.H. the late Prince Consort through his private secretary, Dr. Becker. Dr. Becker, in a note from Osborne dated March 15, 1858, stated that he had shown the prints to His Royal Highness, "who thought them very remarkable and representing a most important step in photography." He further added, "The Prince will be glad to hear of whatever steps he (Mr. Pouncy) may take to make his discovery most generally useful."

I have the pleasure of showing you one of these original prints; you can therefore form your own opinion of them and mark for yourselves the high degree of excellence attained by Mr. Pouncy from the first, and you will not wonder that some persons refused to believe that they were carbon at all, but believed that they were silver prints on plain paper, and others that they were simply engravings. H.R.H. the Prince Consort subsequently subscribed £10 of the £100 asked by Mr. Pouncy for giving his process to the public.

The carbon prints first produced were deficient in half tone. You will understand why this was the case; the negative was placed over the black sensitised surface of the paper, a long exposure was required so that the light might penetrate to the paper support, or the colour would wash off in developing. For reproduction of a line engraving or any subject in black and white, this was of no consequence, but the prolonged exposure and the action of the light through the whole thickness of the sensitised composition over the shadows and half tints allowed of little gradation of tone.

Mr. Pouncy saw that in order to produce a print from nature with every gradation of tone, it was necessary that the light should act on the composition next the paper first. He therefore tried the effect of placing the negative at the back of the prepared paper. This had the desired effect; the print presented a granular appearance from the printing in of the grain of the paper, but the half tones were represented in every shade as in the negative, and the appearance of grain was subsequently reduced by the use of a thin paper previously prepared, or by rendering the paper transparent by means of Young's paraffine. This method of printing, however, introduced a new difficulty—the prints were reversed, the left side appearing on the right, the right side on the left. With a portrait this was not of so much consequence, but views of places became almost unrecognisable. The new difficulty was promptly met by an ingenious device. If you take a piece of sensitised albumenised paper and place it under a negative with the unprepared face to the negative, and print in the ordinary way, you will find a faint image on the sensitised face of the finished print, a rough image on the other, but on holding the print up to the light, you will find a perfect image in the substance of the paper, and a negative so made can be printed from either side. I show you a negative on albumenised paper made in this manner. Another and still more effective way of getting over the difficulty was to coat the negative with a solution of indiarubber in benzole, or some such solvent. When dry, a second coat was given. This was allowed to harden, when the corner of the picture was raised and the whole stripped from the glass. I hand you a film negative which I stripped in this way more than twenty-five years ago. It has been lying about since, and no particular care has been taken of it. It will give as good a print as ever. It might suggest a method of stripping gelatine films, though it must be remembered that there was much more in common between the collodion film and the solution of indiarubber in spirit than there is between the aqueous gelatine film and the solution in spirit.

I have previously noticed that the late Prince Consort gave £10 towards the sum asked by Mr. Pouncy for giving his process to the world. This was made public through the *Photographic Notes* towards the close of the year 1858.

The process is simple enough. It may be shortly described as follows:—Take equal parts of a saturated solution of bichromate of potash and of gum arabic made to the consistency of varnish. Add the fourth of a part of vegetable carbon ground very fine. Coat paper with the solution by means of a broad camel-hair brush, and expose the paper under the negative when dry for from five to fifteen minutes. To develop, soak in water, afterwards wash under a tap.

As to the permanence of the prints, at a meeting of the French Photographic Society in August, 1858, M. Giraud stated that he had tested one of Mr. Pouncy's prints and found it to resist the prolonged action of concentrated nitric and hydrochloric acid, aqua regia, cyanide of potassium, and that none of these energetic agents affected it in the least.

I will show you some specimens produced by this early process whilst we go on to speak of photo-lithography. Notice in particular the carbon print of Melrose Abbey; it received the silver medal of the Edinburgh Society in 1863. The Committee sent down the negative to Mr. Pouncy, and were thus able to form an accurate opinion as to the capabilities of the process, as they could compare the carbon print with the silver prints made by themselves from their own negative.

Before commencing the account of the invention of photo-lithography, it might be advisable to give an outline of the art of lithography as it is commonly practised. The lithographic stone is rubbed down to a level

and smooth surface. The subject is drawn with greasy lithographic ink on prepared paper, the drawing is transferred by pressure to the stone, and is slightly etched in by a weak solution of acid. The stone is then washed and coated with a solution of gum arabic. Being of a porous nature, the gum is absorbed by the stone, except in those parts which are covered by the drawing in greasy ink.

A roller charged with printing ink is now rolled over the stone, the lines of the drawing receive the ink, the other parts of the stone, moist with the damp gum, reject it. Printing paper is now laid upon the stone and the whole subjected to pressure, after which the print is removed and the process of printing repeated.

I have noticed that Mr. Pouncy was in search of a photo-lithographic process from the first. In 1858 and 1859 he was working incessantly and laboriously, early and late, first at carbon printing, then at photo-lithography. With every advance in carbon printing he sought to make a corresponding advance in photo-lithography, and much of the experience gained in working the former process was useful to him in his experiments with the latter—the methods by which he obtained reversed prints and reversed negatives, for instance, were invaluable in the stone printing.

His first endeavour was to produce an image on the stone which should retain the printing ink from the printing roller passed over it, whilst the bare parts of the stone would reject it. Every experiment in this direction resulted in imperfect prints; there was a difficulty in fixing the picture on the stone so as to bear the wear and tear of printing.

About this time M. Poitevin—of whom we shall have to speak again—and possibly others were at work on photo-lithography. M. Poitevin was trying a secret process, but enough transpired to show those who were familiar with what had been already accomplished that success was not attainable in the direction in which he was working. He was, in all probability, using albumen, or some such substance, sensitised with bichromate of potass; he printed direct on to the stone, and from one fact which transpired that after five or six impressions the image rolled off in the printing, we gather that he was attempting to print as Mr. Pouncy did at first, from a *positive* image photographically fixed on the stone. The difficulty of fixing by means of photography an image which would print on the stone did not trouble Mr. Pouncy long, he overcame it by the most ingenious and simple means. The attempt to print from the *positive* image was a failure, because no substance could be used to form the picture which would unite with the stone so intimately as to bear the wear of printing. But why should he not throw a *negative* on to the stone, so as to leave the lines of the picture bare whilst covering all other parts of the stone? All that would then be necessary would be to pass the roller charged with printing ink over it, when all the lines of the picture represented in bare stone would receive the ink, whilst the ink would not penetrate to the parts covered by the negative, which might then be washed off, ink and all, leaving the picture in printing ink on the stone; the stone might then be etched in, gummied, and printed in the usual way. This was tried and was completely successful.

The lithograph I hold in my hands is one which was issued and presented with the *Photographic Notes* of December 1, 1859. It appears to be a copy of one of Albert Durer's prints. It is not the best specimen of Mr. Pouncy's work at this time, but the Editor wished to print a specimen with that number of his paper, and as the time was limited, Mr. Pouncy printed a stone which had this picture upon it, and which first came to hand.

W. MILES BARNES.

(To be continued.)

SOME PHOTOGRAPHIC HERESIES.*

LET us take a comprehensive view of this subject, and see how it looks from a distance in a good light. The universe, and all contained therein, visible and invisible, has to be photographed. Who is to do it? We professionals cannot begin to do it; it is much too large a contract. Then what are we to do? Are we to be like dogs in the manger, or cheerfully recognise the valuable service our amateur brethren are rendering in this work? How much do you think of the work done by amateurs would come to the profession? Less than one-tenth; that is to say, more than nine-tenths of the work done by amateurs would never be done if they did not do it. Then let us not forget the splendid services amateurs have rendered the art-science in the past. Surely they have earned their diploma. Then away with petty jealousies and such old cries as "The craft is in danger!" If the craft is in danger, it is from within, and not from without; and it will generally be found that the most jealous are the incompetent—those who have no special skill to rely on.

There is a general superstition in the profession that a north light is a necessity for a portrait studio. In fact, I very much doubt if there is a south skylight in this city. See the trouble they have gone to all down Arch and Chestnut streets to obtain a north light; they have had to either build over two houses or spoil the length of the studio. Now, I have worked under many skylights, and prefer a south light every time.

* Concluded from page 459.

Speaking of portraiture, a portrait combination lens is supposed to give great roundness of image; of course opticians favour this view, as well as many photographers. My opinion is, it is a question of lighting, and has little or nothing to do with the lens.

Mr. Burton has lately been finding fault with the term "depth of focus," but he does not suggest a better. He says it is impossible that more than one plane can be perfectly defined at once by any lens, no matter how small the diaphragm used. Truly, we are getting things down very fine. Why did he not go further, and object to the term "flatness of field," because no lens has a perfectly flat field? Why did he use the term "perfect definition," when he knew that the correction of all photographic lenses is a compromise, and that the photographic lens has not yet been made perfectly free from astigmatism? Consequently, there is no such thing as perfect definition. I notice some writers on photographic optics have lately been using the term "penetration;" but is it any improvement on "depth of focus?" I think not; besides, it is not nearly so expressive. The English language is a very good one, but, like many other things, is not quite perfect.

Another heresy of mine is that every live photographic society should have a standing committee, which may be called the "Research Committee," composed of three experts, who should, if possible, be, either individually or collectively, skilled in photographic chemistry, photographic optics, and mechanics, with power to add to their number for special work. They should report at each monthly meeting on such matters as might have been referred to them, or in their judgment they may deem worthy of investigation. One part of the order of business should be "Report of Research Committee." A question may be asked which no one is able to answer, such as, "Is chloride of sodium a restrainer or an accelerator?"—referred to the Research Committee. An optician brings out a new lens or a new invention, or a plate maker a new plate, for which they claim certain possible or impossible qualities. Knowing a society has a competent Research Committee, samples are forwarded for examination, and the reports of such committee would be of great value to the members and the photographic world.

I have heard it stated, on good authority, that a diaphragm which expands and contracts during exposure would not give good definition with a single lens, but having tried it I can say it is a mistake, for it does not injure the definition in the least, but improves it.

J. Traill Taylor, in a lecture on lenses recently, proposed as a corrector for single lenses a pair of common, cheap lenses, to be placed near the diaphragm; one a periscopic of short focus and the other a concave lens of the same focus. I have tried it, and having no focus it has no effect, as we might expect.* This gentleman is usually so very accurate, especially in optical matters, that I am the more surprised he should make such a suggestion without having first tested it.

I was speaking of this to a gentleman whom you all know, and he said, "Have you seen my plan of doing that?" I answered, "No; what is it?" He said, "You are aware that a square diaphragm gives cushion-shaped distortion." I replied, "I did not; but I did know that placing the diaphragm behind the lens gave that form of distortion." "Well," he said, "a square diaphragm gives it, too; now I make a round diaphragm, and outline a square outside of it, and in each corner of the square I cut out a triangular aperture, which will give a rectilinear picture." I tried the square diaphragm, and found it did not give the cushion distortion as stated, so did not think the other was worth trying, as the distortion is not influenced by the shape of the diaphragm but by its position. I think the single lens has a great future before it, however some may despise it.

One article of my photographic creed is, I believe in the capabilities of a plate of the most exalted sensitiveness, the largest diaphragm, and the shortest exposure that will give the amount of detail and definition desired.

CHARLES TRUSCOTT.

Our Editorial Table.

THE A B C GUIDE TO AUTOTYPE PERMANENT PHOTOGRAPHY.

London: The Autotype Company, 74, New Oxford-street.

STANDING on the shelves of our reference library is a series of six editions of prettily illustrated and lucidly written autotype manuals, each edited and revised in succession upon previous issues by Mr. J. R. Sawyer, the director of the works. To these we have had frequent occasion to refer when we were desirous of sharpening our mind in either the principles or practice of the ever fascinating carbon process.

The *A B C Guide to Autotype Permanent Photography*, by the same author, may be roughly stated to be a "boiling down"—a species of practical quintessence—of all that has previously emanated from this enterprising firm in the elucidation of pigment printing, and we

* The writer of the above has failed from lack of knowledge as to how such a combination should be used. The two supplementary lenses counterbalancing each other, or nearly so, little if any alteration will be made in the focus; but if correctly put together there will be so much marginal displacement as to secure, with absolute certainty, freedom from distortion. He must try again, and if he does so intelligently he will quickly assay what he has here said.—*Edw.*

are sorry indeed for the intellect of the man who, with such a "Guide" in his hands, could fail to produce excellent work.

Having devoted a few pages to the history of carbon, or pigment, printing, Mr. Sawyer, in what country newspapers would call a "few and well-chosen words," describes the various pigmented tissues manufactured, their colours and uses; passes on to the general principles of single and double transfer; and then, before the reader is well aware, he is in the midst of the manipulatory details of undoing the carbon roll as it comes from the factory, sensitising it, which is simplicity itself, drying, exposing to light, and afterwards developing the image.

After treating the details of single and double transfer on paper, our author then goes practically into the application of the process to opal printing and various other applications of the art, touching upon the printing-in of skies and backgrounds, transparencies and lantern slides, concluding by a treatise on failures and their remedies.

We cannot too strongly recommend this well-digested manual to all who desire to become acquainted with pigment printing. It contains two illustrations, one of them, a portrait, being from a negative by Byrne, of Richmond; the other, a photograph taken in the interior of the Autotype Works, showing the method of development.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 10,247.—"An Appliance to Facilitate the Accurate Placing in Albums of Photographs, Drawings, or Scraps." W. G. GREENWOOD.—*Dated July 22, 1887.*

PATENTS COMPLETED.

A NEW OR IMPROVED MACHINE FOR CUTTING PHOTOGRAPHIC AND OTHER GLASS PLATES.

No. 11,231.—BENJAMIN JOSEPH EDWARDS, The Grove, Hackney, London.—*September 3, 1886.*

I PROVIDE a table or platform of suitable size, upon which the sheets of glass to be cut are placed one at a time, and I make the surface of the table of two slightly different levels on either side of the line of cut, to facilitate the snapping of the glass, as described hereafter. At one side of the table I hinge a flap (one side of which forms a guide for cutting), and along the opposite side of the table I form a raised stop, upon which the flap rests when in use, just clear of the sheets of glass to be operated upon. At the end of the flap I form a second smaller flap, which may be hinged or made of some suitable flexible material, and on the under sides of these flaps I form suitable projections, which can be pressed upon the glass on either side of the line of cut, and thus by the aid of the inequality of the surface of the table snap the glass, in order to effect complete separation.

When the sheets of glass are to be bisected I fit a right and left-handed screw in the fixed bearings below the table, and upon it I arrange nuts equidistant from the centre, which travel horizontally to and fro along the screw (when turned by a suitable wheel or handle), thus pushing the sheet of glass into position and gripping it ready for cutting in the exact centre.

When the sheets of glass are to be cut to certain dimensions (not bisected) I make use of a similar platform or table, and on one side I fit a suitable sliding guide, which may be adjusted for various sizes by means of a scale or by a spring bolt fitting into notches or other convenient device. The sliding guide or fence is set at right angles to the stop or rest, against which the sheet of glass is placed, and the flaps being also at right angles to the stop, the sheet is cut square immediately on being placed in the machine without special adjustment.

By means of any ordinary hand diamond tool drawn along the edge of the flat above described the sheet of glass may be bisected or cut square to any required dimensions with great accuracy and rapidity.

As hand cutting is liable to failure from inexperience, carelessness, or other causes, I provide a frame or baseplate, which may be used in combination with the above-described tables, which are made interchangeable. To this frame or baseplate I fit grooves or guides along which the tables, which are furnished with corresponding guides or projections, are made to travel. At the far side of this frame I fix a standard or bracket, and in its upper end I form adjustable bearings to receive a rocking arm or lever (in one end of which I fix the diamond tool), and which may be regulated to give any desired pressure upon the diamond by means of sliding or adjustable weights, or by a spring, or by both combined. As a guide for the diamond tool I provide a wheel which I pivot in the end of the rocking arm, and then adjust the diamond so that the point shall project slightly beyond the rim of the wheel. When the wheel arrives at the edge of the glass the diamond is lifted by it into position for commencing the cut, and at the end of the cut it runs up a slight incline, formed on the flap, and is then drawn over by means of a small spiral spring or other suitable device on to the surface of the flap, upon which it runs during the return stroke, keeping the diamond entirely off the glass; at the hinge end of the flap a suitable guide conducts it again into position for cutting.

IMPROVEMENTS IN APPARATUS FOR PRESERVING AND CHANGING SENSITIVE PLATES USED IN PRODUCING PHOTOGRAPHIC PICTURES.

[Communicated from abroad by Messrs. Koppe & Moh, of Goerlitz, in the Empire of Germany, Manufacturers.]

No. 6032. EDMUND EDWARDS, 35, Southampton-buildings, Chancery-lane.—*April 25, 1887.*

This invention relates to the apparatus used for obtaining photographic pictures upon what are known as dry sensitised glass or other plates, and more

especially to apparatus by means of which such plates can be changed when required, a fresh sensitive plate being substituted for one which has been exposed in a camera and a picture obtained upon it.

It has for its object a novel method of constructing and using such apparatus, so that it is light, cheap, and easily used, whilst it occupies little space, separate dark slides for each plate being dispensed with.

For this purpose a bag is used, of flexible material impervious to light, and so made and arranged that the sensitive plate or plates contained in it can be transferred to or removed from the camera when required, the back of the latter being specially constructed to receive the open end of the bag.

The flexible bag, of a size adapted to the sensitive plates which it is to contain, is made of silk or other suitable fabric, coated inside with a lining of indiarubber, gutta-percha, or other smooth substance of the like kind, of sufficient density to completely exclude all light.

The smooth inner surface coming in contact with the surface of the sensitive dry plate does not at all injure the latter. The bag is made of sufficient depth to allow its open upper end (when the plate or plates are in it) to be folded over against its side. This open upper end or mouth is surrounded by a metal frame, to which the edge of the fabric is attached.

The sensitive plates being dropped into the bag in a dark place, the upper end is folded down as described, and is held down by an elastic band passed round near the upper end of the plates, the extreme open end and metal frame hanging loose below the band. In this way all light is entirely excluded, and the plates may be preserved for any length of time without losing their quality.

When the plates are to be used, the bag is connected to the back of the camera, or to the dark slide which fits upon the back of the camera in which the pictures are to be taken. The lower edge of this slide is open, and is provided with a groove or guide, into which the metal frame at the mouth of the bag is inserted, and is then held firmly in its position by means of a sliding or other clamp or catch, the fabric of the bag which fits round the metal frame serving to make a perfectly tight and elastic fitting between the parts. When the bag has been thus arranged, the elastic band already described may be removed, and the sensitive plate or plates raised up into the dark slide above.

Where two sensitive plates are used, they may be supported by a sheet metal plate between them, the ends of this plate being bent over in opposite directions, one to the right and one to the left, so as to hold both sensitive plates firmly in position.

The dark slide may be provided with a novel device for adjusting the position of the dry plate. This consists of a revolving disc recessed into the back of the slide, and having a semicircular groove upon its front face, the depth of this groove gradually diminishing so that its bottom forms an inclined plane, against which the end of a pin works, which is carried by a flat flexible spring covered with velvet. By turning the disc round with the fingers, the pin and with it the spring is forced outward against the back of the sensitised plate, which is thus pressed forward to the desired position.

After exposure the sensitised plate is returned to the bag, the open end of which is again folded down and held by the elastic band, and it can then be safely removed from the dark slide.

When sensitive plates of large size are to be used, it is preferable to make the bag contain one such plate only.

The improved changing bag may be adapted to any existing dark slide, upon which it is only necessary to provide a groove to receive the metal frame at the mouth of the bag in the way described.

In order to be able to use sensitive plates of different sizes in the same dark slide, separate frames of corresponding sizes are provided, either of which can be fitted into the dark slide itself.

Each of these frames is open below, and is provided with a groove or guide to receive the metal frame at the mouth of the flexible bag in the way described.

By this invention considerable saving in weight, space, and cost is effected.

AN IMPROVED MAGNESIUM LIGHT FOR PHOTOGRAPHIC PURPOSES.

No. 7085. JOHANNES GAEDICKE, 74, Ritter-strasse, Berlin, and ADOLF MIETHE Potsdam.—*May 13, 1887.*

OUR invention relates to an improved magnesium light for photographic purposes, and has for its object the removal of those difficulties which have hitherto prevented the general adoption of the same for photographic purposes, notwithstanding that its eminent value as an artificial source of light is generally recognised, in fact, experience proves that for momentary photographs or pictures produced in a fraction of a second it is a valuable substitute for either the electric or day light, but for several reasons these advantages could not be turned to practical account. This may be explained by the fact that it has been the practice hitherto to burn the magnesium in lamps, in the form of thin ribbon or wire, but it was found to be a most difficult matter to determine the proper "exposure." Another difficulty arose in the burning of the wire itself, as neither the method above mentioned of burning the wire in lamps, or of burning the same uncovered, proved suitable for employment in the atelier for several reasons, amongst others, that the latter portion of the wire was not consumed rapidly enough, that the wire was with difficulty ignited, but more especially because the products of combustion were afterwards to be disposed of. The action of the dazzling rays of the magnesium light on the object was, however, a sufficient reason why the same was not employed for photographic purposes. The various improvements invented for the purpose of removing these difficulties have not attained the desired result. According to our invention the magnesium is no longer used in the form of a thin ribbon or wire, but as a fine powder which is mixed in a certain proportion with other bodies, which readily give off oxygen (known to intensify the magnesium light), and also simultaneously mixed or amalgamated with such bodies as accelerate the combustion of the mixture. Such substances or bodies are, for example, chlorate of potash, prussiate of potash, sulphureous and other combustion materials. Whereas prussiate of potash exceedingly accelerates the combustion, the chlorate of potash, on account of its containing a large amount of separable oxygen, performs the very essential function of increasing the temperature to such an extent that the radiating light and the action of the magnesium is greatly intensified. The combustion of the mixture specified in the present specification lasts from about one-thirtieth to one-fiftieth of a

second. It must here be remarked that although the magnesium light, prepared according to our invention, possesses several hundred thousand candle-power, yet it is not possible for the effect of a flash to be so powerfully felt that a reaction of the "model" could take place.

This is explained by the fact that the time the flash takes to find its way from the sensitive nerves to the central organ, and from thence back to the operative nerves is much longer than the limit given above for the burning of the powder, and even if the "model" should move, this movement could only have taken place after the photograph or picture was already taken or completed. Our said improved magnesium powder or mixture is of great value for the purpose in question, because the burning of the same when ignited takes place without any explosion whatever, expanding gases not being objectionably produced. The rapidity of combustion depends considerably upon the fineness of the magnesium powder and other ingredients, and also upon the degree of their mechanical intermixture. The most suitable mixture for this purpose consists of:—Twelve parts of chlorate of potash, six parts of magnesium powder, one part of prussiate of potash; or, twenty-four parts of chlorate of potash, twelve parts of magnesium powder, one part of amorphous phosphorus.

The chlorate of potash is first pulverised in a suitable mortar, and the other substances, namely, the magnesium powder and prussiate of potash, then added. The best results are attained by mixing the substances together upon a smooth sheet of paper by means of a wooden or horn spoon, or by rolling the substances together until a fine grey powder is produced, which serves thus for the magnesium light. The magnesium powder so prepared can be ignited by means of an electric or other spark, and burns with a short flash. By selecting a suitable method of burning the magnesium powder, a light may be produced which can be employed to great advantage for other purposes, besides those of instantaneous photography. Our latest experiments have proved that the introduction of substances or bodies, which show certain coloured lines in the spectrum of the Bunsen burner, make the magnesium light much more effective for these colours. For these reasons we provide the previously described magnesium mixture with an addition of sodium, strontium, lithium, calcium, tallium, barium, and other salts, in order that the magnesium light thereby produced may be made more effective for yellow, red, or green colours. The proportion of these additions of light colouring bodies can be varied from a minimum quantity upwards, to about ten per cent. of the mixture, but it is not advisable to take a larger quantity because they would affect the temperature of the combustion, and also decrease the effect of the light.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim and desire to secure by letters patent is:—1. The employment of a mixture of magnesium powder with oxygen yielding salts, as for instance chlorate nitrate and other salts, as well as with substances that accelerate the combustion such as prussiate of potash, amorphous phosphorus, sulphurous and other combustible materials, pine soot, &c., for instantaneous photography and for producing a momentarily intense light, substantially as described in the foregoing specification. 2. The employment of light colouring substances, or bodies in connection with the herein-described magnesium light in order to make the light more effective for the corresponding colours, substantially as described in the foregoing specification.

[We never like, where it can be avoided, to throw cold water upon a patent; but it is probable that the patentees in this case had never read an article, in our issue of May 24, 1867, entitled, *Photography by a Flash*, from which we here make a brief extract: "Mr. Skaife finds in magnesium powder, when mixed with other pyrotechnic compounds, the means of obtaining a flash of light of the desired intensity and brevity. At the meeting of the South London Society in November, 1865, we ignited a powder composed of magnesium, chlorate of potash, and sulphur, by which we had been able a few evenings previously to obtain a sharp image of a print while it was being slowly moved." This, we imagine, settles the fate of the foregoing patent.—Eds.]

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
August 1	Notts	Institute, Shakespeare-street.
" 2	Coventry and Midland	Coventry Dispensary.
" 2	North London	Myddelton Hall, Upper-st., Islington
" 2	Glossop Dale	Glossop's Rms., Norfolk-sq., Glossop
" 2	Holmfirth	
" 2	Sutton	Society's Rooms, 18, High-street.
" 2	Sheffield	Masonic Hall, Surrey-street.
" 2	Bolton Club	The Studio, Chancery-lane, Bolton.
" 3	North Staffordshire	Mechanics' Institute, Hanley.
" 4	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 4	London and Provincial	Mason's Hall, Basinghall-street.
" 5	Halifax Photographic Society	M. Manley's, Barum Top.
" 5	Yorkshire College	

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Last Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. William England, Vice-President, occupied the chair.

Mr. JACKSON said that the Eastman Company had just been developing about eighty half-plate film negatives taken by Mr. Walker at the Convention at Glasgow.

The CHAIRMAN had seen views of Venice containing little mottled markings, perhaps the grain of the paper.

Mr. E. COCKING had been perplexed by obtaining negatives which were not sharp, although the image on the ground-glass had been perfectly sharp; negatives taken in the middle of the day had this defect, and not those taken in the evening.

Mr. W. M. ASHMAN remarked that heat had a physiological effect upon some persons, causing them to see less perfectly in the middle of a hot day than in the evening.

Mr. AYRES found that blue tinted spectacles were a help in focussing sharply; they made the blacks of the image look blacker.

The CHAIRMAN had had the same experience.

Mr. W. F. DONKIN had had a little experience with American stripping films. If the directions were not closely followed the operator might go entirely wrong. The negatives must not be left too long in water or upon the collodionised glass.

Mr. JACKSON said that they must be left long enough in water, but not too long; glycerine and methylated spirit added to the water facilitated working.

Mr. W. E. DEBENHAM asked if the permanency of prints upon bromide paper was an established fact, for he saw that the Society had issued a statement to that effect upon a print issued with the last number of its *Journal*. He would express no personal opinion as to the permanency of such prints.

Mr. SAMUELS remarked that the *Journal* said that the prints had been presented by Messrs. Morgan & Kidd, and he thought that covered the point.

Mr. DEBENHAM asked if that meant that when any dealer issued a print by any particular process he might also issue with it, apparently under the seal of the Society, any printed statement about it he chose.

Mr. COCKING said that the prints as mounted were not received from Messrs. Morgan & Kidd until the day before the *Journal* was published.

The CHAIRMAN thought that the statement should not have been printed upon the card.

The HON. SECRETARY said that Mr. Debenham was quite right. The issuing of the statement was a slip. In reply to a question whether he would have stopped the issue had he seen the prints beforehand, he said that the inquiry related to the editor's business.

Mr. COCKING exhibited a rack made by Mr. Hinton in which to wash plates. Its construction cannot be explained without the aid of diagrams.

The CHAIRMAN remarked that it would take plates of different sizes, that it was ingenious, and that its principle of construction was new to him.

Mr. Freshwater exhibited some instantaneous views of the Jubilee procession. Mr. COCKING exhibited Newman's shutter.

Mr. ASHMAN spoke of Mr. Van der Weyde's photograph of Miss Mary Anderson at the American Exhibition; it stood out stereoscopically like a statue.

Mr. DONKIN had not seen it, but it was solely due to getting rid of the impression of flatness by viewing through a tunnel. If a good photograph were viewed through a tube with one eye, so as to cut off surrounding objects, the image would appear to stand out solidly.

Mr. ASHMAN thought that photographs nowadays did not stand out so stereoscopically as when the tunnel studies were in use; might it not be well to return to that form of studio?

Mr. DEBENHAM was of the same opinion. Whenever he had not to place the camera very near the sitter he always used a tunnel; it was movable and ran upon wheels.

Mr. SAMUELS had found a camera with a long hood to produce pictures having a more stereoscopic effect than obtainable with his other cameras; no doubt the hood acted as a tunnel, cutting off much useless stray light.

It was announced that at about the end of the autumn an evening would be devoted to the exhibition of reflecting and other stereoscopes and of stereoscopic slides, also that a discussion would take place thereon.

The meeting then broke up.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

On Thursday, July 21, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. H. M. Hastings presided.

Mr. J. B. B. Wellington exhibited views taken in Scotland with Watson's detective camera while it was held under his arm.

Mr. L. Medland exhibited composition photographs printed as election skits.

Mr. A. L. HENDERSON said that Mr. Rockwood, of New York, had called upon him on his way to Paris and told him about an American shutter, one end of which took in the end of the lens inside the camera; at the other end was a slit the full width of the plate, and which fell near the plate, thus giving the exposure; the shutter was somewhat the shape of an egg inside the camera. The late Mr. Collins had given him a shutter made on somewhat the same principle.

Mr. W. E. DEBENHAM remarked that the most satisfactory shutter which he and his brother had ever used consisted of a spring blind near the plate; the blind had a large opening. It operated in one-thirty-fifth of a second, as measured by Mr. A. Haddon.

Some members remarked that Mr. Wirrall and Mr. Edwards had constructed shutters upon that principle.

Mr. J. J. BRIGNSHAW had found Place's shutter to be simple and effective.

Mr. HENDERSON said that Place's was the most light-tight shutter he had ever seen; many of the shutters which work between the lenses did not lap over the lens mounts sufficiently to totally exclude light, so fogging then became merely a question of time.

Mr. MEDLAND spoke well of Newman's shutter.

Mr. HENDERSON had been copying a picture with a portrait lens, and was puzzled, after exposing several plates in succession, to find an effect in each of them as if the centre of the picture only had moved during the exposure. He afterwards found a small opening admitting light out of the field of view of the lens and in the guides for the diaphragm; on stopping this opening the effects disappeared. It was an experiment which could be repeated at any time.

A question in the box asked the best way of evenly coating paper with emulsion.

Mr. W. H. PRESTWICH said that a few weeks ago a good plan devised by an American had been reprinted in one of the English photographic journals: sheets of paper soaking in hot water were removed one by one and laid upon warm glass, then coated with emulsion.

Mr. A. COWAN remarked that the finest coating of emulsion which could be given to small sheets was applied in a rather troublesome way; glass was first coated with the emulsion, paper was then squeegeed down upon it, the whole left to dry, and the coated paper then stripped from the glass. The glass had to be prepared in the first instance, otherwise the emulsion would stick to it and would not strip.

Mr. HENDERSON had heard that Mr. Hubert had received some royal patronage recently; he hoped he would exhibit his work in relation thereto to the Association.

Herr HUBERT remarked that he would do so on a future occasion.

The HON. SECRETARY had seen many detective camera pictures lacking in sharpness; the detective camera photographs he had seen most free from this defect had been taken by Mr. W. England with the camera fixed to his tricycle.

Mr. WELLINGTON remarked that that method of fixing the camera gave an advantage.

Mr. HENDERSON thought that a 1B portrait lens would be good for detective cameras.

Mr. W. N. ASHMAN called attention to a statement in the *Photographic Times* of New York, that slight fog in a negative could be cleared away by a ten per cent. solution of ammonia iron alum, which would also give intensification if the negative were left in long enough. He had tried it, and found that in time the image vanished entirely under the recommended treatment.

Mr. HENDERSON asked if the negative contained traces of hypo.

Mr. ASHMAN had tried one negative before it was fixed and another after it had been fixed and washed; in both instances the picture vanished.

The meeting then broke up.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Committee of this Association met on the 21st instant.

The minutes of the previous meeting having been read and confirmed, Messrs. R. H. Callaghan, A. E. Ewen, F. T. Lupson, H. C. Roberts, J. B. Stokes, J. P. Turnbull, and Miss Godfrey, were elected members of the Association.

Mr. J. J. BRIGNSHAW reported the action taken by him at the Convention re the Association, the result being of a satisfactory character.

Other details of business having been dealt with, the meeting terminated.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A COUNCIL meeting of this Association was held on Thursday, the 14th instant, at the offices of the Association, 12, Old Bond-street.—His Highness the Duke of Teck in the chair.

The minutes of the last meeting having been read and confirmed, the following members were elected:—The Earl of Kilmorey, Dr. Drew, Alfred Mulholland, Esq., Hamilton Emmons, Esq., Colin Boyd, Esq., and F. Gowan, Esq.

The HON. SECRETARY (Mr. Arthur James Melhuish) then laid before the meeting copies of all the pictures contributed for the current year, and Mr. GLAISHER (Vice-President) read his report, in which, after congratulating the meeting on the exceptional excellence of the contribution for the present year, stated that there were in the First Class 138 pictures contributed as follows:—C. Stephens, 7; The Right Hon. the Lord de Ros, 3; R. Murray, 1; W. S. Hobson, 8; Major Board, 3; General Sladen, 3; R. O. Milne, 11; W. Vanner, 9; W. Muller, 9; R. Leventhorpe, 15; George Brook, 9; F. H. Shaw, 3; Colonel Biggs, 4; The Right Hon. the Earl of Rosse, 1; A. Tagliaferro, 4; L. F. Reichling, 5; H. E. White, 7; Miss Mary Egerton, 2; Mrs. Hobson, 14; W. Gaddum, 6; Miss Jane Wilson, 2; Mrs. Coats, 1; J. C. Cohen, 2; C. F. Pritchard, 3; W. Sculthorpe, 1; The Hon. Kingsly Bethell, 2; Baron Liebig, 3; and H. Eumons, 1.

The Second Class contained 109 pictures, the remainder of the pictures being comprised in Classes 3, 4, and 5.

After some discussion as to whether the first prize should be adjudged to Mr. H. E. White or to Mrs. Hobson, it was decided in favour of the former, and the following prizes were awarded:—

To H. E. White, Esq., the first prize, a large silver goblet, for Nos. 159 and 2633. Mrs. Hobson, the second prize, a silver goblet, for Nos. 38, 42, 43, and 45. W. Muller, Esq., a water-colour drawing in frame, for Nos. 1002 and 1007. George Brook, Esq., a silver goblet, for Nos. 5, 7, and 10. R. Leventhorpe, Esq., a silver goblet, for Nos. 141, 147, and 155. W. S. Hobson, Esq., a water-colour drawing in frame, for Nos. 334, 336, and 337. R. O. Milne, Esq., a portrait album elegantly bound, for Nos. 15 and 16. W. Vanner, Esq., a water-colour drawing in frame, for Nos. 90 and 91. Baron Liebig, a portrait album elegantly bound, for No. 3. W. Gaddum, Esq., a landscape album elegantly bound, for Nos. 4 and 7. And to Lord De Ros, a portrait album, for No. 8 and a series of Views at Bath. Certificates of honorable mention were awarded to General Sladen, Major Board, F. H. Shaw, Esq., Colonel Biggs, A. Tagliaferro, Esq., L. F. Reichling, Esq., and C. F. Pritchard, Esq.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual bi-monthly meeting of this Society was held on Tuesday, the 19th instant, at Myddelton Hall, Islington.—Mr. J. Traill Taylor, President, in the chair.

The minutes of the previous meeting having been read and confirmed, the President showed some large silver and platinum prints of groups from negatives taken at the Photographic Convention of the United Kingdom by Mr. John Stuart, of Glasgow, and Mr. Richard Keene, of Derby, at Tarbert and Craig Millar Castle.

Mr. F. W. COX inquired the best method of obtaining a reduced print from a large one.

The PRESIDENT replied that he should make a reduced transparency on glass from the original negative, and then by contact printing obtain the reduced negative.

The President being compelled to leave in consequence of having to attend an important meeting in another part of London, Mr. Cox was voted to the chair.

Mr. William Swan was elected a member of this Society.

The CHAIRMAN thought the members would like to hear from the Hon. Secretary a brief report of the proceedings of the Convention.

Mr. H. M. SMITH said that he and a few others travelled to Scotland by boat, and were well repaid for the extra outlay of time by the opportunities which presented themselves in the river and also on board for instantaneous shots. He then gave an account of the various excursions and evening meetings, and stated that he considered this Convention had been a very great success, being attended by two hundred professional and amateur photographers, representing twenty different Societies in the United Kingdom. He also spoke in terms of the highest praise of the manner in which the members had been treated by their Scotch brethren, especially of the kindness and hospitality of the Edinburgh Society.

Mr. H. Walker showed some prints from negatives taken at Chigwell.

Mr. A. P. HIGGINS showed one of Tylar's metal dark slides, and stated that he found them work well, the only disadvantage being their great weight. He also showed two mahogany half-plate double backs which had been purchased the one for 6s. and the other for 7s. 6d., the latter having a hinged shutter.

The HON. SECRETARY warned members from purchasing cheap photographic materials without exercising the greatest care in examining them before parting with their money. In the case of the two shutters passed round by Mr. Higgins, they must be far from light-tight, and he demonstrated this fact by pushing two thicknesses of note-paper into the slides while closed.

The CHAIRMAN remarked that it would be impossible to exclude light from such shutters unless the greatest care was taken with them. In his opinion, the American form, where the shutter was entirely removed from the slide in making the exposure, was the best.

The HON. SECRETARY, referring to the proceedings of the previous meeting, said that he had been trying one of the "right-about-turn" form of shutters, but could not succeed in obtaining a sufficiently quick exposure with it, and was now using a plain drop shutter accelerated by elastic bands. He had had an opportunity of examining Mr. C. Wollaston's diaphragmatic shutter, and considered it both practically and theoretically perfect, and would endeavour to obtain the loan of one to show at the next meeting.

The CHAIRMAN did not think there was any necessity for very elaborate shutters. Exposures up to one-fiftieth of a second could be made with the plain drop shutter, and in his opinion there was nothing better, and there was no mechanism to get out of order.

A discussion ensued upon the best method of packing plates for travelling.

The CHAIRMAN said he always repacked his plates after being exposed in the same manner as they were originally packed by the maker, and had never had the misfortune to break any.

Mr. READER recommended packing the plates with pieces of white blotting-paper between them.

The HON. SECRETARY said he always packed his plates after exposure in a solid block face to face, and had never broken or damaged any, but in carrying plates as packed by the makers before exposure he had often had the misfortune to find as many as two or three plates broken in one box.

Mr. READER inquired whether any member could give his experience of developing plates away from home.

The CHAIRMAN and Mr. J. HUMPHRIES both thought it a mistake to develop away from home unless it was simply a trial plate.

The following excursion was then arranged:—July 30, to Wanstead Park: train from Liverpool-street (Great Eastern Railway) at thirty-five minutes past two p.m.

The members will also join in an excursion to Dorking with the Photographic Club on Monday, August 1. Train from London Bridge at fifty minutes past ten a.m.

Correspondence.

Correspondents should never write on both sides of the paper.

THE LATE PHOTOGRAPHIC CONVENTION.

To the EDITORS.

GENTLEMEN,—May I venture to ask if we shall have any further reports of the discussions on the papers read at the above Convention at Glasgow? I feel sure from the number of the papers and the representative gathering present an immense amount of useful information must have been given in the various discussions, and I cannot but think it a pity that members who were unavoidably absent, and the photographic world in general, should lose the benefit to be derived from their perusal. Cannot something be done even now to rectify the omission?

While writing, I should like to make some suggestions in reference to future meetings of the Convention. Could not the subscription be increased so as to enable the Executive to publish regular proceedings, the same as is done at other meetings of a similar kind? Judging also from what several friends who attended the Convention told me, I should think it would be advisable to devote separate days to the reading of papers and the outings, as the proper enjoyment of one, if not of both, must suffer when they are taken on the same day. Of course this arrangement was unavoidable at the meeting at Derby last year, when the period fixed was three days, but now the time has been extended to six days, there should be no difficulty in keeping the objects of the Convention distinct, and I certainly think one day, if not more, should be given up to the reading and proper discussion of papers, if only as an act of courtesy to the authors who have devoted time and labour in preparing them.

Expressing my gratification at the way the Derby child has grown in proportions and usefulness, and with every good wish for its future advancement—I am, yours, &c.,
H. M. HASTINGS.

54, Edith-road, West Kensington.

[We do not think that there is any chance of there being further reports of the discussions on the papers read at the Convention. We are entirely at one with Mr. Hastings as to the desirableness of effecting a separation between the excursions and technical proceedings, but Glasgow and its vicinity are so exceedingly rich in everything allied to scenic grandeur that it was difficult to arrange matters otherwise on last occasion. While it is undesirable to increase the subscription, yet do many feel that an annual subscription of five shillings is too low.—EDS.]

THE "EURYSCOPE."

[By request of Messrs. Marion & Co., the agents for Messrs. Voigtländer & Son, we insert the following letter, addressed to them by the eminent firm of opticians.]

"Braunschweig, 18 July, 1887.

"Messrs. MARION & Co., London.

"DEAR SIRS,—We duly received your favour of the 16 July. The advertisement of Perken, Son, & Rayment, you sent us has greatly astonished us. We assure you and state herewith, that we are the first opticians who invented an objective named 'Eurycope,' the construction of which we published already in 1877, as every handbook of photography will confirm. The name 'Eurycope,' too, is at first employed by us; until this day nobody has dared usurp this name, which we consider to be ours. How such a proceeding is to be judged, every honest man knows and is unnecessary to say.

"That furthermore Messrs. Perken, Son, & Rayment put the words 'None genuine unless bearing Trade Mark' in their advertisement of their imitated construction is only intended to deceive the public and to mask the design. In the interest of all the photographers and amateurs we hope that they will not succeed in their manoeuvres.

"We shall be much pleased to hear soon again from you in this matter—and remain, Dear Sir, yours very faithfully,

"VOIGTLÄNDER & SOHN."

STRIPPING FILMS.

To the EDITORS.

GENTLEMEN,—I make a suggestion to my amateur friends who are engaged in solving the practical difficulties of stripping films. Last year I brought before the Birkenhead Photographic Society specimens of transferred albumenised films taken thirty years ago, and as good now as the first day they were completed.

In the days of the wax paper process we placed the sensitive waxed paper in a bath of casine, or what is commonly called whey. We found it increased the sensitiveness of the waxed paper. The idea was adopted by a maker of albumenised paper, who rashly rushed into the market with paper so prepared, and to his horror the film invariably separated from the paper support whilst in the process of fixing with hyposulphate of soda.

I transferred a number of films on to paper and opal, but was obliged to give it up as the maker of the albumenised paper would not continue his mistake. The film when transferred was remarkably tough and stood any amount of handling; when strongly printed the definition was as fine as any transparency on glass. The print left on the paper was of a spongy appearance and useless as a photo.

Could we not persuade the Eastman and other negative paper makers to try the whey experiment before coating their paper with the emulsion? I feel confident it would add to the sensitiveness of the emulsion film, whilst it would render the transference of it to glass or paper more easy and certain.

Any plan that would reduce the opacity of the process as at present carried on is desirable, for undoubtedly not only is the beauty of the negative enhanced, but the charm of portability is perfected.

Birkenhead, July 27, 1887.

JAS. ALEX. FORREST.

"MERIT" AND "MEDALS" AT DERBY EXHIBITION.

To the EDITORS.

GENTLEMEN,—When an exhibition prospectus distinctly holds out to exhibitors that certain awards are to be made, is it the right thing that at the pleasure of the judges they can withhold any of these awards, taken for granted, of course, that there are a sufficient quantity of pictures exhibited? This would seem to be the rule at the Derby Exhibition, and when asked why the promised awards were not made, the answer received is, that the judges did not see sufficient merit in the pictures shown to warrant any further awards being given! Now, I ask, is it not decidedly unsatisfactory, after making a distinct statement with regard to awards, and putting exhibitors to no end of trouble and expense in sending their exhibits, that they have to pass through some unknown merit ordeal? And what I would like to know, through the medium of

your valuable JOURNAL, is, what is this standard of merit through which they have to pass? Are the judges supposed to know all the circumstances under which every individual photograph is taken? Is it the most gorgeous landscape that gains the medal? or the most spacious mansion? or the photograph of a titled lady? or an actress in a blaze of white? or a something big and showy to the eye, with a month's retouching upon the negative, and other aids outside the pale of true photography?

Is it not a fact that gainers of the medals at photographic exhibitions of the present day are, as a rule, those men who can command a range of lenses and apparatus that would make a provincial photographer's teeth water, and have a staff of assistants, through whose hands their pictures pass, that it becomes almost impossible to know to whom the real honour of the medal belongs? Now, I, a provincial photographer without the aid of a large range of lenses, or even a single assistant, have had the daring to send two years in succession to the Derby exhibition, exhibiting both seasons in the architectural class, and have found that the first season, although three awards were promised, none were made, and that this year one medal has been withheld. I am not particularly interested to know how far I may be removed from the medal list, but I am anxious to know why there is still a gap left in prize list, and it is this standard of merit that is bothering me.

Now I would suggest that in future the Committee of Management of this Exhibition should say in their prospectus that any or all of the medals may be withheld provided the pictures do not come up to the standard of merit, and so keep unsuspecting photographers like myself from supposing that the best pictures exhibited at Derby Exhibition would receive the awards and not the best pictures the world can produce which may not be shown at that particular exhibition.—I am, yours, &c.,

Arbroath, July 26, 1887.

J. GEDDES.

CHERRY FABRIC AND RED LIGHT.

To the EDITORS.

GENTLEMEN,—I suppose most photographers who have used cherry fabric know that it loses its colour. The enclosed might be called a good specimen of fading, having become almost white where exposed to light.

I believe many injure their eyes by having red light right down to the level of the developing dish, so that the glare of red strikes directly into the eyes. I find I see better, and with much less discomfort to my eyes, by darkening all the lower portion of my window, so that all the light falls from above the level of the top of my head. I would recommend those who have red or yellow light down to the level of their developing dish to try this.—I am, yours, &c.,

H. G. M. CONTBEARE.

The Hut, Ingatstone.

IRIDESCENT MARKINGS ON PLATES.

To the EDITORS.

GENTLEMEN,—I notice from reports of Societies' meetings that the question, "What can be done to remove the iridescent markings around the edges of plates?" has been often asked lately.

I have carefully tried the prescribed remedies, but found them all fail. The red prussiate of potass and hypo reducer removes them almost instantaneously if applied while the negative is still wet. Of course when using this it is necessary to carry the development a little further than usual to counterbalance the action of the reducer. By this treatment plates otherwise quite useless may be made to give good negatives.

Doubtless you will find many people who know all about it, and have used it for years. I have not seen it in print, and trust it may prove useful to some of your readers.—I am, yours, &c.,

J. P. GIBSON.

Hexham, July 23, 1887.

FINDERS AND FOCUSERS.

To the EDITORS.

GENTLEMEN,—In reply to "Jumelle's" inquiry, I beg to say that at the proper time he and all others will know all about my special claim in connection with the finder and focuser.

Let "Jumelle" moderate his sorrow; he will find that I have not done so silly a thing as he supposes.—I am, yours, &c., S. D. MCKELLEN.

Manchester, July 22, 1887.

Exchange Column.

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

Half-plate rectilinear lens for quarter-plate bellows camera with three double backs, by good maker.—Address, E., 11, Manry-road, London, N.

I will exchange a whole-plate portrait lens for enlarging apparatus with six-inch condensers.—Address, W. W., 156, Noel-street North, Nottingham.

Wanted in exchange, a good portrait lens for pictures not less than ten-inch or good studio furniture. See Sale Columns.—Address, J. PICKER, Runcorn.

Wanted, McKellen's or Shew's combination (Brown's patent) whole-plate camera in exchange for lever watch and cash.—Address, BERNARD GREEN, Cockermouth.

I have a number of carbon enlargements by Vernon Heath (views, &c., 27 x 23); will exchange for outdoor apparatus.—Address, W. SLATER, 232, Albany-road, Camberwell.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

Lady Dalton Fitzgerald, 33, Grosvenor-place, S.W.—*Photograph of Buckingham Palace.*

P. M. Laws & Son, Newcastle-on-Tyne.—*Photograph of the prize bull "Rob Roy."*
G. W. Wilson & Co., Aberdeen.—*Oil painting of Dorothy Vernon.*

C. BANYARD.—Try No. 2.

S. J.—If you find the paper tones better with the borax bath than with the acetate, why not continue to use it?

H. B. H.—1. Under the conditions the occurrence is by no means singular.—2. There is no remedy now unfortunately.

L.E.X.—Lantern pictures may be produced from paper negatives, but care must be taken not to allow the grain of the paper to show.

W. J. (Doncaster).—Hardwich's *Photographic Chemistry*, ninth edition, published by J. & A. Churchill, New Burlington-street.

B. A. WESTON asks us why he cannot dissolve gelatine in methylated spirit.—The answer is very simple. It is because gelatine is not soluble in spirit.

H. G. M. CONYBEARE.—Fruit and vegetable presses or strainers have long been employed in breaking up emulsions. The special one referred to will answer quite well.

X. Y. Z. (Hyde).—For ordinary landscape work the plates mentioned are well adapted. Better sacrifice one or two small ones at first in order to ascertain the most suitable exposure.

J. C. B.—We obtain our asphaltum from a drysalter in Long Acre. It dissolves readily in benzol and other solvents. It can, doubtless, be obtained in solution from artists' colourmen.

BUCKS.—The platinotype process will answer all your requirements, and it is simple to work. If you mask the negatives neatly you can print the pictures with a margin, which enhances the effect.

P. P.—The light of a common paraffine lamp is quite strong enough for printing on bromide paper. You must take the precaution to expose at some distance from the light, or there will be risk of over exposure.

J. W. RANDLE.—We know of no one in this country from whom you are likely to obtain Landy's work on the lantern unless J. J. Atkinson, Manchester-street, Liverpool, who keeps several American productions.

QUIZ.—1. We do not know how the sulpho-pyrogallol referred to is prepared. The manufacturers do not publish the formula by which it is made.—2. Dumfries.—3. There is nothing better than the hyposulphite of soda.

GEORGIUS would be glad to know why he gets scratched lines on some of his prints when burnishing. He does not think the burnisher is at fault, as it is quite new.—If the scratches do not exist on the bar of the burnisher, they are probably caused by grit or dust being on the prints at the time they are burnished.

J. D.—1. The print is not toned.—2. Employ an intense negative and a good toning bath of your own making; do not buy one ready made.—3 and 4. Yes.—5. The lens is right enough; all depends upon the skill of the user.—6. We do not know.—7. Yes, if dry ferrotype plates are employed, but they are usually made by the wet collodion process.

RICHARD W. says he lent some negatives to a friend to try his hand at printing with, and when they were returned many of them were badly scratched. He asks if there is any remedy.—The only plan is to touch out the scratches with water colour. This must be neatly done, otherwise the blemishes will become more conspicuous than if they were left alone.

LOLO.—The soda to employ in the developer is not the bicarbonate, but *washing soda*. The white dry powder with which the crystals get encrusted is better than the crystals themselves. In such cases where bicarbonate is procurable and the monocarbonate or washing soda is not, the former then may be made to answer by placing it in an iron ladle or spoon, or on a shovel, and heating it to an approximate redness.

PERPLEXED wishes to know the methods used for printing the "titles" of views on negatives so as to appear in white letters in the prints.—The plan usually adopted is to write the titles (backwards, of course) on the negatives with an opaque ink or paint; it will then appear white on the print. The writing should be done with a fine sable pencil. Bates's black varnish to which a little lampblack has been added forms a capital ink, as it does not run and dries quickly.

A. WARD says: "I have a few ounces of triple crystallised nitrate of silver which I have had by me since I used to work with collodion, and the crystals look discoloured and different from the fresh nitrate. Is it necessary to recrystallise it before it is used for sensitising paper?"—It is not at all necessary to do anything with the salt; the crystals being slightly discoloured is of no consequence. Crystals of nitrate of silver, if neutral, are very prone to discolour by keeping, particularly if exposed to light.

STEPHEN WILLS writes as follows: "I have been making some prints on gelatino-bromide paper with the glazed surface, and wanted them with a high gloss, like enamelled prints. I squeezed them on to glass, and when I took them off they had all the gloss I desired, but when they were mounted it all disappeared and were nothing the better for being on the glass. What shall I do?"—To retain the highly glazed surface, the mount should be attached to the print while it is yet on the plate and not stripped until it is perfectly dry.

C. W. P. inquires: "What part of the Isle of Wight would you recommend as being the best to visit from a photographic point of view—a place where rural scenes could be secured together with the ordinary seaside views? Reading so much about 'chalk cliffs' and 'downs' has frightened me."—Fine pictures may be secured in, and in the vicinity of, Shanklin Chine, but Ventnor and all along that coast will also permit a few dozen plates to be exposed with advantage. For yachts and boat scenes Cowes is unrivalled; but, in fact, go where you like in that island, innumerable pictures are to be found.

W. ETHELBERT HENRY (Sarina, Ont.).—The firm with whom you have had dealings is a totally different one from that referred to by the Queensland correspondent. We have put ourselves to the trouble of inquiring into the grievance of which you complain; and having been favoured with a perusal of the whole correspondence, including copies of letters sent to you and your friends, have no hesitation in saying that your allegations of inattention and discourtesy have not the slightest foundation in fact, as we have now before us copies of the letters (torn from the letter book) that were sent you. We imagine they may have miscarried in course of post, but the firm named could not possibly have shown more attention than was done.

H. C. M. writes: "I am going to take a trip to the West of Ireland in about a fortnight, taking with me a half-plate camera; in using that camera for taking stereoscopic views on, say, quarter-plates, could you tell me what distance to shift the camera for the second exposure? also if the angle of view embraced by the lens would need to be taken into consideration?"—In reply: The camera must be shifted to such an extent as to exceed slightly in the two positions of the lens the distance apart of the eyes. The greater the separation the more pronounced will be the stereoscopic effect of the pictures, although such will not then be true to nature, but exaggerated. This holds good altogether irrespective of the nature or focus of the lens or the width of angle it includes.

W. writes: "I have a quantity of glass remaining from the days of the collodio-albumen and wet processes, in various sizes from quarter-plate up to 18 x 14, which is now, under the present system of commercial gelatine plates, of no use to me. The bulk of it is in the smaller sizes. I have not offered it to any of the dry plate makers, as I understand they prepare their plates in large sizes and cut down to the required dimensions after coating, and that the smaller sizes would be too much trouble for them to coat single plates. I should be very much obliged if you could inform me how to dispose of it to the best advantage, as at present it is merely useless lumber."—We imagine that hundreds of photographers are in the same position as our correspondent with reference to a stock of useless glass. The only plan we can suggest is to advertise it for sale, though we have doubts if it will meet with a purchaser. We know many photographers who would be glad to give away their old glass if they could meet with any one who would accept it.

MR. GEORGE P. CARTLAND writes: "In reference to your remarks on 'Jubilee negatives and pictures,' I should like to ask you if you think that a picture similar to the one accompanying this letter could have been obtained on a wet plate at eight o'clock in the evening, as this was done?"—The photograph referred to is a scene at Windsor, taken on the occasion of the Queen's arrival. By the ordinary wet collodion process it could not have been done unless with a lens of unusual angular aperture. But Mr. Cartland's lens has been somewhat strained, for while the centre and the nearer right side is sharp, the left, in which the royal carriages are drawn up, is rather out of focus. This doubtless might have been obviated by a more vigorous application of the side-swing. But the picture is a good one notwithstanding.

We hope next week to overtake arrears of notices of exhibits at the Convention and in the Manchester Jubilee Exhibition.

We inadvertently applied the wrong name to the principal figure in the cartoon of which we spoke last week. It should have been Joseph, not "John," Gray.

A PROPOSED trip in the s.s. "Ceylon" to the Baltic, Russian and Scandinavian capitals. Will some one give hints as to the best guide-book useful to a photographer, or any other information?—C. V.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, August 3, 1887, will be on *Colour Photography*. Bank Holiday outing at Dorking: train from Victoria at thirty minutes past ten.

The next meeting of the North London Photographic Society will take place on Tuesday, August 2, when Mr. Octavius Smith will read a paper on *Systems of Numbering Photographic Stops and Lenses*. Visitors are invited.

We learn with regret that the rear portion of the photographic store of Messrs. E. & H. T. Anthony, New York, was destroyed by fire on the night of the 12th instant. The chemical and apparatus factories in the front store were uninjured.

It is now some time since we had an opportunity of making trial of dry plates of American manufacture; but during the past week a sample packet, bearing the "Eagle" brand, has been left with us by Mr. Donelan from New York. We have tried them and find them to be both quick and good—quite as good, in fact, as many plates of English manufacture.

We are always glad to receive specimens of photography executed in distant parts of the world. Mr. A. Farsari, of Yokohama, Japan, favours us in this respect with some of his works illustrating Japanese life and character. Mr. Farsari says he has taken up photography but a short time ago, yet are his works most creditable productions, some of them being skilfully coloured and tinted. They compare very favourably with home productions.

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IRON ALUM AS AN ALLEGED INTENSIFIER.

THE latest claimant for popular support as an intensifying agent comes forward in a somewhat anomalous character, since it is said to clear away slight fog, and, at the same time, add to the density of the negative. But in the brief discussion that took place on the subject at the last meeting of the London and Provincial Photographic Association, Mr. Ashman, who had tried ammonia-iron alum, found that, so far from its possessing any intensifying action, it behaved as a reducing agent, and this is certainly the capacity which, from actual experience, we should ourselves expect it to exhibit.

Some three years ago—in January, 1884—we published in these columns some notes on ferric and potassio-ferric sulphates, in the course of which we detailed our experimental attempts to utilise these two substances as negative reducers. Though our experiments were conducted with the potassium salt, the different iron alums are so similar in constitution, character, and properties, that we have little reason to suppose that the ammonia-iron alum will behave in materially different manner from its congener. The chief difference between the two will be found in the fact that the ammonia compound is slightly more stable than its fellow, a circumstance that may cause some of the phenomena we have to record to be less marked than with the potassium salt.

In describing these curious compounds, we may state first of all that the term "alum" applied to them is, strictly speaking, a misnomer, since they contain no trace of alumina, but receive the name because they are isomeric with the double sulphates of aluminium which pass under the generic title of alums. They are, in fact, double salts in which the sulphate of iron (ferricum) replaces the corresponding salt of aluminium. Thus, when ordinary potash alum without its water of crystallisation is represented by the formula $\text{Al K} (\text{SO}_4)_2$, potash-iron alum has the composition $\text{Fe K} (\text{SO}_4)_2$, and each contains the same proportion of water of crystallisation, namely, twelve equivalents.

The iron alums are made by mixing their component sulphates in equivalent proportions in the presence of a slight excess of sulphuric acid and allowing the double salt to crystallise spontaneously. The crystals have precisely the same form as the true alums and are colourless, or nearly so, commercial samples exhibiting generally a slight pinkish or brown tint. Potash-iron alum especially is peculiarly liable to decomposition, particularly when heated and in its solution, decomposes slowly at normal temperatures and very readily if heated to 180° Fahr., separating into insoluble basic potassio-ferric sulphate which is deposited, normal ferric sulphate and free sulphuric acid. If kept for some time, however, this solution yields, on evaporation, crystals of the original double salt.

Ferric sulphate, more popularly known amongst photographers as persulphate of iron, was first suggested as a reducing agent for negatives by Mr. Warnerke at an early meeting of the Photographic Club, on account of its solvent action upon metallic silver; but we do not recollect to have heard of any such application of it having been made in connection with gelatine plates until our own experiments in 1883 and 1884. If metallic silver be immersed in a cold, strong solution of the persulphate, it is slowly dissolved, and after a time redeposited as a fine metallic powder as the solution becomes gradually decomposed. If the solution be heated the silver is dissolved more rapidly, in fact with considerable energy; but the decomposition of the iron salt also takes place more rapidly, and consequently the reprecipitation of the silver as well mixed, in this case with a considerable quantity of the insoluble yellow basic sulphate. If the solution be acidified with sulphuric acid, however, the silver is thrown down in a state of great purity.

The double salt of potassium and iron, though less liable to change, is still subject to precisely similar decomposition to those mentioned, though they occur more gradually, and it was for this reason that we were led to try the potash-iron alum in the first instance. The ammonia compound being still more stable may, as we have already suggested, possess slight advantages over either, but we do not apprehend that they will be such as to render that salt of any practical value, for the reasons we shall give.

If we proceed to treat a fixed and well-washed gelatine negative with iron alum, we find that the image is rapidly removed by the solvent power of the solution. Removed, that is to say, so far as its original character is concerned, for though the silver is dissolved out, its place is taken by a deposit, more or less strong, of the insoluble basic iron salt already mentioned, which forms a faint, dirty yellow image. But in addition to this action on the image, the clear portions of the film become tinged of a deep yellow colour, the character of the stain varying with the strength of the solution. If the latter be weak, the stain remains transparent, but in proportion as the strength is augmented, so does the tendency to opacity increase, until with a very strong solution the faint image almost ceases to be discernible. If an unfixed negative be so treated the image disappears as completely as if bleached out with chloride of copper.

As the strength of the solution is decreased the solvent action upon the silver forming the image naturally becomes less, but to a greater proportionate degree than the staining power. Consequently, if a negative be immersed for a short time in such a solution, the shadows become stained before the

image is materially reduced in strength, though complete reduction will take place if a sufficient time be allowed.

These facts may possibly supply us with a clue to the claim made by the writer in the *Photographic Times* that ammonio-iron alum will at the same time clear away fog and intensify a negative, though it will depend upon the exact nature of the fog whether or not our theory is applicable. Fog in many, perhaps the majority, of cases consists of a surface deposit, as, for instance, when it is caused by slight access of white light in the developing room or by forced development. If it be chemical fog created in the emulsion it will necessarily exist throughout the whole thickness of the film, and then the theory we propose seems less probable.

Given a solution of the ammonio-ferric sulphate of such a strength as to act slowly upon the metallic image, we can readily conceive that it will exert its influence first upon the surface of the film, and if the fog be purely superficial that may be expected to disappear before the built-up metallic deposit is appreciably affected. Even granting that the fog deposit reaches throughout the whole thickness of the film, we are warranted in believing that it may be totally removed before the more solid portions of the real image are greatly affected; since, as the solution penetrates those parts of the film, its solvent power is exhausted by the surface metal, and by the time it reaches a certain depth into the gelatine it has become totally deprived of all power of acting on the silver. It is, then, only by the gradual exercise of the process of osmose that a sufficient quantity of active solution is brought to bear on the image portions of the film, while where only slight fog exists the solution is absorbed into the film with less drain upon its powers, and consequently may eliminate the fog before the image is materially affected.

With regard to the alleged increase of density we are disposed to think that this is, if not purely imaginary, based upon a fallacy, or rather upon the stain, imparted to the gelatine by the iron solution. We all know how greatly the density of a negative is apparently reduced by treatment with alum and citric or hydrochloric acid in order to remove the pyro stain. Inversely an appearance of greater density will follow the yellow stain given by the iron, but how far the apparent intensification is real can only be estimated by actual trial. Such dodges as printing through a coloured varnish or sheet of tissue-paper which supply a uniform increment of density to lights and shadows alike, are resorted to with advantage with very thin negatives, so, possibly, the application of an even stain to the film itself may have a similar result; but obviously the treatment must be of limited application.

One other explanation of the alleged intensifying action suggests itself as we conclude. Some years ago Mr. R. Kennett published a method of *slightly* increasing the density of a negative and at the same time clearing it, consisting in plunging the plate direct from the fixing bath into a solution of ferrous sulphate. Possibly there is something in Mr. A. L. Henderson's suggestion with regard to the presence of hypo in the film having something to do with the result, so far at least as the intensification is concerned. But in any case we fail to see how the staining difficulty is overcome.

THE OLD SYSTEM OF TONING.

A SHORT time back we directed attention to a series of photographs of scientific celebrities which are to be seen in the Patent Museum at South Kensington. These portraits were produced

long prior to the introduction of the system of toning with alkaline gold bath. Although a large proportion of these prints are, we believe, now upwards of thirty years old, yet many of them show very little, if any, signs of fading. Some, it is true, have become exceeding yellow, but where they have the change in most instances has not been accompanied by any very serious loss of detail. Taking them as a whole we very much question whether a similar number of prints, taken promiscuously out of a lot produced by the alkaline method only one-fourth the time these have been, would present any better, if so good, an appearance.

We have ample evidence that some of the earliest prints which were toned in the compound toning and fixing bath are still as good as when they were first taken out of the washing water, and, what is more, many of them did not receive anything like the care in the washing which is bestowed upon those of the present day, yet they do not appear to have suffered therefrom. It is manifest, therefore, that under some conditions pictures toned and fixed in the same bath may be permanent—that is permanent in the general acceptance of the term. We know also that some prints toned in the modern gold bath, and upon which every care has been bestowed in the fixing and washing operations, have shown unmistakable signs of fading after the lapse of a very brief period. This naturally leads one to ask, in face of these facts, if the present method of toning with alkaline gold is after all really the best, and whether, if the old plan were reverted to, a greater degree of permanence might not be secured?

Most who remember the method of using the compound toning and fixing bath are quite aware that sulphur must have played a very active part in the colouration of the prints, because it is well known by those who used it that the bath was usually employed—and it continued to tone—long after it must have become exhausted of its gold. With this knowledge before them many of the old school have been led to surmise that, with our improved knowledge, were we to go back to the former plan of toning and fixing in one operation the prints would prove more permanent than they do with the present system. It must be admitted that after nearly thirty years of trial the alkaline process of toning is found wanting, so far as stability of the results are concerned, yet, theoretically, it is far preferable to the old plan.

Here is another phase of the question. Suppose we were to go back to the compound bath, should we obtain the same rich tones as of yore? To this we unhesitatingly answer in the negative, unless at the same time we were to revert to the old kind of negative and the former system of heavily salting and strongly sensitising the paper upon which the prints are made.

Since the old toning and fixing bath was discarded photography has undergone a complete revolution as regards the character of negatives and the amount of silver contained in the paper, also in its albuminous coating. Originally the negatives were made exceedingly dense in the lights, while the shadows were kept scrupulously transparent, great density being at that period considered an essential to a good negative. Some of the old negatives took from half a day to a day to print in a moderately good light. The albumen was always highly charged with chloride and moreover was used diluted with water. The paper used to be floated for twice the time now given, whilst the silver bath was about double the strength of that at present employed. Furthermore, the picture was always printed considerably darker than is now customary, as it became reduced very much in the toning. Consequently

when the print was removed from the frame it was strongly bronzed in the shadows and the image was deeply in the body of the paper, sometimes showing strongly on the back.

When a print of this character is immersed in the compound toning and fixing bath the first change of colour is to that of a brick red—similar to the tint assumed when one is placed in the ordinary fixing bath before it is toned. From this brick red the colour gradually changes to brown, then to purple and on to black, and, finally, an inky black. If a print of the opposite character, such as those produced under existing conditions, be immersed in a compound toning and fixing bath, it would take a paler tint to begin with and could not be toned beyond an unsatisfactory yellowish brown colour.

Hence, if we were desirous of again adopting the system of toning and fixing in a single solution we should necessarily have to alter our present conditions of working entirely, because with the present character of negatives, and the lightly salted and correspondingly lightly sensitised paper now in use, it would be quite impossible to obtain the same rich tones as formerly.

HAVING reason to know that the group of the members of the Photographic Convention which we issued last year was greatly appreciated, it gives us pleasure to announce that a companion picture, printed in the same high style of collotypic art, will be given with our issue of next week. The negative from which it is printed was produced specially for us by Mr. John Stuart, of Glasgow; the scene is at Tarbert (Kyles of Bute), the occasion being one of the excursions indulged in by the members. The various likenesses are excellent and immediately recognisable.

PHOTOGRAPHS of lightning flashes, once looked upon as marvellous achievements, are now, comparatively speaking, common; but considerable interest yet attaches to them on account of conflicting theories still held as to the path and progress of the current of electricity from earth to cloud, and *vice versa*.

THE interest taken by photographers in all subjects connected with the production of the electric light "goes without saying." It is well known that some of the best known names in the electric world are equally celebrated in the annals of photography.

SOME of our readers who may be experimenting in the production of the light by batteries may read with advantage some remarks by M. Sambuc, in the *Revue d'Hygiène*, on electricity in the house. He points out the important bearings it has upon hygiene, one of these being the liberation of hydrogen gas where strong batteries are used in which zinc is dissolved by sulphuric acid. Besides the danger of breaking the vessels, this gas, mingling with the surrounding air, may form an explosive mixture. Then, again, from the presence of foreign bodies, the gas may become dangerous in other ways—sulphur, arsenic, and phosphorus being no uncommon accompaniments of hydrogen made from common materials. As an example of this danger, it may be mentioned that a chemist is known to have lost his life through the inhalation of a small quantity of arseniuretted hydrogen.

From the dark room such batteries should be entirely excluded, the danger being very insidious in character. When Bunsen or Grove batteries are employed the fumes are more readily perceived by the olfactory organs, although, to our own knowledge, the precautions that it might be assumed would be, as a matter of course, taken by every one to avoid injury from their presence are not always taken. Our co-operation had been asked in the matter of a scientific *conversazione*, and we brought thereto a number of valuable instruments, some of which contained intricate brasswork, the main part of which was unlacquered. After having arranged our apparatus, in a comparatively small room, our readers can judge of our astonishment when another exhibitor calmly proceeded to fix up a six-cell Bunsen within a foot or two of our valued instrument. Insensible to our

remonstrances that in a closed room full of visitors the fumes would be injurious to them, he was only persuaded to remove his batteries into another room by our threat that we should at once remove our exhibits if they were exposed to such vapours. In a similar manner we may imagine such fumes might be disregarded in the dark room by an enthusiastic experimenter, with results that might possibly result in very grave danger to his health.

A RATHER singular effect of the use of electric light has lately been described by Professor Wiesner, of Vienna. It has been found that a large number of works in the Library of the Technical School had become very yellow, and this gentleman was asked to investigate the cause. He found it to be owing to the powerful rays of the electric beam, which had an action similar to that of the direct solar rays. The particular effect in question was caused only in papers in whose composition ligneous substances, such as wood, straw, jute, &c., entered. He further pointed out that in paper from which the lignine by some chemical means had been removed the yellowing effect did not take place.

THESE remarks have a very important bearing on the question of the so-called "permanency" of photographs, the difference between the fading or alteration of the image itself and the discolouration of the paper base upon which it rests being one not always kept in sight when this question is discussed. Professor Wiesner has explained the phenomenon to be one of oxidation, and evidently to some extent influenced by the amount of moisture present. He points out that solar light acts more energetically than dispersed daylight, which itself exerts but a very slight action, especially in a dry room. Gaslight is nearly harmless by reason of the few re-frangible rays it contains.

THIS latter explanation requires explaining. It is to be understood that the radiations only from the light are under consideration, and their results are to be looked upon quite apart from any question as to the possibility of harm in the products of combustion of gas burnt in the atmosphere of a room without provision for the removal. We unhesitatingly assert that the fading of a large proportion of existing photographs that have faded in the course of years is due to these gaseous products, or to others resembling, but whose presence in the air is to be traced to the combustion of coal. We hold a very strong opinion as to the baneful results upon photographs that these products of gas or coal combustion bring about.

THERE are few photographers who have not, at one time or another, experienced the annoyance of a picture spoiled by some careless hand having made an ink-stain upon the mount. Oxalic acid is usually employed to effect the removal of such an intruder, but we have lately read that a new ink remover has been devised, the inventor of which attaches so much value to it as to have patented the mode of manufacture. The formula runs:—To two quarts of water, which has been previously boiled and cooled, add four ounces of citric acid, and after the acid has dissolved add from six to eight ounces of a saturated solution of borax and twelve ounces of chlorinated lime. Put the whole into a well-stoppered bottle, and shake occasionally in the course of several hours; then allow to settle and decant the clear liquid.

ECHOES FROM THE SOCIETIES.

I COULD not help feeling glad when I read Mr. C. Truscott's article on *Some Photographic Heresies* that I am not a writer on the scientific side of photography, otherwise I must have blushed. I must say, however, that I think he is rather hard upon the class, possibly because he does not know them. "Many of our best photographic writers" are, he says, proverbially "but indifferent photographers." Now, I myself have had the good fortune for many years past to enjoy acquaintance with very "many of our best photographic writers," and my experience of them is that as a rule they are far better "photographers" than the majority of those who call themselves so, and prate about being "practical workers" without being able to string half a dozen lines of English together to help their poor "theoretical" brethren out of difficulties.

"Correct theory is, of course, very useful," as, of course, Mr. Truscott is compelled to acknowledge; but his insinuation or implication that "false theory," or "theory founded on imagination or superficial experiment," forms the bulk of the "very fine writing" of "our best photographic writers," is not only ungenerous and ungrateful, but shows a lack of observation on his own part.

But in his next paragraph we get an inkling of what Mr. Truscott considers or has considered "heresies;" heresies, in fact, from which he appears to have been tardily converted, and in this year of grace and jubilee proceeds to lecture his fellows upon. It seems that when "the journals were half full of the heresy of emulsion photography, . . . nobody but enthusiasts" (of whom he evidently did not reckon himself one) "would read such rot." Ergo, it was "heresy" not to believe what you did not read; but when Bennett showed what could be done, the photographic world, including Mr. Truscott, woke up. Is it fair, though, to blame photographic writers because photographic heretics are too lazy or too unconcerned to read, but prefer to wait until facts are rammed into them by force? Does Mr. Truscott consider it the characteristic of "the intelligent workman" to wait to have information supplied to him in much the same manner as nutriment to a Strasburg goose under the process of fattening?

"Another heresy of mine," he says, is that "development is not the simple matter some people would have us believe." Now this goes further still in fixing the nature of Mr. Truscott's "heresies," for from the very earliest days all "our best photographic writers" have been doing their utmost to instil into the minds of their readers the very same idea, and it is only heretics of Mr. Truscott's class who have gone on flattering themselves that they know all about development, or that it is a purely mechanical operation. That he has not even yet mastered alkaline development, "little science" though it may be, is very clearly proved by his attempt to draw an analogy between it and wet plate development.

Once more Mr. Truscott's remarks on the subject of rapid plates and lenses fall short of the point. The "beginner" who, because he has a rapid lens, must always use it at full aperture, and the steam-power user who must always work his boiler at the full pressure it will bear, are, to my mind at least, about as wise in their generation as the man who buys so-called "instantaneous" plates and persists in making drop shutter exposures when, say, copying oil paintings. I would willingly pay ten dollars a-week more to an intelligent workman than to one of these; yet Mr. Truscott considers it heresy to do otherwise than work at the highest of high pressure!

Seriously, while the Photographic Society of Philadelphia numbers in its ranks many practical photographers, both amateur and professional, including some who are well known writers, and one or two whom I have had the pleasure of meeting personally and whom I know to be above the rank of Mr. Truscott's "heretic," I am surprised that no one took up the cudgels on behalf of the representatives of the scientific side of photography. Practical experience is always valuable, but "rule of thumb" is not worth a dollar a-month anywhere. The scientific writer is generally in possession of, at least, some of the former quality, but he who ventures to run down theory can have little but rule of thumb to fall back upon.

In the discussion on the subject of quick *versus* slow plates the difficulty was mentioned of making short exposures by uncapping and capping the lens when very rapid plates are employed. It is surprising that no exposing shutter for outdoor work has yet been devised which, without being expensive, will give an exposure of a fraction of a second or several seconds at will. I say this with the full knowledge that there are numerous shutters in the market which afford facilities for "graduating" the exposure, some of them to give exposures of definite duration, but these are all complicated and expensive, and even if accurate in their timing do not meet the want.

The shutter I have in view should be on the principle of Cadett's for studio use, which enables an exposure of any length to be given, the lens being opened at the will of the operator, and closed instantly should the sitter move or a gust of wind come. There are many instances in the practice both of portrait and landscape photographers where the operator is desirous of giving as long an exposure as his subject will permit; one second or two seconds will suffice, but he would prefer to give three or four, or perhaps more, if the sitter or the foliage will remain still. In such cases the clockwork shutter,

set to give a definite exposure, is worse than useless; indeed, I never could make out what was the idea that moved the mind of the inventor in devising a shutter that placed the exposure of a plate entirely beyond the control of the operator. Mr. A. Cowan described a shutter some years ago which in principle would fulfil the want I speak of, but I forget the details of its construction. All I remember of it is that one pressure of the pneumatic ball caused it to open, and a second closed it instantaneously. The difficulty of instantly capping the lens when a sitter moves, or when foliage is moved by the wind, is what I should like to obviate.

The new American "Wale" lens, first heard of on this side through the praises of an English photographer, became the subject of discussion at a meeting of the London and Provincial Photographic Association. I question, however, if "Mr. Wale," if there be such a person (it may be the name of a town) will be quite satisfied with the only information that appeared to be forthcoming regarding it, namely, that it was supposed to be "made in Paris and sold in America." Not that it is any the worse for being made in Paris. I daresay a very great many lenses bearing better known names than "Wale" are "made in Paris" and sold and used elsewhere, and, what is more, give every satisfaction.

What is the cause of halation? It seems to me rather a new dictum to set it down to "over exposure," as Mr. Crowe did recently at a meeting of the Liverpool Amateur Photographic Association. Taking the side of glass in a glass *versus* paper discussion, Mr. Crowe enunciated the astounding opinion that the film or nature of the material had nothing to do with halation, and showed in proof of his view some negatives upon glass which were free from the defect. Now the fact that one of these was the representation of a "glass roof with iron supports," proves nothing, unless that Mr. Crowe is unconsciously misleading himself. Nothing is easier than to reproduce such a subject without halation and without backing the plate if a proper exposure be given; but the difficulty is to give the proper exposure to the glass roof and well lighted parts as well as to the darker portion of the picture. Either under or over exposure will do the mischief as well as improper development, to say nothing of reflection from the back of the plate and lateral dispersion of the light in the film itself with many other proven causes. To say, therefore, that halation is caused by over exposure savours of the ridiculous. All the same I am not one of those who believe that paper does away with halation, because there are many causes, one only of which is overcome by the use of the paper support.

Then Mr. Crowe's argument that the same amount of minute detail cannot be obtained in a paper negative as in a glass one, because he "did not believe" that some specimens he showed could "be matched on paper," requires more force to carry conviction to other minds.

It is curious to note that the alleged greater rapidity of paper over glass crops up again, but if, as I take it, the experience of the members of the Liverpool Association is derived from commercial papers, I wonder how they arrive at their comparison without trying the same emulsion spread upon glass. Mr. W. Brooks stated some time ago that *the same* collodion emulsion spread upon paper was several times more rapid than on glass, and *there* was something definite to go upon. If the greater rapidity be real I would suggest as one cause that the developer acts, in the case of paper, simultaneously upon both sides of the film, and so, for reasons I could give more fully, produces a better result.

MONITOR.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

THE EXHIBITION DEPARTMENT.

WHILE George Mason & Co. were much the largest exhibitors of apparatus in the Convention Exhibition, yet were there some others who also made a good display. Passing over for the moment the apparatus sent from elsewhere, McGhie & Bolton, of Glasgow, showed a good collection of the goods either manufactured by themselves or sold by them. We availed ourselves of an invitation to see their place in West Nile-street, where, as an adjunct to studio life, we saw various systems of electric and pneumatic bells. An apartment in the

rear was fitted as a studio in which to try plates or apparatus, and immediately adjoining was a dark room. In this establishment we saw *replicas* of the Convention exhibits and in greater quantity, including cameras of various designs for studio and field, and a small one entitled "The Tourist's Companion;" roller and other dark slides; lenses by leading and other makers; shutters, dark-room lamps, backgrounds, accessories, and the numerous indescribable things which go towards making up the sundries which must be kept by the modern photographic stock house. A conspicuous object among their Convention exhibits was a dark-room developing sink on the model of that for which the Photographic Society of Great Britain awarded a medal last year to George Houghton & Son.

Among those manufactures which are peculiarly of Glasgow origin is the emulsion separating machine. Two of these were exhibited by Watson, Laidlaw, & Co., one of them being of small and compact dimensions, well adapted for the requirements of the amateur or emulsion maker on a small scale.

The Albion Albumenising Company, of Glasgow, contributed washing troughs, portable and studio cameras, and an ingenious camera stand with a compensating balance arrangement.

The means of printing automatically by the agency of his patented apparatus was shown by Mr. John Urie, Glasgow, who exhibited both the machine itself and numerous portraits which had been produced by it. It is the same apparatus by which the illustrations were produced for our ALMANAC for the current year.

THE MANCHESTER EXHIBITION.

IV.

THE members of the Manchester Club make a fine display at the Jubilee Exhibition. It is impossible to give anything like a complete account of these exhibits, but we can mention with commendation *Views of Haddon Hall*, by J. G. Jones; *An Old Mill in Thorpe*, by T. Sefton; *Near Oversley*, by James Ford; *Melrose Abbey*, interior and exterior, by J. T. Foster; *Miller's Dale*, and other places, by E. Openshaw.

While good in other respects, some prints from collodio-albumen negatives by John W. Leigh would have gained in brightness had they not been cemented to the covering glass.

In *Rudston Church*, by T. W. Steventon, the clouds are rather too pronounced, the tendency in such a case, as in too great a wealth of accessories in a portrait, being to distract the attention from the principal feature of the scene.

Hung too high for easy inspection are a series of five photographs by A. Brewer, whose other exhibits are more fortunately situated in this respect. A darker background would have improved his *Organ Grinder*.

A mixed lot of eight views by J. Witham, including *Sands, Ramsey*, contain good, rapid, clean work.

The Manchester Photographic Society is represented in great force, but we shall devote a special chapter to them.

CONTINENTAL PHOTOGRAPHY.

[Translations and Abridgments.]

MISCELLANEOUS ITEMS.

THE death of M. Piquée, of Troyes, is announced; he was a writer upon the connection between painting and photography. The Photographic Society of France has sent an address of condolence to his widow.

The new little Society of Amateur Photographic Excursionists is now in active operation at Paris; its excursion to the Argenteuil quarries has already been described in these pages; since then it has visited the woods of Saint Cloud, to make a special study of the photographing of sylvan scenery.

The Central Union of Decorative Arts will open an exhibition in the Palace of Industry, Champs Elysées, Paris, on August 1 next; it will remain open until November 25. A section of it is reserved for photography and industries connected therewith. The conditions under which objects may be placed on view have been printed, and are obtainable upon application.

Recently we published how M. Haack removed the stain from negatives which had yellowed after intensification with bichloride of mercury, by treating them with sulphide of ammonium. M. Davanne had previously published a better plan, namely, their treatment with sulphide of sodium, the evil smell of which is fainter. In any case the treatment should be effected in the open air.

A volume of specimens of the work of the *Stabilimento Artistico per le Applicazioni della Fotografia*, of Milan, has been published, and a copy presented to the French Photographic Society by M. Vittorio Turati. Portraits of Niépce de St. Victor and Poitevin have been presented to the same Society by M. Nadar.

The French Photographic Society will inaugurate a photographic exhibition in Paris next spring; it will be open but for two days. Similarly brief exhibitions have had great success in connection with other scientific subjects in Paris.

A memoir, not explicable in detail without the aid of diagrams, has been read before the French Photographic Society by M. A. Blazy, describing a remarkable way of exposing paper or other films in the camera. The films are cut to standard sizes, and stored in a kind of book; they can be exposed one by one, and after exposure are caught by a band at the bottom of the camera and rolled up therein by turning a handle. This seems to be a decided novelty in the way of invention.

The subject of photosculpture has been revived in France, and a paper about it has been read by M. Lazard before the French Photographic Society.

A paper by Mr. Herbert Starnes on the direct printing of transparencies, has been translated and published in the *Bulletin* of the Belgian Photographic Association, also in Liesegang's German periodical, the *Lanterna Magica*, also in the *Bulletin* of the Photographic Society of France.

Messrs. Gædicke and Miethe have published in Berlin a method of burning magnesium instantaneously, or rather in times varying from one-thirtieth to one-fiftieth of a second, and of preventing the escape of smoke. They mix chlorate of potash and sulphide of antimony with the magnesium, and ignite them when used. Of course it would be dangerous to life to attempt to grind the above substances together; they must be ground separately first and mixed afterwards. The British Government will not legalise the manufacture in this country of any explosive containing chlorate of potash.

The Amateur Photographic Club of Vienna has begun to issue a journal called *Photographische Rundschau*, or *Photographic Review*.

The *Revue Photographique* of Paris, edited by M. E. Letellier, says that Vogel and Obernetter succeeded in preparing orthochromatic plates, which at midday in the middle of winter gave them instantaneous views, when ordinary gelatine plates would give only silhouettes.

Mr. Birtles's method of intensifying gelatine negatives has been published in the *Photographische Rundschau* of Vienna, and in *L'Amateur Photographe* of Paris.

The *Revue Photographique* says that the method of drying a negative has much influence upon the intensity of the image. A negative dried near a fire is more vigorous than if it had been dried at an ordinary temperature. A negative may be intensified by being wetted and then dried quickly; several times in succession.

The *Revue Photographique* says that it is an old point of discussion whether daylight is less actinic when the wind is in the east.

INTENSIFYING NEGATIVES.

M. G. Cassebaum says that negatives can be evenly and vigorously intensified in the following way. First steep the plate in a faintly acid solution, then soak it in the following bath:—

Nitric acid	1 part.
Water	960 parts.
Chromic alum	48 "

Rinse the plate well, then treat it in the following way. Prepare

A.	
Gallic acid	120 parts.
Alcohol	480 "

B.	
Nitrate of silver	30 parts.
Water	480 "

Mix 30 parts of each of the above solutions, then add thereto 480 parts of water; cover the plate with the solution and leave it therein until the required density is obtained. Then wash.—*Bulletin de la Société Française de Photographie*.

EARLY PHOTOGRAPHS.

After the recent death of M. Bayard, one of the founders of photography, and General Secretary to the French Photographic Society,

his widow offered the Society any of Bayard's relics of early photographic art which it thought proper to accept. M. Davanne, accompanied by M. Dupuis, accordingly went to Nemours to make the selection, which included a series of prints produced in the month of May, 1839, four months before Daguerre made his processes known, and which were then exhibited in aid of the sufferers from the earthquake at Martinique; the prints were mentioned at the time in the official journal *Le Moniteur Universel*. The prints have not deteriorated much, although at the time no means were known of assuring their stability. They also selected some very large Daguerreotypes, and some gold prints on paper, presented to Bayard by the Duc de Luynes. These relics will be religiously preserved in the archives of the French Society which feels grateful to Madame Bayard for her valuable gifts.

WAXING PRINTS.

Dr. Eder gives a brilliant surface to prints upon albumenised paper by treating them with:—

White wax	100 parts.
Dammar varnish	4 "
Rectified essence of turpentine	100 "

To preserve the solution it is put into a well-dried bottle, and when it thickens by evaporation a little more rectified turpentine is added. —*Revue Photographique de la Société Française des Archives Photographiques, Historiques et Monumentales.*

REMOVING SILVER SPOTS FROM NEGATIVES.

The negative is soaked for five minutes in pure water, then in—

Iodide of potassium	1 part.
Distilled water	24 parts.

It is left in the above bath for about ten minutes. When the spots are old ones the plate may be left in the bath for half an hour. It is next placed in a bath of—

Cyanide of potassium	1 part.
Distilled water	16 parts.

It is then carefully rubbed with a little cotton wool until the place formerly occupied by the spot is uniform in appearance with the rest of the picture. When the spots are very old indeed, the solutions may be stronger, and the plate left in them for a longer time.—*Photographische Rundschau.*

PROOF NEGATIVES FOR PHOTO-LITHOGRAPHY.

The negative proof is intensified in the ordinary way by pyrogallol and nitrate of silver, then fixed and washed.

After washing it is placed alternately in a bath of bichromate of potash and permanganate of potash, until it takes on a strong yellow colouration; it is then washed and dried.

Ordinary negative varnish is then applied to it, but coloured with an alcoholic solution of aniline blue.

Consequently, the ground of the negative, under the influence of the light passing through it, takes a deep black colour, and the lines become blue.

A proof negative, so prepared, gives with certainty corresponding results in printing.—*Photographisches Archiv.*

ON PHOTOBROMIDE AND PHOTOIODIDE OF SILVER.

PHOTOBROMIDE OF SILVER.

This substance is formed for the most part by the same reactions as the corresponding chlorine salt. It is not, however, to be supposed that all reddish brown substances resulting from the action of reducing agents on silver bromide are the photosalt. By reduction Ag Br may yield a brownish coloured form of silver, which, mixed with unreduced Ag Br, may form a substance resembling the photosalt, but having none of its properties. The two are easily distinguished by the action of cold nitric acid, which, added to a brown mixture of Ag Br and Ag, quickly dissolves the silver, leaving Ag Br. On the photosalt it has no action.

A beautiful variety of photobromide is easily obtained by dissolving silver nitrate in ammonia and adding it to ferrous sulphate previously mixed with a solution of soda. Then K Br is added dissolved in dilute sulphuric acid, until the mixture has a strong acid reaction. Sometimes this method gives immediately a fine purple, sometimes a brown product. But in either case, after washing and cautiously heating with dilute nitric acid, a beautiful purple results. Much care is needed in the nitric acid treatment, or particles of yellow bromide will form. A specimen obtained in this way gave figures indicating 7.25 per cent. of subbromide. Each specimen, however, varies in composition, often very materially.

I subsequently found it desirable in some degree to vary the method, and to determine the best proportions in which the materials were used, to obtain a constant product. That which I prefer to use is as follows:—Six grammes of silver nitrate are to be dissolved in 200 centimetres cube of water and ammonia added until the precipitated oxide redissolves easily.

Twelve grammes of ferrous sulphate are dissolved in 200 c.c. of water, and the silver solution is poured into this. Then four grammes pure caustic soda dissolved in 50 c.c. of water are added, let stand a few minutes, then five grammes of K Br dissolved in a little water. Finally, dilute sulphuric acid until the whole has a strong acid reaction. This product, well washed, and then heated cautiously with nitric acid 1.36, diluted with five times its bulk of water, gives photobromide of a shade of royal purple, extremely beautiful. Notwithstanding its fine colour it proved to contain but little subbromide, not quite one per cent. (0.98 p. c.).

Various other methods may be employed. Silver bromide may be dissolved in ammonia, and be treated first with ferrous sulphate and then with dilute sulphuric acid. This method, which is very good with the chloride, is less available for the bromide because of the less solubility of the normal bromide in ammonia, so that, although the product is good, it is small in quantity.

Very good results are obtained by dissolving silver phosphate, nitrate, and probably almost any other salt of silver in ammonia, adding ferrous sulphate, and, after two or three minutes, hydrobromic acid.

Potash bromide and cupric sulphate may be made to act on metallic silver in fine powder, but the product is contaminated with much copper, difficult to get rid of.

When Ag Br is treated with sodium hypophosphite a brown or brownish purple form of photobromide is obtained, which seems to be more easily decomposed by nitric acid than most other forms of this substance.

Potash or soda, with oxidable organic substances, made to react on silver nitrate, and then treated with H Br, gives the photobromide. With soda and milk, sugar, or aldehyde, a rose-coloured or pink product is generally obtained.

Reactions.—In strong solution of potassic iodide it dissolves, and this solution by dilution lets fall pale yellow normal bromide. With a weaker solution it becomes somewhat lighter in colour. With acid ferric sulphate there is no action in the cold, but with a few minutes' boiling the photobromide is converted into bright coloured normal bromide. In sodium hyposulphite it dissolves, leaving a little black residue of silver. With ammonia the action at first seems slower than is the case of the corresponding chloride, and if the ammonia is poured over the photobromide in small quantity it may seem to be without effect. But the photobromide, shaken well up in a test-tube with a large excess of ammonia, is almost instantly blackened. Exposed to light, the red shades of photobromide darken with great rapidity. Placed alongside of the corresponding chloride the contrast is very striking; a strong image forms on the bromide long before anything appears on the chloride; nevertheless, if these two films are thrown into a developing solution, the chloride, on which nothing could be seen, gives a vigorous positive development, while the bromide, which already showed a strong positive image, develops a negative one. The details of this reverse development have been already considered in another paper.

As respects the direct effect of light, unaided by development, the contrast between its action on the normal haloids and on the photosalts is very striking. If a rose-coloured photobromide and some normal bromide are exposed side by side the normal bromide (formed in presence of excess of alkaline bromide) darkens but very slowly, while the photobromide is quickly acted on. I have seen deep purple photobromide change to brown all over its surface with less than five minutes' exposure to diffuse light in the middle of a room, an amount of exposure which would scarcely have produced a visible effect on normal bromide formed in presence of excess of K Br.

When photobromide is exposed to the spectrum, it shows the same difference in sensitiveness and darkens more rapidly than photochloride. But it gives little indication of colour. When exposed under coloured glass, photobromide gave distinct indications of reproducing colours, but much less favourably than photochloride. Under green glass it became bluish, under blue greenish, under yellow glass it bleached, and under red glass the red of the photobromide remained unchanged.

PHOTOIODIDE OF SILVER.

The most characteristic colour of this substance seems to be a fine rich purple. It is obtained in much the same way as the corresponding chloride and bromide, with this limitation, that an excess of alkaline haloid must not be present, as the photoiodide is quickly destroyed by it. The iodine salt differs much more from the bromide than does the bromide from the chloride, and two striking distinctions are, its easy decomposition by its own alkaline salt, and its action with ammonia, as will appear beyond.

A very easy and satisfactory method of obtaining the photoiodide is the following: Silver is to be reduced from the nitrate or chloride, in fine powder in any convenient way; I have usually employed Levoll's method. To a solution of potash, iodine is to be added until the liquid becomes almost black. This iodine solution is to be diluted and poured over the silver by degrees, keeping the silver constantly agitated, until the whole mass becomes clear, bright purple. Any excess of silver present may be removed by boiling with dilute nitric acid, but this operation requires far more circumspection than in the case of the corresponding chlorine and bromine products. The acid (1.36 was used) must be diluted with twelve or fifteen times its bulk of water, and the boiling must be very short, otherwise the photoiodide is converted into normal yellow iodide.

Another method by which it may be obtained is to add ammonia to

silver nitrate in considerable excess and to pour this into solution of ferrous sulphate. Potassic iodide is dissolved in very dilute sulphuric acid and added till the mixture has a sharp acid reaction. It is necessary to observe that the K I added must be somewhat short of a proportion equivalent to that of the silver. Any excess of silver may be removed in the manner already explained. Different specimens of the purple product in this way obtained gave various amounts of Ag₂I from 0.64 per cent. to 4.63. The same remark made as to the meaning of these determinations in reference to the other haloids applies to this.

The method of roasting silver oxide until it is black, and acting on it with the hydrogen acid of the halogen, which works well in the case of the chloride, does not answer well for the iodide.

When silver iodide is boiled with solution of sodium hypophosphite, it gives a brown product, evidently indicating that reduction to some extent has taken place; the hypophosphite solution may or may not show traces of iodine. The colour of the silver iodide may show a very marked darkening, and yet the solution may give no trace of iodine by the most delicate reagents. This was very difficult to explain until I found that silver iodide has the property of taking up and retaining small portions of iodine, a reaction not very surprising in view of the tendency I have found in silver haloids to take up foreign substances of very various natures, and also of the facility with which iodine is taken up by alkaline iodides. This property in silver iodide was verified by shaking up portions of freshly precipitated and still moist Ag I with iodine solutions. Alcoholic solution of iodine diluted until it has a pale sherry wine colour is quickly decolourised by Ag I, and the same thing happens with a very dilute solution of iodine in KI, which in a few minutes becomes as colourless as water. This reaction I found particularly interesting, for it not only explained the action of hypophosphite in the case just mentioned, but also gave a clue to the cause of a phenomenon I observed more than twenty years ago, and which then and long afterwards seemed to me an unanswerable argument in favour of the physical nature of the latent image.

At the time referred to, I formed films of pure silver iodide entirely isolated from foreign matter, by reducing metallic silver on plates of ground-glass, iodising them with alcoholic solution of iodine, or with Lugol's solution, then washing most thoroughly under a tap for hours. When these films of silver iodide were exposed to light, they received an invisible image which could be developed. But these invisible images, if the plates were laid aside in the dark, had the property of fading out in a few days or weeks, then could no longer be developed, but the film could receive a fresh image. This seemed an unanswerable proof of the physical nature of the latent image at least on silver iodide. The argument was: If the production of this latent image is the result of chemical action involving the loss of iodine by the silver salt, how then is this iodine recovered when the image fades out? If it is formed of subiodide, where does this latter substance get back its iodine to return to the normal form, as it unquestionably does?

No answer could be given then or after, and this experiment, repeated and confirmed by others, has always seemed the strongest support of the physical theory. When, however, it appears that silver iodide can take up iodine and hold it, the course matters follow becomes evident. By the action of light a very small quantity of subiodide is formed, and combines with the normal to form photoiodide. The iodine set free evidently does not pass off, but remains combined with neighbouring molecules of Ag I, and in the dark gradually recombines with the photoiodide, reconverts it to normal Ag I. In this retention the lower tension of iodine, as compared with bromine and chlorine, no doubt plays its part.

In thus explaining away the fading out of the latent image on silver iodide, the last argument in favour of the physical theory is destroyed, while the chain of proof supporting this new explanation, that the latent image consists of normal haloid combined with its own subsalt, remains unbroken.

Reactions.—When ammonia is poured over purple photoiodide of silver the colour quickly passes to a salmon and then, even after some days, seems to undergo no further change. Of separation of metallic silver, as in the case of the corresponding chloride and bromide, there is no trace. In sodium hyposulphite it dissolves slowly, leaving a slight but distinct residue. Dilute nitric acid mixed with dilute solution of K I slowly but completely converts it to normal silver iodide. Light acts slowly upon it, changing the colour to greenish grey.

I have already spoken of the remarkable manner in which light acts reversely by development on photobromide. On photoiodide the effect is usually the same as on photochloride, namely, the action is direct; but occasionally it reverses, and the exposed part comes out lighter in development than the part that has not been exposed. In this respect the behaviour of the iodine compound is intermediate between that of the chlorine and the bromine.

NOTE IN CONCLUSION.

The investigations of which the preceding pages are the result are still unfinished. I have very lately observed the formation of another group of silver haloids quite different from the photosalts. The members of this new group are deeply coloured, purple or red, not unlike the photosalts, but are sharply distinguished from them by very different reactions. The photosalts are unaffected by cold, strong nitric acid; these new salts are by very dilute acid instantly converted into a pale pink substance

which appears to be a photosalt. But the most striking difference is in the action of ferric chloride. A strong solution of this substance shows no action with the photosalts unless left in contact for many hours or days. But these new haloids are instantly converted by it into what is apparently light pink photosalt. So energetic is this action that a solution of ferric chloride, containing one part only to a thousand of water, quickly attacks these dark purple salts and decolourises them. Such a solution might remain indefinitely in contact with the substances I have called photosalts without affecting them. Other differences exist. So far as I have yet been able to observe, these new haloids are formed pure, whereas the photosalts are almost always contaminated with either free silver or free subsalt, or both. As yet there has been no time to fix with exactness their mode of formation or their properties, which I hope to do at a future day.

M. CAREY LEA.

—*The American Journal of Science.*

PRINTING IN CARBON, AND OIL COLOURS, AND PHOTO-LITHOGRAPHY.*

Mr. Pouncy's efforts were next directed to the perfecting of his process for obtaining lithographic prints from nature, having all the detail and half tone of silver prints; towards this end he attained a considerable degree of success, taking into account the difficulties to be overcome. But the opinion will probably gain ground that neither he nor any other man will ever produce perfect prints from nature by means of photo-lithography, and that no advance is to be looked for beyond the point Mr. Pouncy has reached, unless an entirely new method of dealing with the stone is discovered. There are mechanical difficulties in the way which are practically insurmountable.

Subjects in black and white can be readily produced. I have here a photo-lithograph taken at haphazard from a number of a journal devoted to architecture. To produce this a photographic print was evidently taken in reduced size from the original large drawing, for the fineness of the work is such that it could not be drawn to the size and reproduced at the price; there is little more to be desired in the reproduction of line drawings than is shown here. The printing of pictures from nature is altogether a different matter. In a lithograph the appearance of half tone is produced by lines or by dots, closer or farther apart, thicker or thinner, but every line and every dot is of the same degree of blackness; this constitutes the difficulty. If the stone takes the ink at all it takes it as a dead black; if half tone is desired in the photo-lithograph from nature it must be represented as in the lithograph, by dots. To produce these a grain must be given to the stone finer or coarser according to the subject, or the effect of grain can be produced by printing through muslin or other material which will give it. Artistic prints from nature of architectural subjects with a considerable degree of half tone can be produced in this way, as you will see from this photo-lithograph of Tintern Abbey; but for landscapes with aerial effects in perspective the process is not so satisfactory, the tints are so broken up and print so irregularly, especially for the distance, that nothing approaching the appearance of the original photograph can be obtained, at least in small sizes.

I will hand you some photo-lithographs in illustration, and will go on to the latest and greatest discovery of Mr. Pouncy. The process I am going to speak of is a secret one, and you will not therefore expect me to say much as to the working of it. The secret is known only to the inventor and to myself; how I became possessed of it I will relate presently.

Soon after Mr. Pouncy had invented the carbon process, a means suggested itself to him of producing photographs in oil and mineral colours direct upon any material, without the intervention of any organic matter to unite the oil colour to its support; such prints he thought would be more durable than those in which gum and gelatine were used, as in all carbon and similar processes. Gelatine is an animal substance, and as such is subject to decay, and as it is an acknowledged law in mechanics that a chain is only so strong as its weakest link, so it is equally true that a print is only as durable as its weakest element. If an image is partially formed of, or is united to its support by, gelatine, it seems only reasonable to suppose that when the gelatine decays the image, though formed of a permanent colour, having lost the link which united it to the paper, must suffer.

Mr. Pouncy had also the hope that he might succeed by means of this process in obtaining prints in lithographic ink for transfer to stone, having all the half tone and other characteristics of an ordinary photograph, and, succeeding in placing such a photograph on stone, some means might be devised of obtaining impressions equal to it. He has succeeded in placing upon the stone photographs in lithographic ink of the highest class of artistic excellence, but he has not succeeded in obtaining lithographs equal to them for the reasons stated before. Mr. Pouncy was working hard at his new process in 1860, and before 1864 he had brought it to some degree of perfection.

I have a few words to say here on what may be termed the Duc de Luynes episode. In 1856 the Duc de Luynes offered a prize of 8000 francs, open to all the world, to be given to the artist who should in three years discover a process by which photographs could be produced having

* Concluded from page 475.

all the characteristics of a photograph combined with the permanence of a printed engraving; 2000 francs were to be given to the competitor who in two years made the most important advances in "working off." A Commission was appointed to examine the exhibits and to award the prize. Mr. Pouncy sent in prints for the competition, and a silver medal and 400 francs was awarded him by the Committee, who postponed their final decision to 1864. And now comes the curious part of the story. Before the end of 1864 Mr. Pouncy had discovered the means of producing prints in oil colour; he sent specimens to the Commission as a candidate for the prize, and offered to attend in person and produce prints in their presence so as to satisfy them that the process fulfilled all the conditions required; this they refused, and as there was no other candidate who approached the standard, the prize was still unawarded in 1864, and remained so till 1867. In the February of that year Mr. Pouncy read a paper before the Inventors' Institute, Trafalgar-square, London, *On Sun Painting in Oil Colour*. THE BRITISH JOURNAL OF PHOTOGRAPHY, in commenting on this paper, stated that it was "illustrated by some of the finest specimens of photography without salts of silver that had ever been submitted to public inspection." The *Times* also contains a very favourable notice, and both these papers are circulated in France. Mr. Pouncy also gave notice that his specimens would be in the Paris Exhibition the following month. This appears to have stimulated the Prize Commission to come to a decision, and they in the following month, before Mr. Pouncy's specimens could reach Paris, awarded the prize to M. Poitevin. What had M. Poitevin done to deserve this distinction? He took out a patent as early as 1856 for printing in pigments, but, as the Editor of the *Photographic Notes* stated, "His patent is so indefinite that one is inclined to believe that he patented an idea rather than a process which he had already tried and found to answer." This is borne out by the fact that M. Poitevin did not exhibit a carbon print or a photo-lithograph before Mr. Pouncy published his process, though there was the strongest inducement to any one to do so—particularly to a Frenchman—in the offer of the Duc de Luynes' prize. It was Mr. Pouncy, and not M. Poitevin, who received the medal and 400 francs. Why was not the prize awarded to M. Poitevin in 1859? Why did he not receive it in 1864? Why was the prize unawarded in February, 1867, and given to M. Poitevin in the following month, when the highest praise was being given by the most influential journals to the specimens which Mr. Pouncy announced he would exhibit in that month in the Paris Exhibition? What more had M. Poitevin done in 1867 than in 1864? what new discoveries had he made in the interval? The answer is that he had made no new discoveries, but he was a Frenchman, and it is impossible to resist the conviction that had Mr. Pouncy been a Frenchman, the prize would have been awarded long before. When Mr. Pouncy first exhibited carbon prints and photo-lithographs he was without a rival, his prints were everywhere alone, for there was no one else who could produce them.

The stereograph I hold in my hand is marked on the back, "Pouncy's process, first attempt, Saturday, February 14, 1863." I was in those days admitted freely to Mr. Pouncy's studio, and the idea occurred to me that I would find out his process and surprise him with a print by it. It was more as a mental exercise and as a joke than for curiosity. I was not allowed to see any of the operations though I was allowed to visit his laboratory. I had studied chemistry a little. I could therefore at once divide all the chemicals in his possession into two classes—those which might, and those which could not, produce the results. This left me with very few chemicals; but the question was how to use them. To witness one operation would give me the secret of all the others, and one day Mr. Pouncy invited me to witness one operation. After a few days of hard work in experimenting, this print was the result, and it *did* surprise him.

I found it the other day; it had been lying covered with dust in a drawer for twelve years, and had previously been lying about with rubbish in an outhouse. It was covered so thickly with dust and dirt that the subject could not be seen until it had been washed. You will observe that though it is not so beautiful or so perfect a photograph as Mr. Pouncy's, for it is a first attempt, it has pure white and half tones, and there is no fading anywhere. This is the only photograph I have produced by Pouncy's process, but the knowledge of the working of it has given me confidence in speaking of it, and has enabled me to estimate and appreciate its great value.

I have in this frame specimens of prints on paper and canvas photographed in oil colour; they were sent in October, 1868, to Mr. G. Dawson, the late talented Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, and at that time a lecturer at King's College, London, who undertook to test the prints and report upon them. You will observe he has entered upon each particular of the tests he applied, and he has signed each entry. Hitherto very severe tests had been applied and had failed to injure the prints. Mr. Dawson applied tests of a different kind. Here, for instance, mounted so that you can compare it with the print from which it is cut, is a piece of the print which has been "steeped in cold water for six days, the temperature then raised to 200°, at which it remained for twelve hours." Here is another, "soaked in cold water for six days, then boiled for six consecutive hours," and a second part of the same, which was "hung up in an oven for six days, in a temperature varying from 200° to 400°; unchanged, if anything rather improved," is the concluding remark, and you can see for yourselves that it is so. I dare say, gentlemen, you have read *Alice in Wonderland* and *Alice in the Looking-glass*, and will

remember how the grinning Cheshire cat sitting on the branch of a tree gradually disappeared until nothing but the grin remained, which also vanished after a time, because there was no Cheshire cat left for it to exhibit itself upon; if so, it will help you to understand the behaviour of one of Mr. Pouncy's prints under the action of still more energetic agents than those I have mentioned, by means of which agents the operator succeeded in dissolving the paper of the print, leaving floating on the surface of the liquid the picture, which only broke up through lack of a support upon which to exhibit itself.

Having succeeded in producing pictures in one tint of oil colour, Mr. Pouncy next applied himself to the production of oil prints in any colour; in this he was also successful. The oil prints I showed you just now were of a greyish black tint; this portrait of Miss Kate Terry on panel is of a decidedly brown tint.

From the production of prints in any one colour to the reproduction of paintings in the colours of the originals, and of portraits and landscapes in oil colour, was a natural sequence. The experiments made by Mr. Pouncy towards this end have been eminently successful, and have resulted in the discovery of the most perfect process for the reproduction of paintings that the artist could desire. I shall have the pleasure of showing you the most beautiful, and, as I think, the most perfect *facsimiles* of paintings ever seen wrought by this process. This picture, printed direct on canvas, is a copy of a little painting. The subject—two or three donkeys with the donkey girl on the seashore, with a little bit of hazy sea and cliffs in the distance—is a pretty little bit of composition, but it is not, I think, by any artist of standing. It is chiefly of interest as being the first painting ever printed by the process and as showing to what perfection it was brought from the first. The large painting here is a copy of George Morland's *Gipsy Camp*; it is said to be his masterpiece. Notice how exact a copy it is; even the brush marks are reproduced, and the impasting is on the copy as in the original. On this sheet of iron is an untouched copy of the same which has been enamelled on to the metal. The metal looks like zinc, but is iron. Zinc would not have stood the heat to which this has been subjected in the process of enamelling. The painting of the *Lambing Season* is an exact transcript of the original by Sidney Cooper. It was purchased for £300, and was borrowed by Mr. Pouncy, who told the owner that he would make three copies of it, and the owner might then come and select his own. "That will be easy enough," he said; "I shall know my painting among five hundred." "Then you will be the most severe critic we could have," was the reply. The owner came at the appointed time and found four *Lambing Seasons* in a row. He walked up and down the line and said, "Is my picture here?" "It is, sir," said an attendant, "for I hung it up myself." The owner lighted a cigar and walked up and down the line several times and said, "The glass over the paintings is a little confusing." "Your picture had glass over it, and I was obliged to glaze the others also, or you would have recognised your own from being different to the others." The owner again scrutinised the pictures for some little time, and then putting his finger upon his own painting he said, not "This is the one" but "Is this the one?"

The original of the *Wappen Schaw* before you was painted by John Faed, R.S.A., and was purchased by James Baird, Esq., for one thousand pounds. The painter, writing to Mr. Pouncy of this copy, said it was "as good a transcript of my original as can be produced. After mature and careful consideration of the principles and results of your invention I conclude that your *facsimiles* are the most perfect reproductions hitherto seen, therefore I shall have much pleasure in inspecting and signing the copies of my original." Accordingly you will observe that the copy is signed J. Faed.

You are competent, gentlemen, to form an opinion as to the artistic qualities of the paintings I have shown you, if you were not, you would probably accept the *Art Journal* as an independent and competent authority and critic. The *Art Journal* commenting on these pictures, said:—

"No one who has not seen specimens of paintings reproduced by the process in question can have any adequate idea of the wondrous fidelity of the copy to the original. No human copyist, of whatever skill possessed, could produce a work of such unerring accuracy, and such perfect fidelity of form and colour, light and shade, without variation of tint or tone, or subtlest effect of the original painter's skill. The manner of the pigment observed in the original is found in the copy. The chromo-lithograph, the oleograph, marvellous as they are as mechanical productions, present only a general imitation of the picture copied; the common eye knows them to be copies, since they are entirely wanting in individuality and force, while the *facsimiles* by this process are exactly what the term implies. They are not merely *facsimiles* of general effects, they are *facsimiles* of actual effect, and of every effect, even more completely than if the copy had been born of the original picture. For purposes of pleasure, or education, or connoisseurship they are complete. A small gallery of such pictures would be as adequate for the promotion of taste, or the education in the characteristics of the masters, as a gallery of the originals would be. The invention appears to be one of the most marvellous additions to imitative art ever made known."

But we have by no means exhausted the purposes to which this ingenious invention can be applied. Having successfully overcome all the difficulties in the way of presenting, by means of photography, exact *facsimiles* of paintings, and of natural objects in every tint of colour, Mr. Pouncy turned his attention to ceramic and japanners' colours, with which also, after many experiments, he was completely successful. Here

is a portrait burnt in on porcelain, another on *papier mache*, which has been stoved and varnished in the usual way. That large painting enamelled on to metal and fired, I have already shown you.

These paintings on panel, you will observe, have the appearance of having been painted in the richest sepia; the grain of the wood to which they are firmly attached shows up well in blank parts. They are so embedded into the very substance of the wood, that they can only be removed by planing off its surface.

In fact, there seems no end to the artistic application of this beautiful process. You will, doubtless, ask me how much artistic finish has been applied to the pictures I have shown you? It is a reasonable question, and I reply, To many of the pictures, none; to others so much, and of a similar kind, as would be applied to a carbon enlargement on opal or paper.

I will not detain you much longer, gentlemen. I have given you some account of the invention of carbon printing and photo-lithography. I have shown you specimens of work done by Mr. Pouncy's process of photographic printing in oil colours. I will only remind you once more of the great natural uses to which this invention might be applied.

By adopting it the South Kensington Art Department need no longer send out to the schools of art in connection with them the inferior paintings of inferior painters, since they can, at a much less expense, place as models before their pupils all over the country exact copies of the finest works of the painters' art in the kingdom so true to the originals that the painters themselves could not have made such exact replicas. Towns, for a very small sum, might possess galleries of the works of the great painters, and thus hasten the education of the nation in art.

And to what domestic uses might it not be applied! Our old mansions might be more richly adorned, the panels of panelled rooms, as well as the walls of the picture gallery, might bear scenes connected with the lives of the owners from photographs taken at the time. The festivities on the coming of age of the son, with portraits of all associated with them, might thus be handed down to posterity; the marriage of the daughter, hunting scenes, favourite animals, noteworthy events, might all be portrayed, the whole furnishing an imperishable pictorial record of the history of the life of each succeeding owner, containing exact portraits of each member of the family and household. Then, again, the porcelain, the metal work, all might be enriched by it. Indeed, the domestic uses to which the invention can be applied are innumerable.

W. MILES BARNES.

WHERE TO GO WITH THE CAMERA.

HASTINGS.

ABOUT this time of the year you begin by asking yourself, "Where shall I spend my holidays?" in your own mind already determined it shall be the spot of the picturesque. Your wife blandly refuses to leave her home, which she thinks far preferable to being "left on the beach neglected, while you slave yourself with the camera, dashing all over the country. Up with the sun to secure such and such a *delightful effect*. Late hours at night developing trial plates. No morning promenade! No evening concerts! I much prefer to stay at home," &c. All this sort of thing you easily settle by a faithful promise to take only half the usual quantity of plates. Contentment reigns once more. Hastings shall be selected, a very get-at-able spot, with charming inland country. Passing over the ordeal of packing huge cases and portmanteaus, at the finish to find only a very small proportion of room for the pet apparatus. In goes camera, lens, and slides, jolly. Now where goes lamp, developing trays, and solutions? No room. Happy thought, the leather bonnet-box; bonnets must go some other way, anywhere for them. Beautiful. All's well until it is found out, then comes a rapid eviction, and the trays, lamp, &c., are once more without home or habitation. No help but pack separate, vowing how nice it would be to find for the nonce at the other end a ready-made dark room with chemicals awaiting you.

Should you occupy new diggings and intend developing plates, fail not to acquaint your landlord or lady of your particular hobby horse. It will explain away a lot of your after seemingly peculiar habits. Provide sheets of oilcloth to cover tables and prevent indelible pyro stains, and a bad name equally as permanent.

A run of two hours and you are high and dry at Hastings, surrounded with such an amount of camera work you are bothered where to commence.

On windy days, making foliage impossible, make way towards the old Castle, which produces a charming picture, the ruin being a most picturesque one. After paying your admission money, and by way of policy go through the form of asking permission to photograph, when you will be requested to give your pledge not to in any way damage the grass. Several fine views are to be had from the grounds. The Castle is Father Antiquity itself, standing at the extreme edge of a tremendous high cliff. Tradition kindly informs us it was built by the Romans and later on repaired by William the Conqueror. Evidently the merry old Romans had a great weakness for security and built the outer walls eight feet in thickness. A favourable light for taking the old chapel occurs about midday. Very grand also are the coast views looking towards Eastbourne on the one hand and delightful hilly country on the other.

A tramp to Ecclesbourne Glen well repays the exertion of climbing a mountain, namely East Hill, nicknamed by the local working cobbler on

the door of his hut "Mount Zion." Arriving at the top was tempted to blow off one plate, hoping to secure a lasting remembrance, if only a slight one, of the old town buried in the hollow, snug and well sheltered by cliffs and hills. Passing along by the coastguard's station a magnificent seascape presents itself, now specked with innumerable yachts and pleasure boats gliding softly by. Remarkable at this distance how distinct can be heard the splashing of the waves mingled with merry voices of happy folk giving vent to song. The Glen with its rustic bridge—although nothing so rustic or effective as its predecessor—is nevertheless a composing portion, forming a very pleasing bit. Photography, alas! with its limited gradation, cannot do justice to the delightful foliage surrounding, and gives but an idea only in skeleton outline. Palette only can reproduce the enchanting spot. To those it may concern let me say the light here is most deceptive, causing me to much under expose both plates. Do not mind giving a long time. Rather more than a mile further on you reach Fairlight Glen and the renowned Lover's Seat. Alp climbing to reach, I found here an old fellow performing small miracles, namely, carving ivory toothpicks and paper knives from pieces of bone, enhancing their intrinsic value by inserting a microscopic photograph. For one day this trip is enough; a shilling can be well spent with riding home by road.

A short distance from the town is Battle Abbey, standing well and making a noble picture, this most historic pile commemorating the battle with the invading Normans, and marks the spot where Harold fell in the year 1066. The gateway remains in good preservation, and easily done, which cannot be said for pictures within the gateway, it being almost impossible to receive permission for this purpose. Leaving the camera outside it well repays a visit, if only to hear the very risky, risky story told *en route* by the guide and to note how clever he generalises the finish, that you must pass individually through a narrow door, at which he poses himself all smiles awaiting your generous and kind gratuity. Two and a half miles across a pretty country, passing by an avenue of trees with distant rustic gate (a good return for one plate), you reach Normanhurst, the seat of Lord Brassey. Each Tuesday during the summer season the house is open to the public, an opportunity every visitor should embrace. Special attention may be given the library, containing the collection of curiosities made by Lady Brassey on her famous voyage in the yacht "Sunbeam." Also notice the handsome box acting duty for a letter basket, covered with pictures made by the lady herself. Visit the room containing old and rare china, mounted birds, moths, and butterflies of every conceivable plumage and nationality, and the sumptuous yellow satin wall hangings of Chinese manufacture. Permission should be obtained to photograph the grounds. The Lodge cottage is pretty and easily done from the road.

At least two or three days only would suffice to make characteristic studies among the queer old huts, boats, &c., at Old Hastings proper. Here you may always find natural and ready-made groups of men and boys unloading fishing boats, mending and making nets, and otherwise employed or unemployed as the case may be, but forming pleasing lines dear to the artist. Pictures jump upon you, as it were, full ready for "snatching." In their everyday attire fishermen are very good pictures, but very shy ones indeed. A faintest glimpse of a camera approaching will put them to flight. Should they not compose just to your wishes—wait, do not disturb, as any amount of coaxing will not retain them. I made this early mistake, and as a last chance promised to stand a large mug of beer to no purpose. A long, lean youth, who considered the trousers pockets the only and correct place for his hands, sowed seeds of discontent among them by remarking the offer was "too good!"

The lifeboat house with distant cliffs forms a good result. The beach again, roaming among groups of children fully equipped with spade and pails for seaside merriment, make always pleasing pictures, and at times useful foregrounds. Again, the "Peerless Pier" deserves a little consideration.

Making it a rule to work only under favourable conditions, was wind and weather bound for two or three days. Found the beach pleasantly entertaining. At times highly amused to watch and catch rapid glances of two cameras and three young gentlemen hopping and darting about in a manner most lively, with apparently no fixed idea what to do, but fully determined "to do" anything and everything. Instantaneous shutters are at times necessary evils, but its purpose is far fetched, I think, when its manipulator occupies a prominent position on the Parade, congregating a crowd of nervous spectators watching his fierce expression and marble attitude, awaiting a special wave, or favourable chiaroscuro. I trust I am an enthusiast! For an exposure have risked my precious (?) life on the extreme of many hundred feet above the sea level; to reach a much-wished sandbank, seen ungracefully carried thither by a broad-shouldered fisherman; under pretence of bathing engaged a machine, and when nicely out to sea opened reverse door and fired away to my heart's content—and surprise of the proprietor! But I do draw the line at stopping a public thoroughfare.

One and a quarter miles from St. Leonards, a pleasant country, you have Hollington Church, situated in the midst of a wood; a quaint structure, with corresponding graveyard. This church is much patronised by the sketching fraternity.

Once again to Hastings, you are within reasonable distance of antique Rye, with its queer old Landgate Tower and quaintest of churches; Revensee, where William landed his sixty thousand, brave and strong, Castle said to be the "most perfect of the castellated Roman remains;" Hurstmonceux Castle, again, is very picturesque; also Camber Castle and

the old Grey Friars. I mention a few castles knowing how dear they are to many amateurs. To those not this way content, can always find their wants met in delightful and healthy Sussex. T. COAX.

A VOYAGE TO THE MOON.

[A Communication to the Photographic Section of the American Institute.]

The moon has been conceded an object of interest in all time and by all people. We find it is mentioned in the most ancient writings of the ecclesiastical and the profane. The rude and the barbarian have looked upon it with awe and wonder. The civilised and enlightened have studied its ever-changing phases with deeper interest than any other visible non-terrestrial object. Very many mothers have taught their children that the man whose image they pointed out on its surface was an object of terror, whose bundle of sticks often came to the backs of disobedient youth. The savage and uncivilised have counted their seasons and the length of their lives by its lunations. Lovers in many climes have whispered their joys and pledged their fealty by its reflected light, and counted the first circle of its changes after their union as the honeyed period of human existence.

To the astronomer the moon has ever been an object of primary interest. It has been the first object to fix his attention when his newly adjusted telescope is used for actual observation. He may try its penetrating power upon some star group in the distance of unfathomable space, or seek a test for its definition upon the satellites of some great planet, or the separation of a star from its companion, but his first enthusiastic study is almost sure to be the surface of that luminary which has all his days been an unanswered question. The student of nature is not content with the opinions of others when equipped with a first-class telescope; he wants the personal "I see" upon which to base his opinions regarding a subject upon which so many conflicting arguments have been advanced. He has learned that the moon's distance from the earth has been accurately measured, that its mass has been calculated, and its density determined. These are facts which have been mathematically demonstrated. He has been taught that "figures do not lie," but he is often a little sceptical regarding the truthfulness of all the theories of those who have made the figures. He wants to go over the ground himself; and that there really is ground for him to go over is the one fact for the demonstration of which some proof is now offered. When contemplating a long journey, we usually study certain conditions which it is expected may be met with. But in our present case, of whom shall we inquire? By one careful observer we are told that the temperature of the whole country we seek is far above any place on the earth; in fact that millions of years of unclouded sunshine, where the days are 354½ hours long, has changed the whole surface to a field of glass; that all water and air have been burned out of existence. Another tells us that the surface is a vast field of ice, and that there is plenty of the rarest kind of air. That, instead of crawling along, as we do here on the earth, pressed down by a load of fifteen pounds to every square inch of our superficial measurement, we would there be so cheered and buoyed up by our surroundings, that the heaviest person in our party would weigh less than thirty pounds. Competent engineers tell us, after careful measurement, they find that our journey would be one of more than 238,000 miles, a distance for the travelling of which a fast express train requires about three hundred days.

One of our party suggested that we should go early in the evening, as the moon must then be much nearer than when far up in the zenith. But that is a mistake. When the moon is just above our horizon the length of our journey would be about 4000 miles greater than when she appears highest in the heavens. The moon looks nearer when on our horizon, because we compare it with terrestrial objects in the field of vision. To dispel the illusion, look at the rising moon through a tube which will shut other objects from the view. A newspaper or large sheet of wrapping paper, rolled to a diameter of one or two inches, will serve for the experiment. Apparent size is often far from the actual. As an illustration of this, most of us would say that the moon looks as large as the sun. But in reality it contains only $\frac{1}{170,000,000}$ part as such matter; this apparent similarity of size resulting from the sun being four hundred times further from us.

One of the most curious and interesting relations of the earth and moon is found in the rotation of the moon around its own axis in the exact time required to swing in its orbit around the earth; consequently the same side is always towards the earth. And if the moon had no libration, we would never see more than one hemisphere of its surface; but as the moon has a swinging motion, similar to that of a slowly rotating top, some little distance beyond her north and south poles becomes visible. If the moon is inhabited, what a field there is for the enterprise of some lunar Cook, or other energetic excursion organizer, who would liberally advertise trips to see the earth. The length of the journey from the centre of the opposite side of the moon would be less than the distance between New York and San Francisco. He would very truly call the show a big one, and those who purchased his tickets would—when they came in sight of this world of ours—see an object more than fourteen times larger than any they had ever before looked upon.

A lunarian's walk by full earth-light must be a very brilliant affair in a light such as we would get from fourteen full moons. But time is pass-

ing, and each one must make his or her own calculations regarding the inhabitants of our satellite.

At the north-west corner of Second-avenue and Eleventh-street in this city stands a large, plain, well-built brick dwelling, which has during many years been the city home of a man known and esteemed among the great minds of his age as a leader whom it is safe to follow; a man the best years of whose life, and a large part of whose ample fortune, have been devoted to the advancement of astronomical science. To the older members of the section it will doubtless seem quite appropriate that we are thus reminded of the first President under whom our meetings were held, Lewis M. Rutherford.

To Mr. Rutherford is due the credit of organizing the plan by means of which the trip to the moon, partially described to-night, was made possible. Upon an ample lawn in the rear of the house before alluded to was erected, in the year 1856, one of the best private astronomical observatories of the time. The building is of brick, and in the main consists of a circular observing room, twenty feet in internal diameter, with a projection on the westerly side for transit and computing rooms. The twenty-foot dome of the observing room rests upon twelve wheels equally spaced in the iron coping of the brick wall. The lower edge or base of the dome is fitted with a band of cogs, which gear into a chain-belted wheel, actuated by a crank in the wall of the observing room. So admirably is this mechanism constructed, that the strength of a child is sufficient for setting it in motion. On two opposite sides of the dome, from base to apex, are openings, two feet in width, which are closed by shutters easily worked from below, and so devised as to screen the room from wind when open. In the centre of the room, resting upon a firm foundation, deeply imbedded in the fine sand underlying the whole building and grounds, stands the telescope pier, a broad, high block of stone, and around this, but not in contact with it, is laid the floor. In the transit room, 189 feet north-west of Second-avenue, and 76.3 feet north-east of Eleventh-street, the transit pier was erected.

The principal instrumental furnishings of the establishment consist of a first-class equatorially mounted telescope of 13 inches aperture and 14 feet focal length; the readings of position are upon 18 and 20-inch silver circles. The driving power is a Remontoir escapement clock of the highest merit. So accurate is its movements that the photographic image of faint stars, requiring long exposure, have a wonderful sharpness of outline.

The photographing of celestial bodies, attempted at various observatories previous to 1863, left much to be desired in definition. From some experiments made by Mr. Rutherford about that time, in connection with a Government expedition, he was led to believe that a lens could be so constructed as to greatly improve astronomical photography, and, by a purely scientific method, he began his work of solving the problem. By the use of the spectroscope he found that a lens of crown glass, so constructed as to shorten the focus of the observing telescope about $\frac{1}{10}$, gave promise of good results. Through the use of specially devised mechanism and methods of trial—the description of which would require too much time—he constructed with his own hands such a lens. Only those who have attempted to grind, polish, and correct a thirteen-inch lens can well understand the labour involved in such an undertaking. When, on the night of March 6, 1865, this newly devised method was proven to be correct, by the production of the first really good photograph of the moon, it was at once expected that photography would occupy an important position in science, and add greatly to the advance of astronomical observation. That such expectation has been and is now being realised, no one questions. Within the next few days will be held in Paris a congress of astronomers for the express purpose of apportioning the labour of making a photographic map of the entire heavens, and it is expected to complete the work within ten years, and that these plates will show a vast number of stars which no human eye has as yet seen, even with the aid of the most powerful instruments. Certainly, we may be pardoned for expressing a little pride in the fact that all this was begun more than twenty years ago by a citizen of New York and a member of our section of the American Institute. From his observatory we started for the moon, or rather, under its great revolving dome, found means for pulling the moon down, to be hung on the wall for our inspection.

Our party consisted of three persons, whom we will designate as Numbers One, Two, and Three. At 10.30 p.m. Number Two entered one of the computing rooms across the lawn and called "time," by reporting the zenith clear and the air still favourable for first-class work, a coincidence averaging about twice a-year in New York City. Upon this announcement Numbers One and Three bundle up in heavy clothing, as though about to visit the North Pole. They know the weather is crisp and cold where the next few hours are to be passed.

As they enter the door leading to the dome, under which stands the great equatorial, the silence is broken only by the escapement wheel of the tall sidereal clock standing against the western wall, as its heavy pendulum swings to and fro with an accuracy most wonderful. No other sound. Not a word is spoken; each knows his assigned duty, and to it he gives his undivided attention. All feel that such time is beyond value, and must be utilised to the fullest extent.

Number One has charge of the telescope. The dome is revolved into position, and a long, narrow section, from base to apex, swung open, leaving a strip of clear sky visible, in the centre of which the moon

glistens like a disc of burnished silver. The great instrument is swung into approximate position; the driving clock, constructed to run one hour, is wound; and while Number One is busy making his final adjustments, we will watch Number Two, who has charge of the photographic department of the expedition. He has lifted a trapdoor in the floor near the stone pier, passed down a short ladder, and entered what may well be called a troglodyte's laboratory, lighted by one small wax candle, as care is necessary to keep the temperature low. After a few minutes the pupils of his eyes are expanded sufficiently to permit seeing the bottles, baths, and dishes required for his work. But we have no time to describe his chemicals or his method of using them.

Meanwhile Number Three, the timekeeper, has adjusted the chronograph (in whose record there will be no personal equation), placed his small, dim lights where they will illuminate the clock and the room just enough to see what is going on, and then take his position, where he can hear distinctly the beat of the long pendulum, as its lower end, terminating in a hair-like wire, swings at each vibration through a glistening drop of mercury, closing the battery current uniting chronograph, clock, and shutter-adjustment on the telescope. All is now ready for action. Upon a signal being given by Number One, a sensitised plate is handed up from the cave, placed in its receptacle at the ocular end of the great instrument, just as it would be put into an ordinary camera. The touch of an electric button, and away we go, or rather, we all keep very still.

The great clock says one, two, three, and the plate holder is opened to the light of the full moon, whose image the great glass eye, fourteen feet away, has condensed to a circle of one and three-tenths of an inch. The buzz of the chronograph wheels is just audible as it records the time in hundredths of a second. The heavy pendulum has beat one, and the long focussed eye is closed, the plate-holder is returned to the troglodyte, who reaches from below to receive it, as he hands another up. And so the work goes on until early morning, when the weary and thoroughly chilled party seek rest in a comfortable temperature and among surroundings which their animal natures deem far more enjoyable.

One of the old Hindoo systems of theology taught that the souls of men could leave their bodies for short periods of time in quest of knowledge, where no human body could ever go, and upon their return, by imparting to their fellow men the wisdom thus gained, an endless existence of perfect happiness was secured. Thus wise must have been our trip to the moon. The mind or soul reached out with a question. Was it answered? Let us see if any knowledge gained can be imparted to others.

[Then followed the lantern exhibition of many slides, shadowing the moon's surface; its mountains, more than twenty thousand feet high; its craters, fifteen and eighteen thousand feet deep, and from one to three hundred miles in diameter, were graphically described, and an explanation of the various theories advanced regarding the existence of air and water on the moon's surface; and some of the arguments used in support of such theories were examined. Dr. Mason closed his paper and description of the work done at the observatory by expressing regret that the telescope had been recently placed in the observatory of Columbia College, where he feared vibration would prevent its use for fine photographic work.]

O. G. MASON.

THE ART OF MAKING PHOTOGRAVURES.

[A Communication to the Photographic Section of the American Institute.]

BETWEEN the years 1790 and 1802, Wedgwood and Davy attempted to utilise for artistic purposes the sensitiveness of the salts of silver to the action of light.

In 1839, Mungo Ponton, of Bristol, in England, announced the action of light on organic matters, such as gelatine, in presence of a bichromate.

In the fifteenth century may be placed the discovery of copperplate printing.

These three germs underlie the three essential elements of our process of photogravure, in which I am to endeavour to interest you to-night.

The first germ—that of the sensitiveness of the silver salts to light—is the germ from which has sprung the photographic negative. The second discovery—that of the action of light on organic matter in presence of a bichromate—is the germ of the photographically engraved, or photogravure, plate. The third gives the starting point of plate or intaglio printing.

I propose to trace briefly the growth of these elements to the condition in which you see them to-night.

The efforts of Wedgwood and Davy, who about 1800 projected on to a sheet of white paper, or leather, saturated with nitrate of silver, the shadow of the figure to be copied, the sun's rays darkening all but the shadow, were followed by the process of Niepce in 1814, who for the first time employed a camera, using bitumen or asphalt as the sensitive medium, and giving an exposure of some hours; then by the process of Daguerre in 1839, where the development of the latent image first occurs, thus reducing the exposures from hours to minutes.

Later, by the discovery of Herschel, in 1821, of the value of the hyposulphites for fixing purposes, a very important step; next, by the production of negatives from which positives could be printed, by Fox Talbot, in 1839; and, lastly, by the introduction of collodion, by Scott Archer, in 1851. It was this latter discovery that gave such an impetus to photography, so that it sprung at once into life as the new handmaid of art. For the next twenty or twenty-five years the history of the collodion process was the history of photography. But the undisputed reign of collodion finally came to an end, and for the last ten years the history of photography has been the history of the gelatine process. Gelatine, indeed, has been the vehicle by which photography has been carried into well-nigh every home and well-nigh every business. Yet, I think, many of us older hands look back with longing eyes, in spite of the many advantages of gelatine, to the crisp snap of the collodion negative, which gelatine has not been yet harnessed to give.

If I may venture the prediction, I think the history of photography for the next decade will be the history of orthochromatic work. Surely, next to the production of the colours themselves, there is nothing to be desired so much as the rendering of the true values of these colours. I place the orthochromatic or isochromatic negative as the highest point yet attained in negative making, and as constituting the outcome to-day of that germ that was brought into being nearly a hundred years ago.

The story of plate printing, the second of the three elements in photogravure, and the method of printing by which impressions are produced from photogravure plates, is shorter and much less revolutionary. It is still in about the same state that it has been from its infancy. The same laborious, painstaking method of working is used as at first, and just about the same style of press. That other method of printing, type printing, starting later than plate printing, has sprung up and has grown from the old Caxton handpress, printing a few hundred copies a day, into the modern power machine producing twice as many thousands an hour. Lithography has been born and grown to its present strength, but the old copperplate press has not moved. No means have yet been devised to do the work of the ball of the hand, and just as assuredly no results have been obtained approaching the exquisiteness of the steel or copperplate engraving.

In plate, or steelplate, or copperplate printing, the design to be printed is cut or incised into the surface of a steel or copperplate. This plate is dabbed all over with ink, which fills the incised lines and covers the surface as well. The ink on the surface is wiped off, with cloths and the hand, leaving only the ink in the incised lines. Paper placed on the plate, after heavy pressure has been applied to the back of it, when lifted, withdraws the ink from the lines, leaving the design, which was on the plate, adherent to the paper.

The most probable origin of the art of printing from metallic intaglio plates is that which is attributed to the early Italian workers in niello or inlaid modelling work, an art used for ornamenting table utensils, swords, armour, &c.

ERNEST EDWARDS.

(To be continued.)

HINTS ON COMPOSITION AND SELECTION OF SUBJECT.

[A Communication to the Philadelphia Amateur Photographic Club.]

AN important element of success in the pursuit of landscape photography is the attainment of the power of selection. Those persons who are naturally gifted with that kind of taste which enables them at once to perceive those combinations and effects in nature which will make the most agreeable or effective pictures are indeed fortunate, and although they may receive much gratification and instruction from looking at the works of eminent artists, and seeing under what effects they have treated the various scenes represented by them, such study is not so much a matter of necessity with them as with those who have been less favourably endowed. Sir Joshua Reynolds says: "Nothing is denied to well-directed labour; nothing is to be obtained without it;" so that none of us need despair of attaining excellence if we do but give our earnest attention to our pursuit.

Hundreds of views are constantly being made that are of no account whatever, except inasmuch as they may be pictures of places possessing interesting associations to those who are taking them; as we see in show-cases innumerable faces, admirably done, and each one highly interesting to self and friends, but passed over with the utmost indifference by everybody else. When the object becomes the making of a picture, the producing of a work which, from its possessing certain intrinsic qualities, giving it a wider interest, and ranking it as a work of art, more or less, it is necessary that we discriminate between the beautiful and commonplace in nature. It will not then do to set our camera up in the first country road that we come to and focus straight along it, being satisfied with its parallel sides, lined with stiff fencing and rows of straight-stemmed cedar

trees. We must go further and see if we cannot find a spot where nature will spread before us some of her unfettered charms. Trees, remarkable either for the lightness and grace which characterises some varieties, the fullness which marks others in the vigour of maturity, or for the picturesque ruggedness of decay; some sheet of water, even though it be not river or lake, where we will get mirrored reflections, sparkling lights, and flat, quiet masses of shadow. If we can get a mountain peep in the distance, how fortunate; if not, perhaps we can find a rolling country, dotted with receding masses or groups of fine foliage. And our foreground, let us, if possible, secure some variety in it. Bare earth varied by patches of vegetation, rocks, stumps, and old logs, rather than flat, unbroken stretches of either grass or earth.

Having arrived at a point where we have found some elements of a good picture, let us so compare them by moving from point to point that we get our distance open, and our main groups on either side; but let the group of one side be more important, if possible, than that of the other. There is nothing which makes a more picturesque contrast than a fine, full mass of foliage balancing some quaint, denuded stem, festooned with vines. Our foreground should have some important feature of interest, either suitable figures, cattle, or something striking in form, or light and dark, and not precisely in the centre, but generally a little to one side or the other. It is seldom that such points can be put down in the extreme corners with good effect, as they carry the eye out too far from the centre of the work. Although the plan of composition is occasionally tried by landscape painters of placing the principal group of trees in the centre of the work, it is seldom successful, the open spaces of distance, seen upon either side, equally arresting the attention, and so dividing it that the work is robbed of that unity of impression which should go towards making it agreeable.

There is at the present time a prevailing want of interest in and sympathy with the good art principles seen in the works of the eminent landscape painters who were living and working during the first half of this century, and it is chiefly the outcome of Ruskin's pre-Raffaellite movement. This school and their adherents strove to attain certain sentimental qualities which scarcely belonged to the province of art to convey, and the only art quality which they perfected was that of imitation, which is considered the lowest quality of art; and as genuine pre-Raffaellism was dying out, the great period of scientific investigation set in, turning the minds of reading and thinking people in the direction of materialism and research; and the consequence is that now a picture is not valued as a piece of beautiful colouring, or composition, or effect, as it was formerly, but it must tell some story, or be a wonderful piece of imitation of something, it matters not much what.

Many pictures that are painted now have so little true art in them, and are so solely dependent upon the incident they represent for their aim, that a simple pen sketch would fulfil their purpose just as well as the painting. I think this is somewhat to be regretted, and I hope that a taste may grow up again more in sympathy with true art. Turner, Stanfield, and the many good landscape painters who were working contemporarily with them, seldom, if ever, dealt with nature in her commonplaceness. They sought her out in the picturesque and the beautiful, and did not scruple to gather together what was near and characteristic to a neighbourhood to enrich and beautify their compositions; they delighted in the effects of storm and cloud and sunshine, which give grandeur and poetry to a scene; and I was going on to speak of their colouring, but this we have nothing to do with. When we can fix the image as seen on the focussing screen, colouring included, as we do the light and dark alone, the painter's occupation will indeed be gone.

As we must confine ourselves exclusively to composition and effect, let us consider a few of the first principles to be looked after in the successful getting up of a picture. Working, or rather presenting our subjects as we do upon a flat surface, every artifice should be used to overcome this perpendicularity of plane, and have the effect of leading the eye into the picture. Judicious composition and a proper amount of atmosphere are great aids in the retiring of distant objects and the advancing of nearer ones.

A picture in which a number of conspicuous objects come one over the other, or successively one under another, must appear flat, and especially so if the objects just touch or cut upon one another, and it must to a great extent be by the lightening of shades that we get a distance to recede into the picture. In a landscape reproduction, where our shadows are as black in objects miles off as they are in the immediate foreground, claiming an equal attention, we can get no retirement, and by cutting definitely and harshly against the sky in every part a disagreeable hardness is given to the picture. As a means of obviating this hardness, in addition to working during a prevalence of atmosphere or haze, I would recommend, whenever possible, the introduction of skies, either by printing in or by washing on the back of the negative with a little opaque. When the sky in the negative is not too dense the latter plan will answer very well, and the addition of a sky to a landscape view is of immense value not only on account of breaking up the flat blank space, but it may be made the means of completing the composition of the work; it also serves to carry off the distant features gradually, and repeats the dark tints of the foreground. There are, however, two conditions when skies are better left out; the one when they are got by laying cotton indiscriminately, and the other when printed in from negatives that are too

strong and too bold in their masses, and either overpower the subject of the picture completely, or else divide the attention too much with it, and thereby rob it of its precedence.

XANTHUS SMITH.

(To be continued.)

COMPOSITE PHOTOGRAPHS.

An interesting craze in photography is the effort to produce what is called the "composite" photograph. This means a succession of photographic impressions imposed one upon the other in the same plate, so as to produce in a single picture the combined likenesses of various persons. For instance, three or more people are to be "averaged," so to speak, upon the sensitive plate. First, one is posed before the camera, in direct front or profile view, for such a fraction of the time as would ordinarily be given to one sitter as may represent the number of persons to be photographed. If three persons are to be represented, and the full time of exposure would be six seconds, the exposure for the first one of the three would be exactly two seconds. He now steps aside, and the second one is adjusted to the *head-rest*, and, when accurately placed, he in turn gets a sitting of two seconds, and so with the third or fourth. Each one who sits before the camera represents his proportion of the full time required. So, in the case of twenty, the instrument must be so stopped down and the light so arranged that, if used upon a single sitter only, the exposure would be twenty seconds. Of course the exposure to each one of the twenty would be one second. Recently I made one of these composite pictures of nine young ladies, members of a literary club. The result would certainly indicate a high average of intellectual ability, if there is anything in the teachings of physiognomy or phrenology. My method of working is different, and, I think, much more simple than that followed by others, as the result is obtained in one operation. As I understand the previous methods, each person has been photographed separately, and from the negatives a transparency has been made, and these each in turn copied on to one plate. I see no reason why the members of the composite should not be photographed directly upon the plate. My method for securing this picture was to so reduce the power of the light as to make necessary an exposure of eighteen seconds. As there were nine sitters the *pro rata* exposure was two seconds. Of course it required great care to superimpose exactly one image upon another. It was accomplished as follows:—I first drew upon the ground-glass a fine perpendicular pencil line, which served as a central line to the head. Across and at right angles to this line I drew two others, an inch and a quarter apart, one of which ran through the line of the mouth, and the other through the eye at the caruncula, or at the joining of the upper and lower cartilages. These lines were arbitrary, and the image was adjusted to them. Of course there is quite a variation in the distances between these two lines in the human head, therefore the camera had to be carefully adjusted after each exposure. As it was very difficult to do this by hand, I constructed adjustable boards hinged at one end, with fine screws, so placed under the camera as to elevate or depress it, and another screw to move the whole camera and bed plate forward or backward, until these distances between the eyes and mouth were made to correspond with the standard. I then made a pendulum by a weight on the end of a string, about forty inches long, practically giving one second to a motion or oscillation. This I found more practicable than a watch. Starting my pendulum, the impressions were made in quick succession. Of course the slide was returned to the holder after each exposure, and a new focus or adjustment of the succeeding sitter made. The only modification to the final picture consisted in uniting the white collars or neck-wear into one. I think it would be best in future experiments to have a dark or black silk kerchief with which to cover the white neck draping, which would give a simple, uniform effect to the upper part of the body.

In the pursuit of these experiments some curious developments occurred. At first I made the natural mistake, I think, of not taking into consideration what one must call the *momentum* of the sensitive particles from the first blow or stroke of the light. There is on the unexposed plate what the scientists call atomic inertia. On the first exposure this is in a degree overcome, and the particles of the sensitive compound receive motion from the impact of the light, which is continued to a degree after the cessation of the exposure. The apparent effect, of course, is to increase the sensitiveness of the plate, so that the exposure should not be equal on the successive subjects, but each exposure should be less than the initial one.

This overcoming of the atomic inertia is to me an explanation of the curious fact that instantaneous photographs were made in the old days of the wet plate process, when the plates were not one-fiftieth as sensitive to the action of a dim or subdued light as the present gelatino-bromide plates, when they were exposed to *brilliant* light.

For instance, successful photographs of waves in motion were made more than twenty years ago, under the illumination of the broad noonday sun, which would not be over exposed on the present super-sensitive plates. Yet in a subdued light the wet plates were in many instances unavailable where the bromide plates would now record a quick and successful picture, or, in other words, the later bromide plates are more

successful to feeble rays of light than the wet; but in brilliant lights there is comparatively less difference in the sensibility. Hence, I think the stroke, blow, or impact of the bright ray overcomes this atomic inertia, imparting a momentum to the sensitive particles which continues after the light is closed.

Now, if this be so, is there not a liability to error in experiments in this line? While I believe that in the picture of the young ladies' club, a fair and characteristic "average" is presented, I can readily see how one of the young ladies with round, smooth face, blonde complexion, and flaxen hair, could, if not guarded against, have neutralised the impression of all the rest, if they were of a darker style. As I have intimated, after the sensitive film has been decomposed by the action of light—by the reflection from white or light objects—it cannot be undone or modified by any exposure upon dark objects. So, if one should take a series of impressions from aged persons with faces full of lines and shadows, a fair young face would fill in all these shadows, and it matters not in what order it comes. If the smooth, white face makes its image in light, the faces full of shadow will not change that result. To demonstrate this, I first made a composite picture of a number of middle-aged persons, and, finally, took an equal (*i.e.*, proportionate) exposure from a child's face. The average of the faces is not fifty years, but apparently much younger. Now, while this does not prove that an average cannot be made, it does show that the greatest care must be taken to prevent one face from producing a paramount effect upon all the others. A simple illustration of this is that, although one only of the young ladies in my group had light trimming on her dress, it made itself quite apparent in the picture, although all of the rest wore plain, dark dresses.

GEORGE G. ROCKWOOD, in *Art Amateur*, N.Y.

WINFIELD MANOR IN DERBYSHIRE.

[A Communication to the Derby Photographic Society.]

THOUGH these ruins have enough of beauty in themselves to please the photographer, yet I have thought a little information regarding their origin and past history cannot but enhance their attractions, and with this view have put together the following notes:—

Winfield Manor, fourteen miles from Derby, is perhaps one of the finest memorials of ancient architectural splendour we have left, and though shorn of its glory still presents to the appreciative eye many points of beauty worthy of the canvas or the camera. To the poet, historian, or archæologist, the ruins of this fortified mansion are full of interest, carrying him back to scenes of chivalry and feudal power. I must only glance at its past history; its present condition you have had ample means of studying and enjoying.

Winfield Manor boasts of a green old age, and we know but little about it till the time of William the Conqueror, who gave this, with other manors in Derbyshire, to his natural son, William Peverel. Robert de Heriz, earl of Brittany, held the manor under Peverel, and it continued in the possession of this family for many generations after the flight of Peverel and the forfeiture of his lands to Henry II. Richard de la River married the heiress of the Heriz family, and was the next owner, and his daughter, Margaret, became the wife of Roger Bellars, sheriff of Nottingham and Derby in the reign of Edward III. Their daughter, also named Margaret, married Robert de Swyllington, knight, and her father gave her the manor of Winfield with other lands of her mother's. This last-named pair having no offspring, it was found by an inquisition taken at Derby, Oct. 25, 8th Henry VI., that the property belonged to Ralph, Lord Cromwell, of Tattershall, descended from the Bellars family, and cousin of Margaret, wife of Robert de Swyllington. A lawsuit was instituted, which ended in a compromise, the manor of Winfield remaining in the possession of Lord Cromwell. This Lord Cromwell was a man of great importance in his day, holding many high and lucrative offices. He set to work building this magnificent place on the site of a more ancient structure. It was, however, completed by John Talbot, second earl of Shrewsbury, to whom he had sold the reversionary interest in the manor, and in whose family it remained till 1709.

Four and a half centuries have passed since these walls were raised, and yet they are as strong as ever where time only has affected them. But war and wanton destruction have been at work, the marks of cannon balls can yet be seen on the walls, and the hideous house in the valley below was built from the ready-worked stones of this structure.

In 1569, Mary, Queen of Scots, was brought here, a prisoner, from Tutbury Castle, where she had resided for more than a year previously, a prisoner of state, in the custody of George Talbot, sixth earl of Shrewsbury, the fourth and last husband of the celebrated "Beast of Hardwick." For nine or ten years was the beautiful Queen of Scots in the care of this Earl at divers places, and between his jealous wife and Queen Elizabeth he led a most miserable life. The memory of the hapless Queen will haunt the mind as one wanders amongst these ruins grey and ponders over the times of old: how she and her maids spent their time in needlework, when "the diversitie of the colours made the worke seme lesse tedious;" how attempts were made to liberate her by young Anthony Babington of Dethick and other conspirators, who met at his house only four miles away—of their failure, trial, and barbarous execution.

These plots of Mary's friends hastened the time of her own mock trial

and execution, for Elizabeth deemed her life and throne insecure, and was thus led to sign the death-warrant which will ever be a blot on her memory. No less than two hundred gentlemen, yeomen, officers and soldiers were employed in the custody of Mary at Winfield. Her own establishment at this time included five gentlemen, fourteen servants, three cooks, four boys, three gentlemen's men, six gentlewomen, two wives, and ten wenches and children. They consumed a large quantity of wine, and no wonder her guardian was embarrassed in providing for so large an addition to his household. The suite of rooms on the west side of the inner court, and connected with the great tower, are said to have been those occupied by the unfortunate Queen.

During the civil wars Winfield Manor was the scene of many struggles between the Royalists and Parliamentarians, and several hotly-contested engagements took place—first one party and then the other gaining the ascendancy. In the last siege Sir John Gell planted his cannon on Pentridge Common, on the opposite side of the valley, but could not effect a breach. Coming within nearer range, and being strengthened by a division of the Earl of Manchester's army, the gallant defenders were obliged to surrender, their Governor, Colonel Dalby, having been killed during the conflict. On the 23rd June, 1646, an order in Parliament was issued directing that the place should be dismantled, and from this time it was allowed gradually to fall into decay, the dilapidations which strife had effected being hastened by some who looked on the pile only as a heap of quarried stone, to be used as required for any and every purpose. The sun dials you see about the ruins were placed there by Imanuel Halton, who purchased the manor in 1678. He was a man of studious and retiring habits, pursuing the studies of music, mathematics, and astronomy. He took up his abode here, and did not scruple to pull the place about to make it to his own liking. A successor of his did far worse in removing the stones to build the ugly house I mentioned before. The ruins are, however, now carefully preserved from further demolition, and will long remain to adorn the landscape and afford interest to the antiquary and lover of history, subjects for the painter and photographer, and pleasure to the thousands who seek for recreation in visiting the ancient landmarks of their beautiful country.

Once—

"These now deserted rooms were wont to ring
With laughter and the bacchanalian song,
And startled echo flew from wing to wing,
Repeating sounds of mirth with mimic tongue."

Now—

"These spacious rooms are silent as the dead:
Without a sound my footstep lightly falls;
A grassy carpet on the floor is spread,
And echo slumbers not in roofless walls."

I have made my sketch as concise as possible and have not attempted any description of the ruins by which we are surrounded; their great artistic beauty you will all acknowledge, but should any of you wish to know any more about the building itself, I will gladly be your guide.

RICHARD KEENE.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 10,533.—"Improved Folding Pocket Camera." W. WATSON.—Dated July 29, 1887.

PATENTS COMPLETED.

AN IMPROVED PORTABLE PHOTOGRAPHIC APPARATUS.

No. 11,365. HENRY JOHN COOKE, 7, Westminster Chambers, Victoria-street, Westminster.—September 7, 1886.

UP to the present time all instantaneous photographing apparatus have been called portable, but none have really ever fulfilled this object, as they have necessitated a great paraphernalia, such as stands, &c. The best way to describe the disadvantages of these apparatus is, that the operator is unable to hide from the public gaze what he is about to do, owing to the quantity of apparatus he is obliged to carry about with him, and he is immediately recognised as a photographer. Another inconvenience of the old apparatus is that before taking a photograph the operator is obliged to arrange the focus, or when desirous of photographing a moving object it is impossible to adjust the focus before the object has changed position or has disappeared, so that it is impossible to fix the object on the sensitive plate. Independently of the weight and size the difficulty has hitherto been to make a portable apparatus which can be carried without attracting attention, and to take instantaneously either moving or fixed objects without first having to arrange the focus. It is this perfected apparatus that I have invented, and which is essentially portable, weighing as it does little over 1 lb.; it can be carried by a strap in a similar way to a field-glass, and can be handled just as easily, or it may be worn under the waistcoat, the lens serving as a button, being so carried as to leave both hands perfectly free. Its speciality is in taking groups in action, figures, birds, facial expressions, and all studies in animal life, where opportunities to sketch or to set up an ordinary camera and arrange the focus are out of the question, making it, therefore, invaluable to artists, engineers, police, and tourists.

My Improved Portable Photographic Apparatus is composed of a metal disc about six inches in diameter and about one inch thick; when preparing to use it the object glass or lens is fixed on one of the sides.

The disc is made in two parts, fitting closely one into the other. The first part contains inside the mechanism of an instantaneous moving shutter, moved by a slight rod worked by pulling a knob on the outside, which is unclined

by pressure on a second stop-knob or cheek. The second part contains the interior, the sensitive plates for taking the photographs, which may be five, ten, or any other number, according to the diameter of the apparatus or the size of the photographic plates which are put in the apparatus. For instance, in the apparatus which I more particularly describe later on there are five plates. The space where the sensitive plates are placed is shut in with a ring, which can at will be moved from right to left, or *vice versa*, so as to substitute a fresh sensitive plate for the one used in taking an object.

This operation having been done, and plate No. 2 having taken the place of plate No. 1, the next thing is to arm the shutter system, as I have already described, and to lower the central ratchet in the direction of the rod, which is fitted with a spring, so that the apparatus is again ready for work, and you can sight the object you wish to take, letting the apparatus be in such a position that a line passing by the spring rod, the centre of the apparatus, and the objective, shall be vertical to the ground; all that is then necessary is to press the restraining knob so that the object fixes itself on the sensitive plate. The same process is continued until all the plates held in the chamber have been used in succession. Care must be taken that when changing the plates the central ratchet be brought back to the horizontal.

This ratchet moves an interior plate which comes and stops the shutters and allows to present successively the plates to the objective without permitting the light to spoil them. Were this detail forgotten and the sensitive plate allowed to come into contact with the light they would be spoiled. When the first chamber, full of plates, is exhausted, it can be removed from the disc and another substituted. It depends on the operator how many plates he chooses to take with him. These operations once made there is nothing further to do than to take out the sensitive plates used and to make them undergo in a dark chamber the ordinary process of photography.

[Here follow the details of construction, illustrated by diagrams.]

IMPROVEMENTS IN THE MANUFACTURE OF SODIUM SULPHITES.

No. 11,518. JOHN MARTIN COLLETT, High Orchard, Gloucester.—September 10, 1886.

This invention consists in the manufacture of a new form or condition of sulphite or bisulphite of sodium, differing from that ordinarily produced in being amorphous, anhydrous, or nearly so, and practically unchangeable in the air.

I procure this salt by treating dry hydrate of sodium, either in lump or a powdered state, with sulphurous acid gas, this latter being prepared by any of the usual methods.

I place hydrate of sodium, as above mentioned, in a suitable vessel provided with a stirrer or apparatus for moving it about, or the vessel may be made to revolve, and I pass in sulphurous acid gas until the base is converted to the sulphite or bisulphite as required.

The claim is:—Certain improvements in the manufacture of sodium sulphites, as above set forth.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Dats of Meeting.	Names of Society.	Places of Meeting.
August 9.....	Manchester Amateur	Masonic Hall, Cooper-st., Manchstr.
" 9.....	Derby	Sykes's Restaurant, 33, Victoria-st.
" 9.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 10.....	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 11.....	Birkenhead	Free Public Library, Hamilton-st.
" 11.....	Bradford Amateur	Grammar School.
" 11.....	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

On Thursday night, July 28, at the adjourned annual general meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. J. Traill Taylor presided.

The HON. SECRETARY, Mr. J. J. Briginshaw, then read the Annual Report, as follows:—

Another year has passed in the history of the Association, confirming a further period of usefulness and prosperity, proved by the well attended meetings each week, the steady accession of members throughout the year, together with the balance in the hands of your Treasurer.

Although no new photographic process has been developed during the past year, the applications of photography are so manifold, and the experiences of its workers so varied, that subjects for debate and discussion are regularly brought forward at each weekly meeting, and, however apparently unimportant the subject may appear, receives an equal share of attention with questions of larger import, the most trivial subject frequently leading to interesting and instructive debate. How much of the enormous advance photography has made of recent years is due to society discussions and organization is not easy to determine. Photography, as a veritable handmaid to nature, science, and art, now plays no unimportant part in everyday life. Frequently a natural desire arises on the part of the tyro for a more extended and intimate knowledge of the chemical changes and combinations which take place at every stage of development. It is here that a society of this kind fills the want thus created; a commencement with a "hobby" often leading up to the study of the higher branches of science and art, may be directly or indirectly traced to the instrumentality of society discussions.

During the past season many excellent and interesting demonstrations have been given and papers read. Among these, *Woodbury Films*, W. K. Burton; *Collodio-Bromide Transparencies*, J. B. B. Wellington; *Development of Collodio-Chloride Prints*, J. Hubert; *Stripping Films*, W. K. Burton; *Platinotype Printing*, F. W. Edwards; *Isochromatic Photography*, J. B. B. Wellington; *Stripping Films*, Buchanan Wollaston; may be enumerated from the members; while from a visitor, Mr. E. J. Palmer, of Toronto, must be recorded an exceedingly ingenious plate coating machine shown in working.

It is always a pleasing duty to recognise favours conferred. To the proprietors of *THE BRITISH JOURNAL OF PHOTOGRAPHY*, *The Photographic News*, *Anthony's Bulletin*, and *The Photographic Times*, the best thanks of the members are due for their respective publications regularly mailed to this Association.

The most notable incident of the past year has been the formation of the Photographic Convention of the United Kingdom, which has been attended with the happiest results, and is destined to have a direct influence in the advancement of photography. Being associated and interested in its development and progress, the members of this Association may look with pardonable pride upon a movement that gives every promise of leading to many important results.

An exhibition of pictures taken by members during the Convention was subsequently held. Between two and three hundred prints were exhibited. These were chiefly in platinotype and silver. Paper and glass negatives, together with stripping films, were each represented, and afforded ample opportunity for an examination side by side of the results from these several processes. The exhibition proved very attractive, and created a considerable amount of interest among the members and their friends.

That the future position of photography among contemporary arts and sciences is assured may be gathered from the fact of its recognition for the first time in its history by the British Association last year. The successful meeting of the Photographic Convention held just previously at Derby may, however, be in some measure responsible for this.

The great popularity of the optical lantern remains unabated. It has now become firmly established as an indispensable accessory with all photographic societies. Scarcely a single branch of science or art that does not rely on the invaluable aid of the lantern for illustration. This has not been without its influence in creating a desire for greater perfection of transparencies. The past season has consequently witnessed lantern displays of a very high standard of merit. Periodical exhibitions with the optical lantern and oxyhydrogen light have been held, bringing large attendances of members, at which slides of great technical excellence—the work of the members—were shown on the screen. Keen interest was evinced in the instructive nature of these displays.

The entirely social element of the Association has been fully represented by the *soirée* and smoking concerts held during the winter season, organized by your Hon. Secretary. The large and enthusiastic audiences attracted on each occasion abundantly proved the popularity and enjoyable nature of these evenings.

The annual dinner, by general consent, was held in November instead of July, as heretofore, and was more largely attended than on any other previous year. Opportunity was taken to present your Hon. Secretary with a very substantial recognition of his past services in the interest of the Association generally. The testimonial—a handsome binocular microscope by Ross—was worthy of the Association and appreciated and valued in every sense by the recipient.

The members have had every cause for congratulation in the past, at the same time the future must not be forgotten. The Association has attained a high position, its proceedings are read with widespread interest, and frequent testimony has been tendered to the general popularity of the Association. This fact alone should make every individual jealous of its good name, and create a determination to work in continued hearty co-operation, by which alone the vigour and interests of a society can be maintained. It is not by mere attendances at the meetings or payment of subscription that the whole duty of a member is fulfilled, but rather by disinterested exertion springing from a deep interest and love for the art-science he is following. Let every member feel that he is to a certain extent individually responsible for the welfare of the Association. Genuine and earnest effort will thus be stimulated; this, with a steady maintenance of good fellowship and generosity in debate, cannot fail to place the Association on a still firmer basis and raise it to a still higher level.

The HON. SECRETARY next read the Treasurer's Report, which showed a balance in hand of £9 4s. 9d.

The foregoing reports were unanimously adopted. Votes of thanks were then given to various English and foreign proprietors of photographic periodicals for free copies of their journals posted regularly to the Association.

The HON. SECRETARY said that at the previous Committee meeting of the Association a Sub-Committee was appointed to revise the Rules, and to bring before the members at the annual general meeting any suggested alterations in the same. It held several meetings, and now advised the appointment of a Permanent Committee to attend to the affairs of the Association, and the major part of the suggested new rules were affected by the question whether such Permanent Committee were appointed or not; the completion of the revision of the Rules was, therefore, deferred until this point was decided. He would move the appointment of the Committee.

Mr. W. M. ASHMAN seconded this.

Mr. W. E. DEBENHAM said that the proposal was a radical change in a society which had worked well; he thought that notice of the proposed change should be given to all the members; he would express no opinion for or against the proposed change.

Mr. A. L. HENDERSON somewhat sympathised with Mr. Debenham's views.

On a division it was resolved that the question should be decided that evening. Messrs. A. HADDON, DEBENHAM, and COX, objected, on the ground that a decision that evening would be contrary to a rule of the Association, which provided that notice of constitutional changes must be posted one month in advance.

Mr. ASHMAN argued that the motion of the Hon. Secretary was in order.

The motion was carried by a majority of nine.

The following Committee was then appointed for one year, by way of experiment:—Messrs. W. M. Ashman, F. A. Bridge, E. Clifton, F. Collins, H. M. Hastings, A. L. Henderson, A. Mackie, and H. M. Smith.

Messrs. J. B. B. Wellington and J. Traill Taylor were elected Trustees; Mr. A. Haddon, Curator; Mr. W. H. Prestwich, Treasurer; and Mr. J. J. Briginshaw, Secretary.

Votes of thanks were given to the officers of the Association for their work during the past year.

Mr. HENDERSON had noticed that Mr. B. J. Edwards had just patented a cutting board for use when cutting glass plates; it looked remarkably like Mr. Cowan's plan. He (Mr. Henderson) had demonstrated once at that Association how a wire could be used to assist in dividing plates when cutting them.

The HON. SECRETARY read a letter from Professor Stebbing, of Paris, setting forth that he would inquire about the proposal emanating from Douai to hold an International Conference of Photographers in Paris at the time of the Exhibition in 1889. He wished the Secretary to give him particulars about the formation of the British Photographic Convention, as he intended to suggest to the French Photographic Society that some such annual gathering should be held in France.

Mr. A. MACKIE said that at the last meeting he did not state that the name of the Photographers' Benevolent Association had been used without its consent in connection with the Stereoscopic Company's coming Exhibition, but that the names of individual members of the Association had been published in connection therewith without their consent.

The Hon. Secretary passed round prospectuses just received of the coming Exhibition of the Royal Cornwall Polytechnic Society.

The CHAIRMAN called attention to a curious case of flare with a single achromatic landscape lens, due to the possessor having made certain alterations in it which necessitated new positions for the stop to avoid flare. It was a little unusual, he said, to obtain a flare spot with landscape lenses. The best way to discover flare was to have a good black tree in front of the lens, hiding the light pretty thoroughly, and obscuring two-thirds of the plate, but elsewhere to have bright sky; then throw a very black focussing cloth over the head and any flare will be apparent.

The CHAIRMAN said that there were two questions in the box; one was, "Why did not makers back plates?" and the other was, "What is the most severe test for the presence of silver in the whites of finished prints upon albumenised paper?"

In consequence of the late hour the consideration of these questions was adjourned.

Mr. HENDERSON called attention to some little spots which had gradually developed in negatives.

Mr. DEBENHAM said that they were no doubt due to incomplete fixing.

Mr. W. H. HARRISON remarked that once he had asked Dr. Stierlin-Hanser, of Rigi Scheideck, a former public analyst to the city of Lucerne, why dry plates were not fixed when they appeared to the eye to be fixed, so that they had to be left some time longer in the hypo. His reply was that the film was swollen with water and to the eye looked transparent, but that when the plate was put under the microscope the undissolved particles became visible, for they were present all the time.

The meeting then broke up.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting was held on July 23 at the Royal Institution,—The President, Mr. George H. Rutter, in the chair.

The minutes of the last meeting were read and confirmed.

The HON. SECRETARY called attention to the circular of the Photographic Society of Great Britain in connection with their annual exhibition; he also exhibited Tylar's metal dark slide, which was kindly sent by the maker for the inspection of the Association.

Mr. P. Lange exhibited a series of prints in platinotype, the result of one afternoon's work with his detective camera.

Mr. B. J. Sayce exhibited two prints from the Speke Hall excursion—both taken from negatives on Eastman paper—one an outdoor view full against the sun, the other an interior with thirty-six minutes exposure, and both perfectly free from halation.

Mr. Rutter showed J. Watts's "Bijen Actinometer," which was approved of on account of its portability and extreme cheapness, containing all necessary tables on the lid.

Mr. W. Rogers showed the "Secret or Vest Detective Camera," going underneath the waistcoat, the lens protruding through a buttonhole, which takes six pictures on a circular plate, and is quite unobtrusive.

Mr. B. Boothroyd showed Sargent's shutter, made by Stanley.

Mr. RUTTER read the report of the Lydiat excursion, participated in by nine members, visiting Lydiat Old Hall and Sefton Church, when fifty-nine exposures were made; also of excursion to Stokesay and Ludlow, when only three members took part and made thirty-eight exposures.

Mr. EARP read the report on the Speke Hall excursion, which was attended by thirteen members and four friends.

Mr. A. W. BEER read the paper of the evening—*A Few Old Fashioned Notes on a Modern Error; or, Humour the Plate and Save the Negative*, in which he strongly advocated slow development. He pointed out whilst plates exposed under "perfect conditions" were easy enough to develop, using any plate and any developer, that many plates were lost through the amateur exposing a series of plates under varying conditions and attempting to develop them all in the same manner. He strongly advocated the use of what is known as the American Standard Developer, composed as follows:—No. 1. Three ounces of ferrocyanide of potassium, three ounces of pure carbonate of potash, three ounces of carbonate of soda, thirty-two ounces of water. No. 2. Three ounces of sulphite of soda, thirty ounces of water; and for 10×8 plate, taking dry pyrogallol acid, six grains; No. 2, four ounces; and of No. 1, if the plate is likely to be fully exposed, half a drachm (instead of half an ounce, as usually recommended), and five drops of a ten per cent. solution of potassium bromide. If no development appears in five minutes he adds another half drachm of No. 1, which in nineteen cases out of twenty will cause it to progress "quietly and sedately." If after five minutes more it is not sufficiently dense it might have another half drachm; but, above all things, "Don't hurry."

Some discussion arose on the question of using "dry pyro," several members affirming that properly made "sulpho-pyrogallol" would keep good any reasonable length of time, and was more convenient to use. It was pointed out that instances of pyro made up with sulphite of soda going black were due to alkalinity, and that if the solution were made acid it would keep.

Mr. BEER, however, thought that in any case the solution was uncertain, and that dry pyro went farther in development than pyro in solution.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The monthly meeting of the above was held at the Technical Schools, Bridge-street, on the 28th ultimo,—Mr. W. J. Harrison, F.G.S., in the chair.

The minutes of the last meeting having been read and confirmed, the following gentlemen were elected members of the Society:—Messrs. A. Atkins, G. Baxter, C. F. Jarvis, and R. L. Wareham.

A number of exhibits were shown, including prints, &c., from Messrs. Harrison and Reilly, the former of whom showed Scovill's whole-plate camera fitted with the Eastman roller; Mr. Hiffe, a capital washing tray, by Wakefield; and Mr. Reilly, a very useful combined rule, square, and spirit level.

The CHAIRMAN gave a lengthy and interesting account of the Glasgow Convention, and highly praised the arrangements and reception he received during the week he was at Glasgow and Edinburgh, and hoped the members would

combine to give the Convention a hearty welcome to Birmingham next year, and endeavour to make it a genuine success.

The meeting terminated with the announcement of the excursion on August 1 to Chepstow and Tintern Abbey.

DERBY PHOTOGRAPHIC SOCIETY.

THE members of this Society had an excursion to Winfield Manor on Saturday last under the able leadership of Mr. Richard Keene, who read a most interesting and instructive paper, giving the history of the Manor House (see page 493), which is a magnificent old ruin, for which he was accorded a hearty vote of thanks. There was a good number of members present, and about thirty plates were exposed, after which the party adjourned to the farmhouse adjoining and developed a goodly number of plates (of ham and eggs, &c.) and then returned to Derby.

The next excursion will be to Nerbury, on Saturday, August 6.

Correspondence.

THE EURYSCOPE.

To the Editor.

DEAR SIR,—In your last week's issue you published a letter from Messrs. Voigtländer & Son, of Brunswick, addressed to Messrs. Marion & Co., in which the first-mentioned firm charge us with "daring to usurp the word 'EurySCOPE'"—at the same time Messrs. Voigtländer & Son claim the word as their own upon the strength of having employed it since 1877.

We unhesitatingly say the accusation is not merited, since we have no wish to usurp the term, but regard it as one which has been applied to lenses of a particular type for many years past in this country.

Mr. John Browning, the eminent optician of London, informs us he has used the term "EurySCOPE" for the last sixteen (16) years or more.

Mr. J. J. Atkinson, of Liverpool, universally known as an authority upon the history of photographic instruments, says: "I have been familiar with the name 'EurySCOPE' in connection with photographic lenses, other than Voigtländer's, for over twelve (12) years."

The word "EurySCOPE" has been marked upon instruments in our own establishment for many years past.

After reading these facts we think Messrs. Voigtländer & Son will unite with us in regretting the publication of their letter, for it is evidently not Perken, Son, & Rayment who have "dared to usurp the word 'EurySCOPE,'" but Messrs. Voigtländer & Son who have dared to attempt so to do.

In advertising "Optimus" EurySCOPES, none genuine unless bearing registered trade mark, Messrs. Voigtländer & Son state that we desire to deceive the public and mask our design. Our design is to call the attention of the public to the "Optimus" EurySCOPE as distinctive from the EurySCOPE of any other mark, and that there may be no possibility of deception we long ago registered the word "Optimus" in England and abroad.

A controversy arose on Messrs. Voigtländer & Son claiming the parentage of the optical form of this lens, the outcome of which proved that the laurels for the invention rested on other brows. It may be unpleasant, still it is true, that this second claim of Messrs. Voigtländers to the name "EurySCOPE" is equally unwarrantable. We feel confident that you, Sir, took part in the controversy referred to. Though we have not the honour of your intimate acquaintance, may we venture to invite you, the veteran Editor of photographic journalism, and intimately acquainted with the history of construction and of nomenclature of lenses, to give the public the benefit of your knowledge and experience on the subject under discussion? We will thank you to make this reply public by inserting it in your next issue.—We are, yours, &c.,

HATTON GARDEN, London, August 3, 1887. PERKEN, SON, & RAYMENT.

[Owing to our receiving this just before going to press we shall defer any remarks on the subject till next week.—ED.]

WASTE GLASS.

To the Editors.

GENTLEMEN,—You remark in last week's JOURNAL that many photographers must be in the same position as your correspondent "W." with reference to a stock of useless glass. I was in the same position until one day I determined to utilise it. I had it all cleaned—something for the gardener to do on a wet day, and designed places so that the sashes would exactly suit the glass. The consequence is that I have now a conservatory 21×14 feet entirely glazed with 10×12 plates, my hot-house with 8½×6½, and my cucumber and melon frames with half-plates. If, by any chance, a pane gets broken, it can at once be replaced without sending for the nearest glazier, who lives five miles away.

If any of our fraternity, who cannot make the same use of old glass that I have done, are desirous of finding a recipient for it, I should be most happy to pay carriage and increase my number of greenhouses, &c.

Another correspondent complains of scratched lines on his burnished prints. Has he tried using a chain burnisher? After use polish clean with a silk handkerchief.—I am, yours, &c.,

Thurning Rectory, Oundle.

J. CARTER BROWNE, D.D.

THE STEREOSCOPIC COMPANY'S EXHIBITION.

To the Editors.

GENTLEMEN,—I am reported to have said at the meeting of the London and Provincial Photographic Association of the 14th instant, that the Stereoscopic Company had not been authorised to use the name of the Photographers' Benevolent Association in connection with their exhibition.

In justice to the Stereoscopic Company, who have so kindly devoted the proceeds of their exhibition to the Benevolent Association, will you allow me to make a correction in the report. I should have been made to say that the Stereoscopic Company had not been authorised to publish the names of the officers of the Association except as officers of the Association in connection with their exhibition. I may add that this was in answer to a question asked at the meeting.—I am, yours, &c.,
A. MACKIE,
10, Queen's-road, N.W., July 31, 1887.

Exchange Column.

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

Good alpenstock stand, nearly new, for good folding ditto.—Address, C. REYNOLDS, 10, Belt-court, Fleet-street, E.C.

Wanted, posing chair, three or four changes, and accessories, in exchange for back-grounds equal to new.—Address, W. HUDSON, Bordesley, Birmingham.

Wanted, in exchange for a good 12×10 burnisher, new, a cabinet or whole-plate lens for portraits, in good condition.—Address, J. HETHERINGTON, 42, Blyth-terrace, Gateshead.

Will exchange two 15×12 glass baths, two ebonite dippers, and one 10×10 dark slide with two inner frames, for cabinet burnisher.—Address, J. BURNER, 16, Westfield-road, West Croydon, Surrey.

Will exchange French micro-objective or quarter-plate lens and camera, &c., for quarter or half-plate wide-angle rectilinear lens.—Address, JOHNSON, 2, Cumberland-road, Hanwell, London, W.

I will exchange whole-plate camera, by Hare, and other effects, for half-plate outdoor set, studio stand, or posing chair.—Address, MANAGER, Photographic Works Company, Duston-road, Northampton.

I will exchange Marion & Co.'s eight by eight feet interior background for another, equal value, good condition. Photograph sent.—Address, GRIMSHAW, 16, Dale-street, Haslingden, near Manchester.

Will exchange seven divisions of *History of England*, two volumes of *Encyclopædia*, bound, and other books; wanted, half-plate or larger dark slides or lenses.—Address, BARBER, Gibson-street, Oakes, Huddersfield.

A light half-plate folding camera, with rapid symmetrical lens and mechanical arrangement for slow or quick exposures, will be exchanged for a whole-plate or larger lens (with or without mount), landscape preferred.—Address, W. ROGERS, St. Germans, Cornwall.

I will exchange half-plate bellows-body camera, by Fallowfield, fitted with 5×4 portrait lens, a silver Geneva watch, and small timepiece, for a whole-plate tourist camera with three double slides. Cash adjustment, if any.—Address, GODFREY, 114, Wellington-road, South Stockport.

Will exchange four volumes of Blackie's *Popular Encyclopædia* and forty-four parts of *Virtue's Imperial Shakespeare*, also apparatus for taking portraits by night, with mixture for burning in same, for a 12×10 rapid rectilinear lens or background and chairs.—Address, F. C. D. HUBB, Shepton Mallet.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for this omission of their communications.

PHOTOGRAPHS REGISTERED:—

W. H. De Lan, Merpeth.—Group of Princes of Wales, Sir Matthew Whits Ridley, Mr. J. B. Cookson, Captain Terry, and Mr. Dent Dent.

William Henry Leader, 239, West Derby-street, Liverpool.—Photograph of entrance to Newsham, Liverpool.

Williams Brothers, High-street, Rhyl.—Four Groups of the twenty-seven defendants (with their solicitor) charged with rioting.

Thomas Protheroe, 36, Wine-street, Bristol.—Portrait of Rev. F. Freestrait, D.D.

T. A.—The bichloride acts upon the whole of the film, supposing there be any silver in it. You can, of course, see the effect.

J. WHITEFOOT.—An article devoted to the subject will be found in the last edition of *Hardwich's Photographic Chemistry*.

J. ROBERTS.—No. 2 position of studio will enable you to obtain the steadiest light throughout the day; next to that would be No. 3.

A. Z. Y.—Unless you require to take pictures in confined situations, by all means purchase a lens of the rapid type in preference to a wide-angle one.

GREENHORN.—To take hymns for the lantern first make a negative, very intense and of any convenient size, and then from this produce the transparency by wet collodion and the camera.

M. AUTY.—Test the strength of the silver bath and make it stronger if it be required. Judging from the appearance of the prints, one would surmise that the solution was too weak.

F. SMALE.—By shortening the tube and bringing the lenses closer together a larger area of illumination will be obtained, but as the focus will not be shortened to any appreciable extent by this treatment, the dimensions of the image on the ground-glass will be very little reduced.

S. W. wishes to know how he can print from a negative which is cracked, some of the film being also injured. He says that the crack and other injury does not extend beyond the sky.—The best plan will be to stop out the sky entirely with black varnish, so that it prints white; then clouds can be printed in from another negative.

W. HENRY.—The negatives are moderately good as photographs, but you have completely spoiled them in the retouching. If this be a fair example of your skill in retouching you had better confine yourself to operating. If a photographer engages a man as operator and retoucher he naturally expects him to be proficient in both, and you certainly are not.

S. A. WILLIAMS says he has a very badly faded paper print to copy, but the lights are such a strong yellow that he cannot obtain anything like a presentable result. He asks if we can suggest any means by which a fairly good copy can be secured.—If our correspondent will take the negative on an orthochromatic plate, using a yellow screen in front or behind the lens, he will no doubt succeed better, if, indeed, he does not get a very satisfactory result.

S. WATERS wishes to know why some of his unvarnished negatives have a white looking substance upon them at times, and sometimes they are quite moist although they have not been wetted.—Evidently the negatives have been but very slightly washed, hence when the atmosphere is dry the hyposulphite crystallises out, and in damp weather the salt deliquesces on the surface. For this to happen the washing must have been most carelessly performed.

HYPHO says: "The hypo in which I have fixed my dry plates and opal enlargements I have collected and evaporated in a jar in the oven. I have now crystals and a black, muddy sediment; do you think there is any silver in the crystals yet? I should be very thankful if you would be so kind as to advise me what to do."—The best plan will be to redissolve the crystals and then add sulphide of potassium so long as any precipitate is thrown down; the "black, muddy sediment" should be added to the sulphide of silver.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, August 10, 1887, will be on *Varnishes and Varnishing*. Saturday outing, if fine, at Hyde Park Corner, at two o'clock. Mr. Cobb will supply a vehicle.

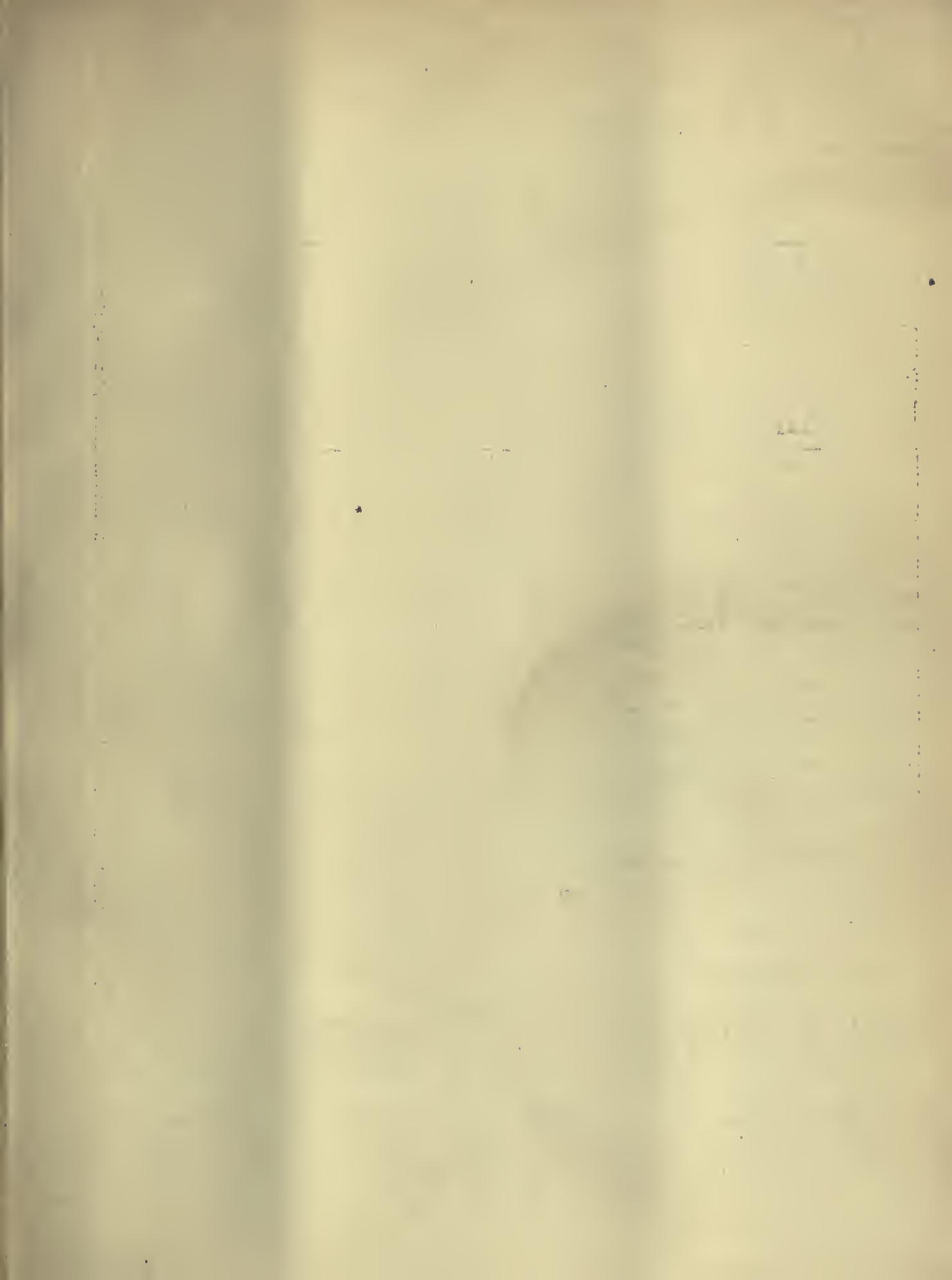
We have received from W. R. Ridgway, Ealing, W., samples of some of the brands of sensitised paper prepared by him. Included in these are plain salted, without being albumenised; together with albumenised, both white and tinted. We found them to print well and yield good tones.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—The next meeting will take place on Tuesday, August 16, and will be a technical meeting. Visitors are invited. Excursions:—August 6, to Hampstead Heath; trains from Broad-street every half hour. August 13, to Wood-street, Walthamstow, for Epping Forest; trains from Liverpool-street every half hour.

HINTS TO AMATEUR PHOTOGRAPHERS.—An important fact to be remembered in making portraits at close quarters is that the professional photographer uses for portraits a special portrait lens, but the amateur generally does this work with a lens made for taking views. These view lenses "condense" very much; that is to say, exaggerate the perspective by taking in so wide a field. Sometimes in taking a simple profile, if the head is placed too near the camera, the visible ear of the sitter, not having a chance to get so far off as the nose—which has, let us say, two and a half inches of an advantage—is given an alarming size. Then in a full-face view the poor nose has the worst of it. On this account a "three-quarter" view is the best for an amateur working with a view camera; though if a fair distance is allowed between the sitter and the lens there need be no difficulty of either sort. Do not hesitate to make experiments. Many of the advances in photography have resulted from the seeming blunders of amateurs. To those who, at college or at home, are engaged in scientific studies the camera will afford a means of interesting experiment. The camera has been one of the greatest teachers of this century. It has, for instance, taught Meissonier, the great French painter, that the horses in his "1807" are not galloping as horses actually do gallop. It has taught the scientist who photographed a flying bullet that the reason the best marksmen cannot hit a suspended egg-shell is that a cushion of compressed air precedes the bullet and pushes the shell out of the way. And in a thousand other ways it has been confirming or upsetting scientific and artistic theories. Let the amateur, therefore, pursue his investigations freely in this field of experiment, and see what discoveries he may make therein.—*St. Nicholas*.

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PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM. HELD AT GLASGOW, JULY 4-9, 1887.
GROUP TAKEN AT TARBERT.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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FRILLING TROUBLES.

DURING the prevalence of such tropical weather as has been experienced this summer, we have had so little complaint of frilling that we are inclined to the belief that a steady improvement in the quality of the plates now purchasable must have been continuously taking place for some time past. Some time ago we entered into an exhaustive investigation of this subject, and conclusively showed that in most instances the cause of frilling was the separation from the glass and the swelling of the gelatine through the unequal osmotic interchange of water and salt—"hypo" or otherwise—during developing and fixing operations. We likewise indicated a series of remedies preventive and curative.

A letter in another portion of our columns gives an example of perhaps the most annoying manner in which the evil manifests itself. Everything is going on well, no change presumably in the manner of working, yet, of a sudden, frills set in and peril the very existence of the negative. It is a very easy matter when a stock of plates is laid in to return every one if it is found out in time that they are unduly liable to the evil, as also it is to take remedial precautions when a slight tendency to frill is known to exist. But when, like a thief in the night, the much-feared rucking up of the edge, followed by an ever-increasing lifting of the film, makes its sudden appearance, when hitherto all had been going on satisfactorily, nothing but the promptest action can save the picture from becoming a complete wreck. This is a state of affairs which most photographers have had an experience of.

Now, although, as we said before, we have shown the cause and the mode of prevention, every photographer has his own plan—which usually is alum, alum, alum—these hardly reach the case with which we are dealing, and we must suggest more heroic measures.

We will follow up a batch of negatives which are being treated, say three dishes being employed. Half of them, let us say, have developed as usual; but the next three as soon as placed in the washing water show frilling, which increases every moment, and, after fixing, the whole film slips away. If a dish of alum is not immediately available, the unfixing negatives in the washing water should at once be placed in the hypo fixing solution (no danger whatever to the integrity of the negative is to be apprehended, even if a plate be taken direct from the developing into the fixing solution), which should be diluted till of a strength of not more than an ounce and a half to the pint. It will rarely, if ever, occur that frilling will increase in the hypo; the opposite action rather would take place. The plates should be left in the hypo for five or ten minutes after apparent fixation, and allowed to drain ten minutes—not for

too long a time, or the image will be reduced. Then the plate, after having as much moisture as possible removed by a piece of blotting-paper, should be gently dabbed with a wet cloth, the moisture reabsorbed with dry paper, and then careful washing may follow.

If a negative have only partially frilled after washing following fixing, and an inch or two of expanded film hang over the edge of the negative, which is absurdly distorted at the parts, it can be completely remedied by placing the plate in a dish of methylated spirit. After the lapse of a very short time the most violently expanded film will be reduced to its original dimensions, and during the process of reduction it should be gently pressed into position by the fingers, all air bubbles being pressed out at the same time. In almost any but portrait negatives it will be impossible after the plate is dry to distinguish the portions that have undergone these metamorphosis in size.

It may happen in very bad cases that, notwithstanding all the above described precautions, the negative will "go" after fixing, and it appears hopeless to do anything with the rest, even with alum solution at hand. There is no need to despair even now. Let the next plates developed be placed, after a short rinsing with water, into alum solution; the worst examples are not likely to frill to any further extent in this solution, the object being to thoroughly wash out the developer as a preliminary to the next treatment. The alum solution may then be washed off as well as possible, and the plates, unfixing, be placed in the rack to dry. At this stage, if the developer have been well washed out, there will be no risk in admitting a little daylight into the room; but if circumstances permit, it is well to keep daylight from the plates for fear lest any of the developer remain in the film, in which case we should expect fogged and over dense negatives.

When even the most errant plates are once well dried after developing and aluming, they may be placed in weak hypo to fix, and be washed afterwards without fear of frilling. But we would interpose the words of warning, "Use fresh hypo." In the hurry and confusion attendant upon the unexpected occurrence of the enemy, at, perhaps, a very busy moment, it may be expected that the alum might not be entirely removed; and if this were so, there would be increased danger of want of permanency, for we must remember that the most potent cause of the ills attendant upon the decomposition following the admixture of alum with hypo is not so much the products of decomposition of the two salts as of the deposition in the film of the silver dissolved in the hypo. It is easy enough to predicate the results of this admixture, but impossible to believe that if silver be present it can be "eliminated." It will

remain in the film in a form potent for evil; hence, the fresher the solution of hypo, the smaller the amount of the silver thrown down.

We do not at the moment of writing remember this method of a preliminary drying of impracticable films having before been recommended, and we can say that, having tried the method in our own practice, we have found it to answer admirably with the most imperfect plates we could discover. We have found a tendency in the method to produce too great density of image, but by following the precautions given this may be avoided. Should it, however, be brought about by any failure of operations, a slight treatment with Mr. Howard Farmer's reducer of ferrieyanide of potassium and hypo will bring it right, and in few cases could the treatment be traced in its effects. We have endeavoured briefly to give instructions as to how to proceed in case of a sudden attack of frilling, and, we trust, with advantage to our readers; but our best wish is that they may never have occasion to put them into operation.

SHOULDER SHOTS WITH THE CAMERA.

For pictures requiring instantaneous exposures camera stands are not necessary.

We have proved in our own experience, over and over again, that sharp images may be obtained when holding the camera up with both hands, relegating one finger to the liberation of the shutter by which the exposure is made. We have proved that for instantaneous work the camera stand is of no more use than would be a support for a fowling piece when being utilised in the field in pursuit of game, or anything else on the wing.

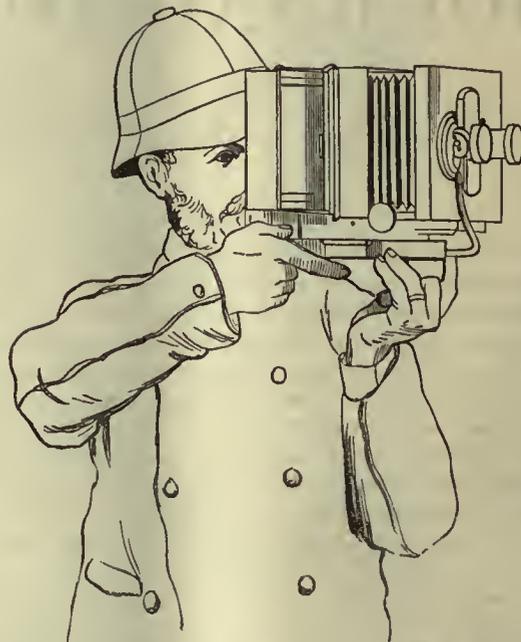
A practical application of this is found in the employment of detective cameras, which, when used as such, are invariably held in the hands. Nor need there be any blurring of the image arising from a jar of the shutter or motion of the camera during the momentary exposure. We find upon examining a number of negatives taken in this way that they will bear enlargement (when printed as transparencies) up to twelve or sixteen feet on the lantern disc without any apparent falling off in definition. This does not apply alone to shots made by a properly constructed detective camera, but to any camera when held by both hands and directed to the object to be taken.

We have long since discarded "finders" in cameras of this class as useless. It is not only possible, but, after a little practice, quite easy so to aim the camera that any desired object shall be precisely in the centre of the plate. Let the camera be held up, as shown in the cut, but with the eye glancing along the upper corner, and upon touching the trigger or pressing the pneumatic ball, the object seen, when looking along the corner, will of a certainty be found in the centre of the plate. Suppose the object to be the not very artistic one of a brick wall, one brick in the centre of which is chalk-marked; if the camera is sighted to that and is pointed with such a moderate degree of accuracy as, were the weapon otherwise, would ensure the bringing down of a partridge on the wing, it may be depended upon that the brick thus marked will be in the centre of the field.

Judgment is required at the critical moment to know just how much of a subject aimed at will be included in the view; judgment also is required to determine the proper allocation of the subject on the plate; but this is arrived at by experience.

Weight is a desirable feature in a small camera when taking

views on the wing without a stand. On one occasion we found, when employing a very light quarter-plate camera for instantaneous shots, that the sharpness was not at all what could be desired, although we knew from former experience that the lens could not be at fault. After cogitating the matter over we arrived at the conclusion that the very lightness of the camera was the factor in this impaired definition. So, strap-



ping a weight of over a pound to the bottom of the camera, further trials were made with complete immunity from the evil.

This arises from presumably the same reason that causes a sportsman to say that he can shoot more steadily and better with a heavy than with a light rifle.

It is good initiatory practice in this direction to select a scene in which the horizon is as nearly level as possible, and make a few shots with the special aim of reproducing this horizon line not only straight across the plate, but either a little above or a little below the centre of the plate, at will.

This having been achieved, the next thing ought to be to raise the camera from the side (we assume that it is being carried in the right hand all ready for whatever happens to turn up), and having sighted the object to be taken, effect the exposure and have the camera brought down to its former position in a period of two or, at most, three seconds. When one can do this then may he consider himself qualified for taking snap shots without reasonable fear of attention being directed to his ongoings.

PERMANENT SILVER PRINTS.

ONCE more the subject of the permanency of prints in silver is on the tapis, taking the form on this occasion of a question as to the morality of describing a developed gelatino-silver print as "permanent." In the discussion that arose a few months back on the same subject it was pretty generally agreed that the term "permanent" as applied to photographs, or even to engravings, is but a relative one, and that if *absolute* permanency be the requirement no known process fulfils it.

There are, of course, varying degrees of permanency to be met with in connection with different photographic printing

processes, and even with different examples of one and the same process. For instance, some silver prints fade in a very short time, while others are in existence that have withstood the test of thirty years or more. Similarly with carbon and platinotype prints, though supposed to be absolutely permanent so far as the composition of the image is concerned, we are well aware that they not unfrequently suffer deterioration and discolouration. The question of relative permanency must then be considered in direct conjunction with the degree of care exercised in the production of the proof by whatever process it may be executed, and not decided merely by the material forming the image. In this matter developed gelatino-bromide prints in no wise differ from others, and may be supposed to offer chances of permanency in direct relation to the amount of care bestowed upon their production.

How far such prints can be compared with those by other methods is a different question altogether. Clearly, other things being equal, they must be considered inferior to carbon and platinotype, if only on account of the greater indestructibility of the materials forming the image in these two processes. Then, if they are compared with other kinds of prints in which silver forms the basis of the image, a new set of conditions enter into the consideration, namely, the nature of the vehicle or material holding or binding the image together, as well as the condition in which the finely divided metal is found in the picture. The principal media we have to deal with are albumen, gelatine, starch, and collodion, of which the first-named has undoubtedly the worst character, while gelatine perhaps comes next. Then, as regards the composition of the image, we have to discriminate between the metallic deposit formed by the reduction of the sensitive material by means of development and the semi-organic compound formed by the direct action of light upon complex organic salts of silver. Further, we must calculate how far the components of the image are likely to react upon one another under favourable conditions to produce change.

The developed image has long been known to possess comparatively greater stability than that formed by direct printing, and very early examples of calotype and other developed silver pictures are still in existence to show how far the claim of relative permanency is justified. But of course the vehicle holding the metallic deposit must be considered to have some influence on the result. For instance, a plain paper print—that is, one in which the image is formed in and held together by the sizing of the paper—is usually found to withstand the vicissitudes of age and climate far better than one in which the particles of silver are embedded in a layer of treacherous albumen.

Considerable danger is supposed to lurk about a film of gelatine, in consequence of the tenacity with which it is said to cling to silver and other salts with which it comes in contact; hence, in the case of gelatino-bromide or chloride proofs, the necessity for a very great amount of care in manipulation. Hence, also, we may assume that the danger is less in proportion as the quantity of gelatine is reduced; for plainly an extremely thin layer of gelatine, amounting only to another sizing of the paper, will retain less soluble matter than a thick coating which forms a gloss upon the surface. It may be noted that the prints alluded to as having been wrongly described as “permanent” are of the former class—developed prints, with a perfectly matt surface—and may, therefore, if carefully executed, claim as fair a share of permanency as any proof in silver.

We had a few days ago a remarkable instance of the comparative superiority of “plain paper” prints, both direct and developed, over albumenised paper. A box containing prints of the three kinds, more than twenty, perhaps five-and-twenty years old, was turned out of a damp outhouse, where it had been stored with other lumber for at least several years. The contents, printed matter and photographs alike, were damp, mildewed, and rotten, so far as the paper was concerned. The albumenised prints had faded into almost invisibility, but the others showed little deterioration of the image, except where actual mechanical destruction had occurred, and in some few of the better protected cases the picture might almost be said to be uninjured. These prints were made, we were informed, by floating plain paper upon a seven-and-a-half-grain solution of salted gelatine, drying, ironing, and subsequently sensitising by floating on a sixty-grain silver bath. Some were developed, others “printed out,” but at this distance of time it was impossible to distinguish between them, otherwise it would have been interesting to note which had stood the undoubtedly severe test best. At any rate it seems a fair proof that gelatino-silver proofs need not despair of being considered fairly permanent.

AMONGST the Jubilee presents to Her Majesty was a very interesting one from those employed at the Ordnance Survey Office, Southampton. It is a book illustrative of the history of the Ordnance Survey from its commencement down to the present time. It contains drawings, photographs, and engravings, explanatory of the different work carried on by the department. Photography, photo-mechanical processes, and electricity play a very important part at the Southampton establishment. We may mention that even the plates, with the design for the covers of the book, were produced by the joint agency of photography and electricity—the Waterhouse process being the one employed. The present Ordnance Survey Department was formed, we believe, fifty years ago at the Tower of London. Hence it has now arrived at its jubilee. At the time it was started it was a very insignificant affair, as may well be imagined from its location. Now it is a very important institution, and some idea of its magnitude may be formed when we mention that the number of hands engaged at the Southampton establishment alone is between eight and nine hundred.

THE Photographic Club outing on Saturday last was a somewhat novel one. The place of meeting was Hyde Park Corner, and from thence the party journeyed eastwards in a commodious vehicle provided by one of the members (Mr. Cobb), taking flying shots *en route*. The idea was a good one, and is well worth repeating by other societies or clubs who make a feature of Saturday afternoon outings. Some of the most successful instantaneous street views of London have been taken from vehicles; indeed, this is about the only means by which they can be satisfactorily obtained in the busy thoroughfares so that the pictures convey a correct idea of the scene.

AN important case under the Copyright Act of 1866, which has been pending for some time, was decided, on appeal, one day last week. It appears that the plaintiffs, Messrs. Tuck & Sons, employed the defendants, printers in Berlin, to produce a certain number of copies of a drawing. This they did, and also made some more copies on their own account, some of which were imported into this country. The plaintiffs afterwards registered the copyright, yet after this registration the defendant sold copies in England. An action was then commenced by the plaintiffs for penalties under Section 6, and for damages under Section 11. At the trial the jury assessed the penalties at £175, and the damages at £100. The judge, however, ruled that the case did not come within Section 6 of the Act, and therefore gave judgment for £100 only. Upon this the defendants applied to the Divisional Court to enter judgment for them on the claim for damages or for a new trial, on the ground that the damages were excessive; there was also a cross motion for the penalties.

The Divisional Court gave judgment for the defendants on both claims. The case was then brought into the Court of Appeal, where it was decided, by a majority of the judges, in favour of the plaintiff on the question of damages to the extent of £30 only, and that the defendants were not liable for the penalties. The Court, however, granted an injunction restraining the defendants from selling any further copies. From beginning to end this has been an expensive litigation, and it is to be hoped that, when a new Copyright Act is passed, it will be sufficiently clear and explicit so that costly proceedings similar to the above will be avoided.

REMARKS by no means complimentary to the proprietary of the Deal Pier, and their ten shilling toll to photographers, were passed at the Photographic Club last week. We learn that the Pier is not the property of the Town Council but that of a private firm, and that financially it is not a great success. If no notice appears at the entrance to the effect that photographing from the Pier is prohibited unless the ten shilling impost is paid, any one who happens to be unaware of the regulation and exposes some plates can only be requested to desist. Any demand that he should destroy the plates already exposed would be simply nonsense. If any force were employed to compel him to do so, as is alleged to have been done, it would amount to an assault and be punishable as such by the magistrates.

GELATINE as a mountant meets with but little favour amongst photographers, yet, in some respects, it is one of the best materials that can be employed, inasmuch as it acts, to a certain extent, as an insulator from the mount. If that happens to contain any matter which acts injuriously on the print, a layer of gelatine interposing will afford it some little protection. Many photographers who have tried gelatine have met with difficulty in its employment, chiefly arising from the solution setting before the print can be adjusted in its proper position on the mount, hence they have abandoned its use. The mistake in their case has been in the employment of a gelatine of too high a quality, or, perhaps, using the solution too strong. It is next to impossible to mount prints successfully with some of the better kinds of gelatine—those used for dry plates, for example. The kinds best adapted for mounting purposes are those of the poorest quality—as a gelatine—that can be obtained, provided they are pure. One of the best kinds we have used for mounting pictures is Nelson's "No. 2 Soluble." It possesses the quality of setting slowly, is free from acidity, and it contains nothing which is likely to act injuriously on a photograph. It also has great adhesive properties, therefore the solution may be used very dilute—a great convenience. This brand of gelatine is also well adapted, which the higher qualities are not, for making a mountant, in which a large proportion of the water is replaced by alcohol, such as those used to avoid cockling of the mounts.

SOME professional mounters employ glue for mounting photographs, and select those even of the commoner qualities in preference to the better, simply because the solution does not gelatinise so quickly. Glues are all more or less impure from a photographer's point of view, and are, moreover, usually acid. The commoner the quality the greater, generally, is the impurity, hence for mounting silver prints any kind of common glue should be avoided.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

If carefully considered, there will be found to exist a very close resemblance between pure art, if I may so put it, and the photographic art. In the composing, lighting, and general arrangement of the accessories, the same rules should guide us in both cases. The same feeling should inspire the operator in his studio that inspires the artist at his easel.

In all pictures there should be at least one leading or principal light, a point of attraction which will at once catch the eye and to which all others should be subordinate. In portraiture this point of attraction should naturally be the face, as upon it depends the value and interest of the whole picture. Every thing should be subservient to the face, and any obtrusive accessory, or offensively apparent dash of colour

* Continued from page 454.

which may in the least distract the eye from it, may honestly and surely be put down as a fault. Of course I do not mean to say by this that the face must be the *only* point of light and attraction. On the contrary, lights may be repeated in different forms and carried throughout the picture, but in a more subdued degree. They will thus be an aid to the general effect of the picture, giving it life and airiness, whereas without them it might have appeared heavy and dull. Indeed, many a time it will be found not only advisable but even necessary to relieve a large or heavy mass of deep shade by the infusion of a little light; here the artist has another marked advantage over the photographer. The latter is obliged to gain this result by letting in *real* light, be it direct or reflected, and this must in many cases naturally interfere with the rest of his picture. In a picture where a number of accessories are being used, the photographer may certainly so place a certain coloured article that will either naturally catch the light more than the surrounding objects, or whose actinic qualities may produce a different degree of intensity. But, as I say, all this has its various disadvantages. The painter, however, by a judicious blending of colour, will secure the desired effect and still not alter in the least the general tone of his shadow. It is always a serious consideration to keep the deepest masses of shadow from being too heavy, and yet they must be preserved sufficiently dominant so as to impart balance and solidity to the picture.

In arranging a portrait (more especially when three-quarter or full length) care should be taken that the masses of shadow—those portions giving the idea of weight—should be kept at the base or lower portion of the picture. This refers alike to colour as to form. Take for example the production of a portrait of a gentleman, say either three-quarter or full length, and paint or photograph him against a plain background that will present an equal tone all over, the result will be perfectly absurd. An uncultured eye may look at it, say there is something wrong, unpleasant, about it, and still not really detect where the real trouble lies. Well, with such a portrait, let us see what we can do to better it. We know that the standing figure of a man unsupported by accessories must always appear uncomfortable, as the man would in all probability himself feel while giving a *sitting*. This is one of the extraordinary advantages of art, both pure and photographic; a subject can give a *sitting*, *standing*, and may be not untruthfully said to *sit* while he *stands*.

Being convinced, therefore, that a figure so placed is at a very great disadvantage, our task must be to so alter it that it may be satisfactory in all respects. What is required is breadth of base, and this may be secured by the judicious introduction of accessories, or even (in photography) by the placing of a walking-stick or umbrella so as to give the idea of support to the body, which would naturally produce the effect of broadness of base. In the case of the artist this means can not only be adopted with like success, but he can, by the simple arrangement of his darker masses of shadows, so that they naturally find themselves at the bottom or base of his picture, secure that equilibrium or balance which is so indispensable to success.

It must ever be borne in mind that these and all similar effects should be devised and produced in such a manner as not to unduly attract the eye. They must appear natural, not artificial, and must not easily expose the intention of the artist, as, failing this, the advantages gained will be very seriously discounted.

To the beginner or amateur who determines to acquire at least the primary rules for the artistic composition of portraiture, whether in the photographic studio or on the canvas, the *pyramidal* form seems to be the favourite. They think it the easiest, as it is perhaps the least complicated. I have nothing whatever to say against its adoption, but I wish to draw attention to the fact that it requires a great deal of sound artistic skill to treat it successfully. The trouble here is to secure the effect without letting the means by which we gained it become too observable. Now, this at first sight may appear very easy, but, believe me, it is not so, and will give the beginner a deal of worry before he thoroughly masters it. One wants a very keen artistic appreciation to successfully produce this form of composition. Too much attention cannot be given to the study of the various forms of compositions, as at times the numbers and the disproportionate subjects which will come to a studio to be grouped would almost defy a Sir Frederick Leighton himself to realise grace of composition in making a picture of them. I think

the truth of this will be evident to any operator of a few years' experience in the studio.

Contrast is a most important element in every form of pictorial effect—contrast as regards drawing or lines, and contrast as regards tones—both colour and light and shade. The value and grace, for example, of curved lines can not only be made apparent, but absolutely shown to greater advantage, by having straight lines judiciously placed for the purpose. They might be considered somewhat complementary to each other, the straight lines showing off the beauty and grace of the curved ones, while the latter, whatever their good intentions may be, succeed only in showing that their neighbours are *straight*.

Relief, vigour, brilliancy, and general harmony are the results of the artistic contrast and varieties of tones. These contrasts should never be harsh or abrupt. We must not run away with the idea that contrast means in all cases *pictorial effect*. This is not so. On the contrary, it may be even the ruin of a picture. The bringing together of a mass of black and a mass of white, without any attempt at gradation of any kind, will undoubtedly produce *contrast*, but it will be entirely devoid of pictorial effect. One of the most essential qualities in a picture of merit is *breadth*, and this can never be obtained where harsh and crude contrasts are to be found. In the arrangements, therefore, of draperies and other accessories, it should be our constant care to avoid placing such colours (if I may be permitted to call them such for the moment) as black and white in anything like juxtaposition. Both may be necessary and even advantageous to a picture, but their approach towards each other should be marked by such gradations as will thoroughly dispel any feeling of harshness or crudeness which, without same, would be sure to exist.

There is nothing so conducive to the securing of harmonious contrast of tones as the judicious and artistic lighting of the model. Carefully avoid throwing a direct front light upon it, for by such a lighting you would inevitably deprive it of all relief. Generally speaking it is advantageous (unless some out-of-the-way effect is desired) to let the light fall upon the model at an angle of 45°; direct *vertical* light should be avoided, but the freest use may be made of the *side* light. Note should be made that force is obtained by a direct light, while softness and delicacy can only be produced by diffused light. It is not advisable to adopt either as a sole means for producing a picture, but rather by a judicious combination of the two. Form and strength of outline may be secured by the direct light, to which the diffused light will then impart softness and texture. Too much diffused light must not be employed, however, or else the shadows will be weakened, and, as a natural result, a general flatness and tameness will be imparted to the pictures. Indeed, to secure force and vigour in a picture, it is absolutely necessary to combine the two, namely, the direct and the diffused lights.

In half and three-quarter length pictures, many prefer plain backgrounds, that is, without accessory, but so tinted as to produce a deeper shadow at the base than at the top. Without this there would be no balance. Now, although these pictures may be very pleasing indeed, it does not at all follow that a full-length portrait would be the same. No, the full length really wants a help in the way of accessories, &c. In arranging these accessories, therefore, I beg to draw attention to the necessity of their being in harmony with each other and with surrounding objects, as well as with the character of the sitter.

In a lifetime I have seen some strange combinations in this regard. Some, you would say, are absurd, nay, impossible; nevertheless they are there. It was nothing very uncommon some time ago to see in a picture an article of furniture to be usually found in the drawing room apparently located on the seashore. I have often seen a curtain to an open background or seascape. I have seen a lady in evening dress against some snow-capped mountains. Of course all this is bad enough, and now but seldom occurs. There is another stupid but less observable blunder often committed by the thoughtless operator. I now refer to the introduction of such accessories as balustrades, &c., showing a distinct effect of light upon their surface. These oftentimes are placed behind a sitter, and the sitter then lighted from the other side. This naturally spoils the picture, and, I am glad to say, very seldom occurs nowadays, but sometimes it crops up even in otherwise good photographs.

It is advisable to have as great a variety of accessories as possible, both as regards form and colour, for it is only thus that the operator can cope with the exigencies of composition when he has ungainly subjects to deal with. Care should be taken in the use of painted backgrounds to see that the light and shade will correspond with that of the model. There should be no very distinct form visible in backgrounds, as they may often come against a head in a most objectionable position. There should be no distinct pattern on the carpet which would form a series of perspective lines, and it should be dark in tone. I think now we have run through all the preliminary matters which may help us in the colouring, and can now safely make a start in that direction.

A photograph, however good, is still cold and lifeless, but the skilful application of colour gives life and animation to it. It gives an idea of the man's character, his occupation, and oftentimes his mind.

REDMOND BARRETT.

(To be continued.)

THE ACTINOMETER IN LANDSCAPE WORK.

Is the actinometer, as usually constructed, of any practical value to the outdoor photographer? Every now and then we see in the journals a revival of its proposed use, but never so far as I can see are any new arguments brought forward in its favour, but rather the proposals seem to emanate from beginners to whom the idea is new, and who have not devoted a sufficient amount of thought to the subject.

I have confined myself for the purposes of this article to the question of the utility of the actinometer in relation to landscape work only, but I may remark, in passing, that as a scientific instrument it is doubtful whether its value is assured in any capacity connected with photography. I will take its original and perhaps most really useful application, namely, to the timing of the exposures in carbon printing and similar processes, the progress of the formation of the image in which cannot be followed by the eye. Here we have both sensitive surface and actinometer exposed simultaneously to the same direct light, and consequently each receives precisely the same quantity and undergoes the same amount of alteration.

But, on the other hand, there is a wide margin of uncertainty; in the first place, in estimating the tints, whether one or several, everything is left to the judgment of the observer or rather to the capacity of his eye to discriminate nicely in comparing the tint produced with the standard. In the case of those instruments where the exposure is measured by the printing of a certain number of successive tints of no great depth, while it is perhaps easier to secure a tolerably accurate comparison in the case of each individual tint with the standard, still the number of times the operation has to be repeated multiplies the chance of error as well as the actual error if there be any. Where the paper is permitted to darken until it matches a tint upon a graduated scale as in the Woodbury photometer, though there is only one exposure and only one exercise of the judgment, it will be found that not only is it more difficult to compare the darker tints but a very considerable variation may be made in the length of two successive exposures and it shall be difficult to say which tint more closely matches the standard. These difficulties are only increased when, as is the case nine times out of ten, the colour of the standard differs from that given by the sensitive paper employed.

Another trouble, and one which would prove insurmountable were it not for the well-known quality of "latitude" existing in the development of all photographic images, is found in the difference of the light's action upon the two surfaces as the circumstances vary. If the sensitive surface to be timed and the sensitive material employed in the photometer vary in composition, we can hardly regard the one as an accurate measure for the other; by accident, under certain conditions, ordinary silver paper may form an approximate guide for the exposure of carbon tissue, but we cannot expect, nor in practice do we find, the same degree of approximation under every condition of light. In point of fact, though silvered paper in a good summer light may colour almost, if not quite, as rapidly as carbon tissue, the latter in winter is far the more rapid, and therefore the number of tints that suffice in summer would be entirely misleading

in winter; and if this disagreement occur with the seasons why not with the hour of the day? With collodio-chloride, gelatino-chloride, or platinotype, the same objection holds good; the different surfaces do not possess the same colouring power under varying conditions as the silvered paper usually employed in the actinometer. Therefore I hold that even under the most favourable conditions, that is, in direct printing, the photometer is but an approximate guide.

But what shall we say of it when the circumstances are wholly changed and the measuring instrument is exposed to direct light, while the image is formed upon the sensitive plate in the camera by the rays of the same light reflected from an innumerable variety of surfaces? If we try to improve matters by exposing the actinometer to reflected instead of to direct rays, which shall we select? The shadows, the lights, or the *tout ensemble* of the landscape? And how are we to do it? Then, again, we shall have not only to replace the slowly colouring albumen paper by something more nearly approaching the sensitiveness of the dry plate, but, further than that, substitute development for direct printing if we want to get any degree of accuracy. In fact, in order to meet the requirements of the case, we want a sort of camera that will condense the light reflected from any particular portion of the object, and throwing it on to a sensitive surface similar to, if not identical with, the plate to be employed, enable the operator with the aid of a more or less arbitrary method of measurement, by graduated screen or otherwise, to estimate the exposure necessary for *that portion only* of the subject tested. But what about the rest of the picture?

The fact seems to be that the supporters of the actinometer entirely overlook several things, and can only bring one or two items of evidence to support them. The actinometer gives you, they say, an idea of the value of the light at the time, which, of course, must be an advantage. Perhaps so, if the experience of the operator be insufficient to give him an idea that is at least as free from liability to error as the subsequent operations with the actinometer. But with that estimate of the power of the light the functions of the instrument cease; everything else is really as much left to the judgment of the photographer himself as if the actinometer had been left at home. "But," say they, "the proof of the pudding is in the eating," we can accurately time our pictures by means of the actinometer."

Perhaps they can; but perhaps they would do it just as well without. There is no necessity to blame the actinometer for the result. Perhaps the latitude of exposure of dry plates, perhaps the great latitude in development of the same, may have something to do with it; and perhaps the extra care in manipulation generally, born of the knowledge that they have a "fad" to prove, may have as much to do with it as all the rest put together.

If the exposure of a gelatino-bromide plate had to be made within a small margin of absolute accuracy in order to obtain a result, and development consisted in merely immersing it for a certain time in what is called a "normal" solution without any modification whatever, I should like to see the gentleman with the actinometer at work. They would, I fancy, very soon find that unless they exercised their judgment in the matter of exposure the trusted instrument could tell them nothing. If all subjects were alike, and all "open landscapes with foliage" required precisely the same exposure, there might be a possibility of utilising the actinometer in a scientific manner. But until outdoor practice is reduced to the level of reproducing what somebody described recently as "black letters on a white ground," I expect these gentlemen will have to go on "guessing," or, in other words, trusting—unconsciously, perhaps—to the wonderful amount of "rope" they have both in exposure and development.

I do not for a moment wish to dispute the value of even the simplest forms of actinometer—the simplest are as a rule the most accurate—for their proper purposes, the direct measurement of light. But they certainly do not meet the requirements of the landscape photographer, whose trouble lies rather in estimating the value of his subject and compromising the difficulties raised by its component parts than in ascertaining the precise strength of the light at the time of exposure. Variations of light occurring from day to day or from hour to hour are not in the least likely to operate disastrously even in the case of an operator tolerably careless in the matter of exposure, because they are more than swamped by the elastic nature of the sensitive plates and their treatment; but he who neglects to study

his subject and to see how he can best reconcile its antagonistic requirements is sure to come to grief. For his purpose the actinometer is of no more use than the tables of exposures published in our annuals and text-books; both the one and the other require using with brains.

Far better than any actinometer I consider the old dodge of carrying a couple of small pieces of coloured glass in the pocket, through which to view the landscape before exposing. Contrasts that do not strike the unaided eye unless trained to the purpose are brought out when the scene is scanned with, as it were, an artificial eye. Yellow glass brings into prominence the shadows of the picture, while blue emphasises the lights. This plan was never put forward as a scientific one nor as a method of accuracy; but used "with judgment" it is an aid to the practical worker which the actinometer can scarcely be.

ERNEST GRAHAM.

ECHOES FROM THE SOCIETIES.

MR. NEWTON is credited with a rather extraordinary statement, or so it seems to me, in the report of a meeting of the Society of Amateur Photographers of New York. I have always been under the impression that silver bromide was far more sensitive, relatively, to yellow light than the chloride, and that the latter was comparatively insensitive to yellow. But, according to Mr. Newton, "You take an orange coloured light, and it will act upon the chloride of silver about as quick as a white light. That is, any professional photographer who is printing on a day when the sky is clear and has a yellow light, will print his prints as quick as he would if it was a white light, and the action of that light on the bromide of silver would require at least double the time."

The idea that chloride of silver paper will print as quickly in an orange as in a white light is quite new to me, and I should be glad and not surprised to find that Mr. Newton is misreported. I think such must be the case, for he goes on to mix matters by saying that "when it begins to be late in the day . . . it is not a very difficult thing to take an instantaneous picture, but it will take a pretty long time to make a print on a piece of chloride of silver paper." Verily there is room for some explanation.

Then, again, it is curious to hear that Mr. Newton's rule is "to over expose always," though certainly the statement is qualified by the addendum, "that is, for a normal developer." But that can surely not be over exposure if a modification of the developer will make a negative. On the principle that "you cannot have too much of a good thing," an exposure cannot be too long if it effects its purpose satisfactorily. But here again Mr. Newton is somewhat indefinite, for he says, a little later, "I always have it a sure thing if I have got the right exposure." So I suppose the *right* exposure is *over exposure*.

At the same meeting Mr. Spaulding summed up the disputed question of the efficacy of the actinometer when employed with different lights in a very neat manner. He says in effect, "Suppose I have two weights of 300 pounds and 3000 pounds respectively to move across this room, and it takes me five minutes to move the lesser, how long will it take me to move the greater?" "Why, I could not move it at all," he replies, and goes on to point out that the comparison of a sunlight exposure upon chloride paper with an exposure to gaslight is just about as reasonable. I heard the very same idea expressed in a different manner some time ago. If two minutes' immersion in boiling water will coagulate the white of an egg, how long should it be immersed in water at 120°?—Fahrenheit, of course. The reply to this conundrum was, "As long as it would take to make an albumen print from a negative of ordinary density by gaslight."

The champions of the actinometer were hard to kill, for even after being told that the principle had been proved to be useless as well as "unscientific," one of them wished to know if there was anything scientific in the whole range of photography? This was rather hard on photography, but still harder, I think, the reply that "there is a good deal in photography that is scientific, but it has never been found out." Oh, ye scientific (?) writers! I thanked my stars last week that I did not belong to you, how much more so now!

But I think Mr. Ripley, who made the statement, must have meant to say that *he* had not "found it out." Whether he meant to say so

or not, he proved it, otherwise he would not have said that no two of the "best chemists of the world" would give "the same reason for the same result." Nor would he have expressed much doubt as to the reason why "collodion sensitised (*sic*) to-day" would give a different result in a month's time. In saying that that is "something nobody can tell" he is, however, perhaps speaking of himself again. "There is lots of science, but *we* don't understand it." Why not place himself under somebody who does, and go to the next meeting prepared?

The President was a trifle disingenuous in the way he fenced the question—"dodged" was the term applied by one of the members—as to whether anything could be done in development to make up for under exposure. The "gentleman in this room"—himself I presume—who maintained that "an under-exposed plate can be made as good as a plate that has been over exposed" neither answered the question nor spoke correctly. Excessive exposure can be held in check; absence of exposure cannot possibly be supplied chemically. A *slightly* under-exposed plate may be made passable, but never equal to a fully exposed one. A slightly (or very greatly for that matter) over-exposed plate may make a perfect negative. I use the term "over exposed" in relation to some definite form of development; within pretty wide bounds I don't believe in such a thing as over exposure if the development be made to suit. But under exposure places the plate beyond the reach of *any* form of development.

In answer to a question at the same meeting it was stated that Mr. Roche, of New York, had discovered a method which enabled him, after exposing a plate in the camera, to render it insensitive to any further impact of light without in any way injuring the image already formed or interfering with its subsequent development. This, if true, opens up quite a new vista in landscape work, and will deal a heavy blow at changing boxes and double slides. It recalls to my mind a Utopian dream of my very early photographic days, in which I imagined the possibility of taking out prepared plates in the insensitive state which, after placing in position in the camera, were to be sensitised by the injection of a puff of vapour of some sort, and after exposure desensitised in a similar manner. A single dark slide and an ordinary deal plate box, instead of the costly dark slides and changing boxes, formed no unimportant items in that early dream.

It seems that there is yet another French claimant for early photographic honours. M. Bayard is stated to have printed the first paper proof—a claim which I fancy will require verification. The process described is certainly a very old one, but I never remember to have previously seen it accredited to M. Bayard. I tried to work it with but scant success upwards of a quarter of a century ago, having come across it in some old receipt book.

I can comprehend the meaning of the pictures on "the 'Siamoise' plan" forming part of the late M. Bayard's exhibit before the French Photographic Society; they are, I presume, similar to those formerly called "binographs," or some such name, in this country. But I really cannot divine, in either English or French, what is meant by a person "fencing with his *sosie*." It would be better to describe such things in plain English I think.

In the report of another meeting of the same Society we are told of some new lenses that are said to be "joined together" with "*Canadian balm*." In English there exists no such substance, though that may be its French designation; but if it were necessary to mention the cementing medium at all it would have been preferable to describe it in an English journal under its English name, Canada balsam.

The keeping qualities of plates cropped up again for discussion at the Sheffield Society, and the opinion was expressed that a bromide plate would keep indefinitely if protected from damp and air. This I consider to be true and yet untrue, to assert too much and yet not to claim sufficient. A very important item is left out of the calculation, namely, the condition of the film to start with. If the emulsion has not been thoroughly washed to free it from soluble salts, or if it has contained at any period of its existence free silver, or supposing it to have been properly washed but not perfectly dried at first, it is hopeless to expect the plates to keep, however well packed and kept. A well-washed emulsion and well-dried film will, I believe, keep indefinitely if kept with only ordinary care; nay, more than

that, a well-washed pure bromide emulsion plate will suffer little even from the effects of subsequent damp, unless it be sufficiently aereve and prolonged to result in the actual decomposition of the gelatine. Colonel Stuart Wortley has narrated in the account of his trip round the world how his plates—at least, those of certain brands—passed scatheless through the trying ordeal of three weeks of extremely rough and wet weather, when everything was in a state of incipient or well-developed mildew; and this, too, with salt water.

I had myself last winter a very remarkable example of the hardness of really good plates—good that is in the sense of the emulsion having been free from soluble matter, and of their superiority over others apparently equally good when put to the test. During one of the frosts a pipe burst in my dark room and a cupboard containing several different samples of plates was badly flooded, and, to make matters worse, the damage to the plates was not discovered for a considerable time; until, in fact, the plates had dried and become glued into solid blocks, some of them with paper between the films, others separated at the edges only. As a matter of curiosity, I took the trouble to separate some of the plates for the sake of testing them, and I must say I was surprised to find that two brands passed perfectly through the trial, being, with the exception of mechanical markings from the paper having been pressed into the soft films, as good as if the damp had never reached them. Other makes were, however, hopelessly ruined—I was going to say mentally and bodily—but what is equivalent, photographically and mechanically.

It is perhaps not strictly accurate to lay such a result at the door of the manufacturer's carelessness only, for the composition of the film may have something to do with the matter. Thus, a plate containing chloride of silver is far more liable to deterioration from atmospheric influences or damp than one consisting wholly of bromide, even though it may have been perfectly freed from soluble salts. An ammonia-made plate will also, *ceteris paribus*, usually prove inferior in this respect to one made by the boiling or digesting processes; unless, indeed, the decomposed gelatine has been removed by the "separator" or by one of the precipitation processes.

Iodide of silver, too, has been alleged to exercise a deleterious influence on the keeping qualities of a film, but I cannot say that I have ever been able myself to verify the charge. Indeed, one of the two brands of plates I have just mentioned as successfully resisting damp contains, I know, a large proportion of iodide. Still, I think there can, at any rate, be little doubt that plates whose films consist of pure silver bromide and dry gelatine only, may be considered to be permanent as the glass they are on, if properly kept. MONITOR.

STEREOSCOPIC PHOTOGRAPHY.

SOME of my friends say I am mad on stereoscopic work just now; well, perhaps that is *so*. Why did I ever give it up? Why did everybody else give it up about the same time? I can only give some account for *myself*—others must answer for *themselves*.

When I worked a stereoscopic camera many years ago (say twenty years ago), my instrument was not a *double distilled patent*, and in these days it would be considered a heavy and clumsy affair. Well, I admit it was heavy compared with cameras nowadays.

The size was $7\frac{1}{2} \times 4\frac{1}{2}$. I could use it for single views as well as for stereo work. But I became a great enthusiast in lantern matters, and wanted lantern slide negatives. It is true I could take two distinct pictures on each half of my $7\frac{1}{2} \times 4\frac{1}{2}$ plate—each picture then $4\frac{1}{2} \times 3\frac{3}{4}$; but having no opportunity to print by the camera, which required daylight, I could not very well reduce from the half of my plate to $2\frac{3}{4}$ or $2\frac{1}{2}$ picture on a $3\frac{1}{4}$ square glass, I was obliged to print by contact in the evening, therefore only a portion of my negative was utilised, and often the composition of the picture suffered in consequence. It may be said lines could have been drawn on the ground-glass (focussing screen), showing the size of the lantern picture, and the elements of the picture composed within those lines. Yes, I admit that sounds very well; but when we are out in the field we are very apt to compose the picture to fill the focussing glass, and the plate being larger, the camera and other apparatus bigger and heavier, &c., than then required, I parted with the whole kit, and went in for what I thought a more convenient arrangement for lantern work, namely, a quarter-plate camera, the best I could buy, and with that little camera I have taken hundreds of negatives, and it has travelled with me over thousands of miles.

To turn back to my old $7\frac{1}{2} \times 4\frac{1}{2}$ camera and its days, I should say that at that time we had to make our own dry plates, and for various reasons it was then considered necessary to take the negatives on a larger plate than the size of print required, thus giving some margin for defects from various causes. But this does not apply to-day. Gelatino-bromide plates and other advances do not render it important to have so much margin; in fact, a careful manipulator can now make sure of his negative being perfect to the edges.

After reading the Editor's chapters on *Stereoscopic Photography* in this year's ALMANAC—which I did with considerable interest—I turned to some of my old stereoscopic prints and transparencies a night or two afterwards, and whilst these pictures were still about some friends called to see me. They had not seen through a stereoscope for years, but, oh! how they did admire my pictures, and how pleased I was.

I routed up some old stereo negatives made on collodio-albumen and wet plates, and printed a few transparencies from these on gelatino-bromide plates, and what beautiful results I got! These transparencies would not do for the lantern at all; in fact, I will go so far as to say gelatino-bromide plates of *anybody's make* (commercial ones) are unsuited for making lantern slides; they are not clear enough or transparent enough without being hard, and if you do make them soft, they are veiled and flat, and therefore unsuited to the lantern. But this does not apply to the stereoscope. Some of the very finest stereoscopic transparencies are those fully exposed, even amounting to flatness (viewed as a monocular picture); and a little veiling in the sky and high lights, &c., is a decided improvement in many cases; or, in other words, were we to print a slide right for the lantern it would look hard and chalky—snowy—in the stereoscope. Then I say gelatino-bromide plates are more suitable for printing stereoscopic than lantern slides.

The question of going into stereoscopic work again had been occupying my mind some time before Mr. Pollitt and Mr. Abel Heywood, jun., came forward with communications on this subject one evening a few months ago at the Manchester Photographic Society. I took in all these gentlemen said, and examined their beautiful specimens, but I noticed everybody did not; some of the younger members had no interest in the subjects—thought it was too technical, and the results not showy enough for them—perhaps they went out and had a smoke! However, I made up my mind I was making a mistake in working a quarter-plate camera for lantern pictures alone, for with a plate two and a half inches larger, namely, $6\frac{1}{2} \times 3\frac{1}{4}$, I could make stereographs also, and if I did not want stereoscopic in some cases, I could still have my lantern pictures by putting two on one plate. (I don't mean tandem fashion, as one good friend of mine did the other day at Lyme Hall; he put two pictures on one plate, but could not very well separate them in the printing.)

Well, I made up my mind what to do, and *I have done it*: I have bought a stereoscopic camera with six double backs, the nicest little camera I have seen for a long time. There are plenty of them in the market cheap at present, and of all the cameras that were made fifteen or twenty years ago some of the stereoscopic size were the gems of workmanship, and will favourably compare for that, and even portability, with anything made to-day.

But I fear I am gabbling away without being practical. Everybody wants to read something practical nowadays; a fixed formula—put this and that together, and it will come out so and so; in fact, we shall soon have books on photography like our cookery books. But I will come to the practical by-and-by—if not this time, perhaps before long; but it's no use to tell how to produce results before we know the subject is acceptable.

Will stereoscopic work ever be popular again? I think it will, for more beautiful photographs than good stereoscopic transparencies are not to be seen, and there is no branch in photography more admirably suited to amateurs than stereoscopic and lantern work.

I have made a good few stereo slides during the last week or two, and exhibited them to many of my friends; the result seems healthy, for they were highly appreciated.

A dealer in plates, in Manchester, who keeps a small stock of stereo plates, and who only sells a dozen or two now and then, has been cleared out; he ordered more (the usual quantity); these, too, have all gone. He said to me the other day, "What's going on? There seems quite a run on stereoscopic plates just now. I am ordering by to-night's post a few gross, whereas I usually only order a few dozen."

I don't take all the credit for this, nor do I get any commission, you know; but if this class of photographs have taken a turn, and is going to be popular again, as it fairly deserves to be, then, I say, it will be some encouragement for others as well as myself to give a few practical notes on the subject.

The first thing to do is to make up your mind to go in for it; if

you cannot do that, and want assistance, send to G. W. Wilson & Co., Aberdeen, for a dozen stereoscopic transparencies and buy a stereoscope (you can spend pounds to worse advantage), and if these do not tempt you, pursue this subject no further—throw this paper aside; I shall write no more for you. But if you can make up your mind to go into stereo work, then get a binocular camera and a pair of lenses—from 8×5 to half-plate size will do—but for reasons already stated I prefer the $6\frac{1}{2} \times 3\frac{1}{4}$.

A single lens and sliding front board may be used, but this arrangement is not so good, especially when we have instantaneous work or subjects in which figures and life is introduced. A pair of lenses do not cost much, and single landscape lenses are the best and most useful, from four and a half to six inch focus. Rectilinear and symmetrical lenses are less necessary for stereo work.

Many of the existing cameras which are not provided with a moveable expanding partition can have one applied; but I regret to say most of the modern cameras are made with fronts and lens boards too narrow to admit of a pair of stereoscopic lenses, which should in most cases be placed so that their centres occupy the centres of divided plate, but in no case should the centres be less than three inches—three and a quarter inches would be better—and for many subjects even more would be advantageous.

In conversation with Mr. Harding Warner a short time ago, when I had the opportunity of inspecting some of his charming stereo slides and a new stereoscope, I think he said he used 10×8 plates for those pictures.

I have said they were beautiful pictures, but they were on paper, and I prefer glass transparencies as being more beautiful, almost as easy to make, and suitable to most amateurs, because they can be printed at night, and because we can apply combination photography to the stereoscope better with glass than paper.

Then I keep to the old size, because it is the standard size of all the commercial firms who produce such beautiful results in England, Scotland, and Paris. To alter the size would require a new size of stereoscope, and that would be almost as bad as writing music for a new keyboard of a piano. Then, again, we have them the right size for contact printing for the lantern. They are less expensive, the apparatus less expensive and more portable, and another important point is, that smaller lenses can be used, and these are usually quicker and more perfect instruments than larger ones, and when the slides are viewed by lenses in the stereoscope of the same focal length as those used to take the negatives, we get the effect of natural size. I am now having made, by a jeweller's casemaker, two box stereoscopes, with flanges fixed on, in which I can screw my Wilsonian landscape lenses, one for four and a half and the other for six inch focus.

I saw a beautiful looking camera the other day, 10×8 size. It was made so that half the plate could be used for single pictures and again divided, thus 10×8 pictures on one plate, two 8×5 pictures or four 5×4 pictures could be put on one plate, or two stereoscopic subjects. It would focus from about three inches to goodness knows what. It had arrangements for swinging, tilting, sliding, and revolving, in almost every conceivable direction, and as many brass levers and screws as could be crammed on; in fact, there was not much woodwork to be seen, it was all covered up with lacquered brasswork.

It had too many contrivances for my liking; no sensible or practical photographer would wish to make stereoscopic slides with a thing like that. For my own part, if I want 10×8 pictures I get a camera 10×8 , and if I want stereoscopic pictures I get a stereoscopic camera: the difference in size is too great to mix them up in one instrument.

I remember not long ago a young friend of mine going to learn mechanical drawing. He told his mamma it was necessary he should have a box of drawing instruments. So she took him to a swell optician's shop, and bought him a big rosewood nickel-bound box filled with instruments, *the very best they could buy*, and then came the colour box. As he did not know what tints he *would* require they bought nearly every colour in Windsor & Newton's list. My young friend had to engage a cab next morning to take his tackle to the office. The foreman draughtsman and most of the others engaged, who really *could* draw, had only about a twentieth part of the tackle, and perhaps a piece of washleather to serve for the nickel-bound polished rosewood box.

A good lot of this applies to many of the amateur photographers of to-day. I was very much amused with a friend of mine at a recent outdoor meeting of our Society. He had with him four new lenses, and having tried them all in succession, at last decided upon one he thought best. After making the necessary adjustments, the slide in the camera, and the shutter drawn, he took out a pocket-book and pencil. I watched him for some time, and at length I

thought he must be making a pencil sketch instead of photographing, so I went up to him to see what was going on. He had actually three printed tables and an actinometer at work; the multiplications and divisions he had gone through was astonishing. "What is it all for?" I inquired. "Why, to get at the correct exposure. Can you show me a better plan?" "Yes," I said; and I took the cap off and put it on again. He has told me since it was the only negative he got that day. I don't wonder at it. W. I. CHADWICK.

ON SYSTEMS OF NUMBERING PHOTOGRAPHIC LENSES AND DIAPHRAGMS.

[A Communication to the North London Photographic Society.]

MANY of my hearers will, I am afraid, consider that I have chosen a very dry and uninteresting subject; but when we remember that there are about half a dozen different systems in use amongst photographers it is surely time to weigh one with another, and, retaining the best, dispense with the others.

In deciding whether one system of numbering stops and lenses is better than another, we must keep in view the object or purpose of these numbers. That object is *the easy and accurate determination and comparison of exposures*; and this is, therefore, the test by which we should compare any one system with another.

Before going further, I must, for the benefit of beginners, clear the way by illustrating the meaning of one or two of the technical terms I shall have to use in the course of the evening.

Let us suppose for one moment that a candle is placed at a distance of nine inches from a lens, and that having focussed the image we find the distance between the latter and the centre of the lens to be—as it might be—eighteen inches, then if the candle were moved three inches further from the lens we should find that the distance between the lens and the image, when the latter is in focus, would be reduced to twelve inches. If, again, the object we are photographing is still further off, say eighteen inches, the distance between lens and focussed image will be only nine inches; and if, finally, we turn our camera towards some object a long way off, the distance referred to will be reduced to practically six inches.

These distances of—in the last case—a trifle over six inches, and in the previous cases of nine, twelve, and eighteen inches, I shall call *image foci*, so that when I speak of image focus you will remember that I refer to the distance between the optical centre of the lens, or say the place where the stops are inserted, and the focussed image formed by the lens.

You will have noticed, from the illustrations I have given, the general principle that the greater the distance of the object from the lens the less will be the distance of the focussed image from the same point; but you will find that, gradually reducing the distance between ground-glass and lens, you will at length come to a point beyond which it will be useless to move the ground-glass screen, however far off the object may be, because, if you do move it beyond this point you will only find a blurred image of the object. The distance between the centre of your lens and the ground-glass when the latter is at this point is the principal focus, better known to some of you as the equivalent focus of the lens.

You will notice that while the image focus is always changing, the principal focus, or, more correctly, principal focal length, is constant. It depends upon the construction of the lens, and will not vary unless the lens itself is altered.

I will now explain in a practical manner the two rules which assist us in judging the necessary exposure under different conditions of lens and stop.

The first is that the exposure required will vary in the same proportion as the square of the image focus. For example, suppose that one second is the correct exposure under certain conditions. Now if all these conditions remain, except that the working focus is doubled, then the exposure required will be, *not double* the previous exposure, but 2^2 , that is, four times.

I can best show the truth of this rule with the help of these models, which I have roughly prepared for the purpose. This model (a small model in the shape of a pyramid) represents the direction of rays of light passing through a small aperture, the back of the model representing the layer of light intercepted by an opaque screen.

If you move this screen (the base of the pyramid) twice as far from the point of light as it is at present, the rays, continuing to diverge, will cover a much larger surface, in fact, you will find, on measuring, that the surface now covered is just four times as large as that previously covered; you have just the same amount of light, but it is spread over an area four times as large. The light, therefore, at the surface of *this* screen (the base of the second model—the distance

from apex to base in this case being twice that in the former case) is only one-fourth as concentrated, or, in other words, one-fourth as intense as at the surface of the nearer screen. This being so, the exposure required in order to obtain the same result on a photographic plate at *this* (second) distance from the diaphragm will be four, that is, 2^2 times that required in the former case. Beginners might easily fall into the error of supposing that this rule depends upon the size of the plate, but you will observe that nothing has been said about the size of the plate, but only of the distance of the plate from the diaphragm.

In the same way if I remove the screen to three times its first distance, it will be seen that the light—spread as it is over nine times the first area—is only one-ninth as intense, and a plate will therefore require nine (that is, 3^2) times the first exposure.

If, then, we call the first distance one, and the exposure required one second, the second distance will be two, and the exposure required will be 2^2 , that is, four seconds, and the third distance will be three and the exposure 3^2 , that is, nine seconds, or, in other words, the exposure required varies as the square of the image focus.

The second law relative to exposure is that the exposure required varies inversely as the area of the diaphragm, or, what amounts to the same thing, the square of the diameter of the diaphragm. For example: If under certain conditions the correct exposure is one second, and these conditions are altered only as regards the diaphragm by putting in one of one-fourth of the area of the previous one, then you must give four times as long an exposure. If, again, you substitute a diaphragm twice as large, that is, having twice the area of the first one, you must give half the exposure.

I might explain this by saying that as the aperture is twice as large you will, of course, get twice as much light through it, and consequently will only need to give half the exposure. But as such an explanation would give a beginner no idea of the true reason I will endeavour to explain it.

Rays of light are, as you may know from daily experience, reflected or emitted by materials in straight lines, and in all directions. Here is a sketch showing a side view of a diaphragm with the rays reflected from, say, a small stone. If your lens is turned in the direction of this stone some of the rays will pass through the diaphragm and through the lens, and *being bent out of their course* by the lens, will form on the ground-glass a luminous point corresponding with the stone.

Now you will see at once that if I substitute for this diaphragm one having twice the area, *twice as many rays*—that is, these outside rays which were before prevented from passing to the ground-glass by the metal disc—will now be able to pass through the diaphragm and lens to the ground-glass, where, in consequence of the refracting influence of the lens, they form an image exactly overlapping the previous image. The image is now twice as bright as before and will therefore require only half the exposure. Of course the same explanation applies to *every point* on the ground-glass, and as the *whole image* is nothing but a *number of luminous points*, it applies to the whole image. If we substitute a diaphragm having three times the area of the first one, three times as many rays will be able to pass through to the ground-glass, thus illuminating the image three times as much and requiring therefore only one-third the exposure.

I have now only one other preliminary reference to make and that is with regard to the standard numbers of the Photographic Society; these numbers are based upon a unit which has been found by a committee of the Photographic Society of Great Britain to be the best unit for practical purposes, and as uniformity in matters of this kind is of great value we ought to recognise these numbers and make more use of them than we have hitherto done. Without uniformity—that is, without some recognised standard—there can be no comparison of exposures between photographers.

I am this evening going to speak of five different systems. If any two of these should be found in practice equally good, but one recognises the standard numbers and the other does not, then we must give the preference to the former.

The first of the five methods just mentioned is the *f* system.

I was out with this Society a few days ago, and, standing near two of our members in a wood, overheard the following:—

"I say, Doctor, what exposure ought I to give for this?"

"Well," says the Doctor, "I'm going to give fifteen seconds for $\frac{1}{2}$, and I think that's about right."

After considering this reply for half a minute or so the questioner asked how he could find out what exposure he ought to give for $\frac{1}{2}$ —the aperture he was using. In reply to which the Doctor told him to divide twenty-two by thirteen, square the quotient and multiply by fifteen, and the number thus found would be the required exposure in seconds.

I could not resist remarking to the Doctor that if we could not get more direct answers than that in our everyday work the demand for calculating machines would be on the increase. However, the Doctor was not to blame, for he did the best that could be done with the system. Yet nearly everyone expresses the rapidity of his lenses by means of this system—the beginner sometimes because his stops are numbered according to this system and sometimes because he knows no other plan; the professional partly from habit and partly because, as he very seldom *calculates* his exposures, it does matter to him how his stops are numbered. Besides the objection to the *f* system which I have illustrated there are three or four others, but as they constitute the whole of the objections to the next system I shall speak of I will not discuss them here.

As I illustrated the working of the *f* system so I will now illustrate the uniform system. The Doctor has been asked what exposure is required for U. S. No. 22, to which he replies that he intends to give fifteen seconds for U. S. No. 13. "To find the exposure you ought to give," adds the Doctor, "divide twenty-two by thirteen, and multiply by fifteen; the number thus found will be the required exposure in seconds." There is, however, no need for this amount of calculation. If I wanted to know the value of twenty-two yards of cloth I should expect to be told the price *per yard*, not the price for thirteen yards; and we all know that there can be no simpler way of quoting prices for commercial purposes than this. Yet it does not seem to have occurred to photographers that this simplicity can be applied to their own work—that, as drapers always quote the price of cloth per yard, having in view *one idea* only, that is the quality of the cloth, so it is possible for photographers to quote the exposure per unit, that is, in this case per standard number, having also only one idea in view, namely, the actinic power of the light reflected from their object. If this plan of quoting exposures per standard number were adopted we should have in the uniform system the simplest plan that could be devised.

The *simplest*, certainly, but not the most accurate. It answers our purpose to put up with a certain amount of inaccuracy for the sake of simplicity, but in some cases the U. S. numbers are so inaccurate as to be quite useless.

You will readily see that these numbers are not really comparative exposure numbers, for the latter, as you know, vary with the square of the image focus, while the U. S. numbers depend on the square of the principal focus. In taking landscape and distant views there is only a very slight difference between the latter and the image focus, so that in these cases the U. S. number may be used as the comparative exposure number. But for indoor work—portraiture, copying, or enlarging—where the image focus varies very considerably from the principal focus, the U. S. numbers are *too* inaccurate. In these cases, therefore, the photographer must find some other system.

Again, a person working with a set of combination lenses cannot use this method; for what will be U. S. No. 30 with one combination will be U. S. No. 50 with another. Diaphragms are sometimes sold apart from lenses, such for instance as those sold with Grimstone's instantaneous shutter. These cannot be numbered by manufacturers in accordance with either the *f* system or the U. S. system.

All these objections may be removed by eliminating from the U. S. number that part of it which depends on the principal focus. The formula for finding the U. S. numbers is $P^2 \times \frac{1}{16a^2} (= \frac{P^2}{16a^2})$, and that for finding comparative exposure numbers is $m^2 \times \frac{1}{16a^2} (= \frac{m^2}{16a^2})$. (P = principal focus, a = the aperture of the diaphragm, and m = the image focus.)

Following the suggestion I have just made, our stops will be numbered in accordance with the formula $\frac{1}{16a^2}$, so that to find the comparative exposure numbers we must multiply these stop numbers by m^2 . On putting this into practice, however, we shall find that these stop numbers will be rather too high for easy use. This difficulty, however, may be overcome by slightly altering our formulæ; thus $\frac{m^2}{4} \times \frac{1}{4a^2} (= \frac{m^2}{16a^2})$, though as you see we do not alter the result.

While these formulæ are on the board I may as well show you what sort of numbers they will give. Taking the usual run of stops to be from one-twelfth of an inch in diameter to one and a half inches, and the image focus to extend from four inches to twelve inches the numbers will be, for the lenses from four to thirty-six, and for the diaphragms from thirty-six to one-ninth.

These numbers are not too high to deal with easily. This one ($\frac{1}{4a^2}$) you will have stamped on your diaphragms; but the other you cannot have stamped on your lens for it is constantly altering, and it would be absurd to suggest the practice of measuring the distance between ground-glass and lens and making use of the formula $\frac{m^2}{4}$. The simplest way of getting over this difficulty is certainly by

means of a measure such as this one which I will presently pass round. It is marked in such a way that on placing one end against the centre of your lens you will see the value of $\frac{m^2}{4}$ on the tape opposite to the ground-glass.

This system is technically perfect and may be applied in every case; a stop marked in accordance with it is correctly numbered whether used with a six-inch combination or a nine-inch, whether you are doing landscape work, or enlarging, or copying. I would suggest that all stops be marked in accordance with this formula ($\frac{1}{4a^2}$) as well as with the U. S. number, so that in taking distant views the photographer may, by using the U. S. numbers, avoid all calculation, and where circumstances do not permit of his using U. S. numbers, then he can use the method which I now recommend and which I think will be best described as the comparative exposure system.

I have now to speak of the area system. The formula for finding the stop number is $\frac{(64a)^2}{10}$, and for the lens number $\frac{(4f)^2}{10}$. This system is not to be condemned on account of the complicated formulæ upon which the numbers depend; but we shall not find the *numbers themselves* everything that could be desired. Taking the same range of stops and lenses as before, you will find that under the area system the stop numbers will run from 2 up to 920, and the lens numbers from 25 to 230. In presence of such high numbers I do not think it necessary to make any further remarks on this system—we are literally overpowered by numbers.

I will draw your attention to a formula, given in connection with this system, for finding the area numbers of any combination when you know the numbers of the separate lenses.

The formula is $\frac{x+y}{8}$, x and y being the area numbers of the separate lenses. This formula is remarkable for its simplicity and its inaccuracy. Take a combination composed of a five-inch and a nine-inch lens—the area number for the combination according to the formula given would be 21, but according to the true formula 16. The fact is, the formula given is true in one case only, and that is when the two lenses are of equal focal lengths, and this is a case which you never find in practice, for no combination set has two lenses of the same focus.

Another objection to this system is that it takes Standard No. 16 as its unit and not Standard No. 1. And as the lens number depends on the principal focus, it is, in common with the *f* system and the uniform system, inaccurate when the object is at a less distance from the camera than twenty times the focal length of the lens.

Stops are sometimes numbered 1, 2, 4, 6, or, as the case may be, in accordance with the comparative exposure required, calling the largest diaphragm No. 1; but as the size of the largest aperture will vary in different sets of stops this method depends upon variable units, thus preventing any comparison between one photographer and another, besides rendering difficult the use of tables of exposure such as Mr. Burton's or Mr. Howard Farmer's. This plan is therefore practically useless.

I have now been through my list of systems, and have selected as best the joint use of the U. S. and the comparative exposure systems. It will be useless to mark stops already cut with the formula $\frac{1}{4a^2}$, because the numbers would probably be found to be decimal numbers or numbers too clumsy for easy use; but, of course, diaphragms may be cut so as to give the simplest numbers possible. To show this clearly, as well as to show how the union of systems which I have recommended would work, I have prepared a table similar to No. 3 table in Burton's *Modern Photography*. In a slightly extended form this table would be very useful to those manufacturers who might wish to number their stops in accordance with the plan here suggested. The second column shows the exact diameters of all the stops that would be necessary from one-thirteenth of an inch to three inches, the first column shows the Nos. of the drills to be used for cutting these stops, and the third column gives the comparative exposure stop number. This number would be stamped on the diaphragm and would be correct whatever lens it was used with. The other columns show the U. S. numbers in just the same way as in Mr. Burton's table.

Suppose that a person wants a set of six stops for a ten-inch focus lens, the full aperture of which is not quite one and a half inches. He will find in the second column the diameter 1.4 as the next stop smaller than one and a half inches; against this diameter he will find on the one side the drill to be used, and on the other one of the numbers which will be stamped on the diaphragm; further along, under the column headed focal length 10 is the U. S. number, which *also* will be stamped on the diaphragm. Then looking up the same column he will see the U. S. numbers ranging up to 400 for various sized stops; he finds against No. 400 that the diameter of this stop would be

one-eighth inch, but as he does not want so small a stop he makes use of the next row—No. 9 drill, Comparative Exposure Stop No. 12, U.S. No. 316. Then having decided upon the largest and smallest stops, he can choose intermediate ones from the list at his pleasure and in a similar manner.

The comparative exposure stop numbers are here preceded by either a multiplication or a division sign; this prevents the possibility of any one forgetting how these numbers are to be applied to the number on the tape measure, and in the case of the numbers preceded by the division sign it is simpler to write $\div 6$ than $\frac{1}{6}$. It will be seen that the U.S. numbers are in most cases rather high and awkward numbers to deal with, but there is no necessity in practice for extreme accuracy. It will be quite near enough if instead of numbering a stop 7.11 it is numbered 7; 9.68 can be numbered 10, and so on. But the fact of these numbers being odd and high numbers is not really of very much consequence, for you do not have to go through a series of calculations with them in order to arrive at the requisite exposure as you do in the *f* system. Having in your mind Mr. Burton's or Mr. Howard Farmer's list of exposures for Standard No. 1, you have merely to multiply these by the U.S. number.

Here is a table of area system numbers, taking the same lenses and stops as in the previous table. The top row consists of the principal foci, and immediately beneath these are the lens numbers; in the first column are the drill numbers, and against them the stop numbers. It will be seen that there is but little to choose between this table and the other as regards the character of the numbers, but in the area system you have two numbers to deal with—the one having to be divided by the other. In the uniform system you have the quotients worked out and stamped on your stops, while in the area system you have to work them out yourselves.

In conclusion, I strongly recommend every one in speaking of exposure required to give the exposure per unit, that is, per standard No. 1 ($\frac{f}{4}$).

I would also advise those who have stops marked according to the *f* system to renumber them in accordance with the uniform system. This is done by dividing the *f* number by four and squaring the result. For example, take $\frac{f}{4} = 24$ divided by 4 = 6, $6^2 = 36$, and this is the U.S. number. O. SMITH.

PHOTOGRAPHIC PAPERS AND PAPER MAKERS.

III.

We have seen that the good typical photographic paper used by Captain Pizzighelli and Baron Hübl, is that known to the trade as "ivory vellum wave," bought from the mills when but half sized, the final sizing of gelatine or starch being given to it by the photographers. When such paper is finished at the mills to be sold as writing-paper, a final sizing with gelatine and alum is also given to it, but the gelatine may not always be of the hard description which a photographer would be wise to employ; however that may be, the fact is now elucidated that when a photographer wishes to try experiments in printing processes upon plain paper, and at his own risk ventures to use such papers as he can buy at stationers' shops, that which is most likely to answer is "the best cream or ivory vellum wave writing-paper," with or without a resinous foundation. Sometimes it answers well for certain plain paper processes; its chief defect is that it too readily absorbs aqueous liquids. Sometimes it may contain injurious impurities as "fillings;" sometimes also traces of thiosulphate of soda are found in it, in which case it is useless for silver processes, but manufacturers can obviate this by substituting sulphite of soda to neutralise the chlorine after the bleaching of the pulp, taking care that the sulphite is used in moderation and not in excess.

Real cream or ivory vellum wave papers are not kept at many stationers' shops, and something else is sometimes tendered as such in their place, the point not being thought by the vendor to be of importance.

All papers used in photography should be made of cotton fibre; the cellulose from wood, which is now turned out of such good quality that experts often have difficulty in telling whether it enters into the composition of a paper, yellows with age and under the influence of certain chemicals more rapidly than does cotton cellulose. The paper made of rags which have never been used, and which are new and clean, is strong. It makes a harsh noise when cut with a knife, and offers more resistance than other papers to the passage of the blade; in photographic baths it is more tenacious and less liable to tear than other papers, which are qualities of no small value. Great harshness is not altogether preferred when making writing papers, a mixture of pulp from cleansed old rags being usually mixed with pulp from new rags, to impart additional flexibility.

Captain Pizzighelli and Baron Hübl state that the paper they

use, and cover themselves with a special gelatine or starch sizing, comes from the mills half resin sized. The resin is probably dissolved in carbonate of soda, and then mixed in with the pulp before the latter flows upon the machine. Should any English makers begin to meet the demand for photographic papers, this part of the operation demands their critical attention. Common rosin makes anything but a durable varnish, and something more stable might be substituted for it in half sizing papers in the manner stated. Rosin is furthermore to be viewed with suspicion from its manner of preparation; it is the residue left in the retorts or pots after distilling or boiling off the turpentine, and who is to say how much iron rust and other impurities get into it from the use of unclean iron vessels? Possibly some of those iron spots which have troubled photographic paper makers have not come from carefully cleaned machinery, but from rosin boiled down in the backwoods. Evidently the alkaline sizing material should be carefully filtered more than once before use. Some papers are said to yield under sulphur tests evidence of the general presence of iron; may not some of the resinous acids possibly take up traces of oxide of iron from retorts in which the turpentine is distilled off? Shellac is a resin of recognised good character for photographic purposes. The New Zealand cowrie gum is cheaper, and has some of the properties of copal. Both shellac and cowrie gum are soluble in alkaline liquids, so to these two resins attention might be given when making a partly resin-sized paper for photographic purposes. Writing papers of the highest quality contain no resin of any kind.

Recently I had the pleasure of going over the works of Messrs. Joyson & Son, St. Mary Cray, Kent, which firm has long been noted in this country for the manufacture of high class writing papers.

Into the operations of making the pulp from linen rags, and then bleaching it, it is not now necessary to enter, but it may be mentioned that the men in the bleaching rooms, in which there is always a feeble smell of chlorine, seem to be more protected against some classes of disease than are others not so employed. The only objectionable physiological effect of the traces of chlorine seems to be that it in time somewhat yellows the balls of the eyes of the workers.

The pulp having been placed in a feeding trough, is evenly discharged upon the fine "wire cloth" endless band of the paper making machine, and this shallow pool of emulsion is thereby carried on to the first pair of rollers. Before it reaches them the "watermark" is printed from a single roller carrying the design in relief. This design is distorted as carved upon the roller, because the paper is subsequently elongated more in one direction than the other, and this second distortion rectifies the printed impression of the first one. The watermark is usually a nuisance in plain paper photographic processes. Often, especially in landscapes, it comes upon such a part of the picture as to do no harm; it is most objectionable when it comes across the face in a large head. When the prints are wet, the watermark often spoils the appearance of the picture when it will not do so after drying. There is a difficulty, especially to non-experts, in telling which is the right and which is the wrong side of cream vellum wave writing papers, and a photograph taken upon the wrong side will often be a bad one, for all the natural roughness due to wire marks reappears after passing through the bath and drying. The watermark is no guide, except with the particular batch in use, as to the right and wrong side of the sheet, for sometimes it is printed to read right from one side and at other times from the other side. Hence, in a photographic paper, a very small watermark at each corner of the sheet, and consisting of the word "back," would be useful.

The first pair of rollers which receives the pulp administers to it very gentle pressure, after which the pulp adheres somewhat to the lower roller, but is drawn from it by the second pair of rollers between which it has to pass. This pulling of the soft pulp from the roller already mentioned causes many of the fibres to arrange themselves in the direction of the line of tension, and this is the cause of that great trouble to photographers of wetted papers elongating more in one direction than they do in another. Their breaking strain varies also in the two directions; a piece cut out of a sheet of paper in one direction will sometimes bear fifty per cent. more weight than a piece cut at right angles to that direction.

In the course of its passage along the machine, the paper enters the sizing bath. The gelatine in this is made at Messrs. Joyson's works, by boiling down the skins on the premises, skinning off the oil, mixing in some alum, and using it at once. On the machine it is kept at a suitable temperature. In this sizing bath we come to a point at which in photography two roads branch off. For some photographic processes a sizing of gelatine is the best, or, at least, is not objectionable; for others, and perhaps the majority, a sizing of pure starch, in the shape of arrowroot, is best. Certain salts of the noble metals tend to throw down a precipitate when they come into contact with gelatine, and this precipitate may be insoluble in the

fixing liquids, in which case we have photographs likely to darken in the whites by lapse of time, or by the presence of impurities in the atmosphere. Recently I published that a discrepancy existed between the statements of Mr. W. Willis and Captain Pizzighelli as to the relative values of gelatinous and starch sizings in the platinotype process; since then Dr. Vogel has published in the *Photographische Mittheilungen* that platinum prints upon a starch substratum discolour less in the whites under the action of sulphuretted hydrogen than they do upon a gelatine sizing, so that by Dr. Vogel the statements of Mr. Willis are fully supported.

On some of the machines at Messrs. Joynson's works, the paper, after being sized, passes over dozens of light wire-work rollers, in the centre of which are revolving fans, so that by the time it has slowly reached the end of the series it has been dried at nearly the normal temperature of the air, the machine rooms being but moderately warm. The weight of water thus carried off by the air of the rooms in the course of a day is considerable. Finally, the paper is cut into large sizes, and delivered cut and dried at one end of the machine, which at the other end it had entered in the state of pulp.

Fine writing papers are pressed in small sizes, by placing each piece separately between two polished sheets of copper or brass, the whole being then passed between steel rollers driven by steam. This is found to be the best way to get a fine surface.

W. H. HARRISON.

Our Editorial Table.

THE OPTIMUS EURYSCOPE.

London: Perken, Son, & Rayment.

WHILE we greatly dislike to be dragged into anything that bears the semblance of a disagreement among opticians, yet do we see no way of escape from that position as it at present exists between two large, responsible, and highly respectable firms, one at home and the other abroad.

The term "Euryscope" is the bone of contention at present between Messrs. Voigtländer on the one hand and Messrs. Perken, Son, & Rayment on the other. As will presently be seen we hold that it belongs by right of initiation to neither of these firms. But being public property it is open to be accompanied by a qualifying adjective. Why we say that the term "Euryscope" is public property is this: Several years anterior to its adoption by either of the two firms mentioned it was in common use in an optical establishment in the Strand, that of Mr. John Browning, who volunteers proof thereof by printed catalogues, ledger entries, and other means. This we have ascertained as a fact beyond doubt.

Assuming that the term "Euryscope" may now be held, in photography, to indicate a lens of the Steinheil type in which the angular aperture exceeds $\frac{1}{2}$, any distinction between the productions of two or more makers must be indicated by the qualification of the manufacturer's name or his trade mark, such as "The Voigtländer Euryscope," "The Optimus Euryscope," and so forth.

We are not so conversant with the Greek language as to be able to give the exact phase of signification of the word "Euryscope," but on the assumption that it is connected with seeing widely or expansively, or taking in a considerable field of the subject under consideration, we scarcely think it to be the best term to convey a precise idea of the peculiarity sought to be embodied, which should, from its increased angular aperture be that of a "bright light;" hence the term *leukoscope* as applied to a certain lens of American manufacture.

We have said before, and it is scarcely worth saying again, that the lens, the name of which is now in dispute, was invented both in its general form and the materials out of which it is made, by the late M. Steinheil, of Munich. In form it is a doublet, each lens of which is a cemented compound composed of a concavo-convex (convex side out) to which is cemented a meniscus, or convexo-concave. The former is a diminishing lens, and is formed of dense flint; the latter is a magnifier and is composed also of flint glass, but having a lower index of dispersion than the other. In fact, as regards their relationship to each other they are analogous to ordinary optical flint and crown glass. We have nothing here to say regarding the patent obtained in 1877 by Messrs. Voigtländer for their modification of the Steinheil lens, having said all that was necessary as to this at the period when the specification was published.

We now turn to the "Optimus Rapid Euryscope," manufactured by the firm of Perken, Son, & Rayment, Hatton Garden, an example of which is on a camera on our editorial table. With its full aperture of one and three-quarter inches (its equivalent focus being eleven inches) it defines with extreme brilliance, and when used with a stop

it easily covers a 10 x 8 plate to the corners, which is larger than that engraved on the mount as its possibility. Working as it does with such a large aperture ($\frac{1}{4}$ approx.) it serves as a portrait and group lens as well as a landscape and copying objective. There is no doubt of its proving a most useful lens. Altogether, by whatever name it may now or henceforth be known, this "rose smells sweet."

VIEWS IN AMERICA.

By JOHN REID, Paterson, N.J.

WE have this summer been favoured by visits from an unusual number of gentlemen, and ladies too, from America, connected either as amateurs or professionals with photography. It cannot be too well known that we are always glad to see visitors from a distance, and to place at their disposal all the resources of our offices, and also that of a commodious dark room in which to develop or change their plates.

Among our latest visitors was Mr. Reid, the well-known photographer of the large manufacturing city of Paterson, New Jersey, who has left with us several examples of his work. These are all taken direct, in contradistinction to being enlargements, a fact necessary to be mentioned when we say that some of them measure close on thirty inches. The largest pictures, which represent engineering productions, were, Mr. Reid informed us, taken by a single lens of fifty-two inches focus, the front element of a large portrait combination.

In large groups Mr. Reid is eminently successful, to judge by the Caledonian Society of Paterson; while his *Passaic Falls*; view of *Union-square, New York*; the palatial *Residence of C. Vanderbilt*; *Trinity Church, N.Y.*; *Groups of Curlers*; *Statue of Liberty*; and the intensely funny scenes caught on the beach at Coney Island, equally attest the skill of the artist in other directions.

THE MANCHESTER EXHIBITION.

V.

THERE are so many high-class photographers in the Manchester Photographic Society, that it would have proved no difficult matter for them alone to have provided material for a photographic exhibition worthy of the period without external aid.

When we examined a view, *Near Odde, Norway*, by Abel Heywood, jun., we made a note, "This ought to have been hung lower; it would well bear it." But Mr. Heywood has others to which this hint does not apply, amongst them being a *View on Ribble*, possessing fine atmosphere, and a *View in Patterdale*. In addition to four fine views of and in Hardwick Hall, J. B. Greatorex has a nice *View of Lynmouth*, and in another frame a series of views of this favourite North Devon resort, with similar views of other localities.

The portrait of the Lord Bishop of Chester, by Rev. H. V. Macdonald, is a noble piece of work. The face of the portrait of Thomas H. Nevill is all that can be desired, but from the point of view occupied by us during examination it seemed as if a little more detail in the coat would have enhanced it. Would this have arisen from its being a bromide enlargement? The *Yachts on Windermere*, by J. W. Kenworthy, are good; but the "*Isaac Walton Inn, Dovedale*," by this artist, would have been improved had a little bit been trimmed off the foreground. This applies also to one of Mr. Hutchinson's otherwise excellent views. Quite a number of charming pictures are exhibited by C. H. Coote and also by W. G. Coote, the latter artist having succeeded well in the difficult feat of getting a lady admirably posed in the foreground of one of his views. Of several excellent subjects contributed by E. Leader Williams we must congratulate him upon having "spotted" a most capital one in his *Cottage in Worcestershire*, of which he has made a very attractive picture.

We expected to see a plethoric outcome of the visit lately paid to America by the Honorary Secretary, W. I. Chadwick, nor were we disappointed. In most, if not in all cases, his exhibits are enlargements from small negatives.

Mr. Chadwick acted most sensibly in preferring a small to a large camera as his *compagnon de voyage*. Concerning this journey we remember him writing to us, "I used only quarter-plates on my American trip. I made 350 good negatives; developed twenty-four in America, and the others after I returned to England; and the twenty-four developed on the spot are about the worst of the lot. I shall never develop again from home." We have inserted this as a piece of practical information to many who, about to go abroad, are undecided as to the propriety of developing their negatives *en route*, or delaying this operation till they return.

But in addition to many highly interesting American views, in which Niagara is well cared for, Mr. Chadwick contributes also a nice series of 5 x 4 pictures, *Holiday Reminiscences in the Isle of Man*.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

- No. 10,794.—“Improvements in Photographic Roller Slides.” J. E. THORNTON.—*Dated August 6, 1887.*
- No. 10,814.—“The Preparation and Treatment of Paper, Woven or Tissue Fabrics, Glass, or other Material, for the Production of Copies of Drawings, Designs, Pictures, Photographs, Writings, and the like, by the Action of Light.” H. J. SHAWCROSS.—*Dated August 6, 1887.*
- No. 10,841.—“A Combined Clamp and Tripod Head for Carrying Photographic Cameras, or other like Purposes.” J. L. BERRY.—*Dated August 8, 1887.*
- No. 10,870.—“Improvement in Photographic Dry Plates.” W. J. WILSON.—*Dated August 8, 1887.*

PATENTS COMPLETED.

IMPROVEMENTS IN BOXES FOR HOLDING PHOTOGRAPHIC PLATES.

No. 11,615. SAMUEL DREW ARUNDEL, Penn-street Works, Hoxton, Middlesex.—*September 13, 1886.*

My invention relates to an improvement upon the boxes at present in use in which photographic dry plates are packed by the manufacturers, its object being to facilitate the removal of the plates, which with the grooved boxes at present in use is somewhat difficult. The boxes are usually made of cardboard, strawboard, or other light material, and are formed with a draw-off cover of considerable depth, in order that the light shall be prevented from getting to the plates, the inside ends having grooves of corrugated paper, or tin, either plain or paper covered, or cut wooden grooves, in which the plates are held. My invention consists in forming on such a box at both ends a hinged flap above the level of the grooves (which would not be carried quite up to the top of the box), and which flap may be readily bent back, exposing the edges of the plates, so that they may be conveniently removed by the fingers without the necessity of reversing the box and dropping all the plates forward before one can be picked out.

The hinge or flap may be formed in many different ways, but the most convenient I have found is to score the ends across at a distance of about half an inch from the top, so that the card or strawboard may be bent outwards when a plate is to be removed.

In this way, when the cover is on, if any light were to find its way underneath it at the ends, it would be deflected up into the cover, and would not pass over the top of the plates, so that the box remains fully as light-tight as the ordinary one, while, when the original purpose of the box is served, the flap may be torn off, and when used for storing negatives the same advantage will be experienced.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
August 15.....	Notts	Institute, 9, Shakespeare-street.
„ 16.....	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
„ 16.....	North London	Myddelton Hall, Upper-st., Islington
„ 16.....	Bolton Club	The Studio, Chancery-lane, Bolton.
„ 17.....	Bristol and W. of Eng. Amateur	Queen's Hotel, Clifton.
„ 17.....	Bury	
„ 17.....	Hyde	Mechanics' Hall, Hyde.
„ 17.....	Manchester Club	
„ 17.....	Edinburgh Photo. Club.....	5, St. Andrew-square.
„ 17.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
„ 18.....	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION. On Thursday night, August 4, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. J. B. B. Wellington presided.

The HON. SECRETARY read the following letter from Professor Stebbing:—
“DEAR SIR,—In answer to your letter of the 27th, I have the honour to inform you that on the 21st of March, 1887, the youthful Photographic Society of Douai sent in a proposition to the Commission of the forthcoming Universal Exhibition of 1889, in which they emitted a desire that a Photographic Congress should be held. This proposition was favourably received not only by the Commission but also by the Committee of the Department du Nord.

“This idea has not been followed up as perhaps we might have hoped. The President of the Société Photographique du Nord writes me that they have not up to the present issued any circulars; their rôle has been simply to indicate the questions which, in their opinion, ought to be brought before the Congress. The President adds, ‘It appears to me that it is the duty of the Special Committee of Class 12 (Photography) to compose a programme of such a Congress, to invite professional photographers, amateurs, and manufacturers of every country.’

“This is, Dear Sir, the only information I can give you very honourable Association, to whom, as well as to yourself, I forward on my best compliments,—Prof. E. STEBBING.”

It was resolved to telegraph from the Association a message of congratulation to the American National Convention of Photographers, now sitting at Chicago.

Mr. W. T. WILKINSON, of Cambridge, said that the air brush could be utilised in photo-mechanical work. He charged it with a solution of bitumen and caused it to discharge fine spray over a polished copper plate; with a little practice a kind of aquatint in appearance could be evenly distributed over the surface. A carbon print from a transparency was then squeezed down upon the plate and developed thereupon, after which it was put in perchloride of iron to etch the plate where not protected by the print and the minute particles of bitumen; the protection afforded by the latter gave the necessary grain; the plate was next washed, put in the press, and proofs pulled. The distance of the brush from the plate when distributing the spray influences the character

of the proofs. The shadows of the print are given by the depressions in the plate. After the carbon print is developed upon the plate it is hardened by alum. The plate must be etched directly the print is finished, and must not meanwhile be allowed to dry. The principle of the process is very old, and was used by Fox Talbot.

Mr. A. L. HENDERSON asked if Mr. Wilkinson would exhibit some plates and the results.

Mr. WILKINSON, for some reasons he stated, was unable to give a promise to that effect.

Mr. A. COWAN asked if good depth in the shadows were obtained or if the prints were flat-looking.

Mr. WILKINSON replied that he obtained good depth in the shadows. Mr. HENDERSON supposed that sandpaper put over a copper plate coated with bitumen and run through the press would give a grain.

Mr. WILKINSON said that the gradual action of the perchloride of iron could be seen, and that the etching had to be stopped just when it began to touch the lights; he used a half saturated solution. The inking of colotype plates is difficult; the ink bought in the shops is usually too hard, and should be lowered with lard; it takes from twenty minutes to half an hour to properly charge the roller for colotype work, and then the observer would think that there was almost no ink at all upon the slab; beginners usually fail by applying too much ink. Very long exposures are supposed to be necessary in the direct bitumen process, but if the bitumen is properly prepared with ether printing upon it is as rapid as upon albumenised paper, and it will give as perfect half tones as will silver.

Mr. HENDERSON remarked that the Chairman had found out a way of preparing plates, by which it was simply impossible to make plates frill if the attempt were made to do so.

The CHAIRMAN stated that he did this by soaking the cleaned plates for a few minutes in a solution of chrome alum and water, the particular strength of which was not of much importance. He then rubbed them with a clean rag under water running from a tap, and afterwards stood them up to dry.

Mr. W. H. HARRISON thought that the study of the properties of thin films upon previously cleaned solid surfaces would be useful in photography. Bunsen had tried experiments as to the power of adhesion of such films, and calculated that their pressure to the square inch was enormous.

Mr. COWAN said that one way of obtaining a chemically clean surface to glass was to coat it after ordinary cleaning with a solution of gutta-percha, and allow the same to dry. When dry the film was stripped off and left an absolutely clean surface. A film of gutta-percha was used up over each plate, so the plan was expensive.

Mr. L. MEDLAND exhibited an old-fashioned dark slide of Marion's make, which he had found to work well, and which was extraordinarily light. It consisted of the front and shutter of an ordinary dark slide, but after the plate was put in position light was kept from it by folds of opaque flexible material fixed to the wood by one edge, but which were then laid down one upon the other over the back of the plate. It was perfectly light-tight, and should be comparatively inexpensive. For half-plate size such slides made a difference of nearly two pounds weight in his baggage over twelve exposures.

The CHAIRMAN used vulcanite slides. Two and a half of them weighed but as much as one ordinary slide.

Mr. HENDERSON exhibited sensitometer prints upon plates which had increased in sensitiveness from twenty-two to probably twenty-eight by keeping. Perhaps they were slightly damp when packed.

Mr. COWAN had tested Mr. Henderson's plates just mentioned, and there was no question as to their excessive speed.

Mr. MEDLAND spoke of the camera devised by Mr. S. C. Nash, of Harrisburg, Pennsylvania, which had no dark slides at all. Mr. Nash was coming over to England shortly, and he (Mr. Medland) had written to him that they would be very pleased to see him at a meeting of their Association.

The proceedings then closed.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual bi-monthly meeting of this Society took place on August 2 at Myddelton Hall, Islington.—Mr. J. Traill Taylor, President, in the chair.

The minutes of the previous meeting having been read and confirmed, the PRESIDENT, referring to the proceedings of the last meeting, showed two negatives taken at the Alexandra Palace with a detective camera which was fitted with the American pattern dark slide, where the shutter is entirely removed during the exposure. He had allowed the full sunlight to fall upon the dark slide during exposure, but still there was not the slightest trace of fog in the negative. He did not believe that there was any necessity to attach so much importance to the finders usually fitted to detective cameras. He had made a great many exposures while holding the camera in his hand, and could point it so accurately as to be able always to place any given object in the centre of the plate at will, and he found no difficulty in keeping the camera perfectly level.

Mr. S. G. B. Wollaston exhibited a diaphragmatic shutter invented by Mr. C. Wollaston, and also several prints from negatives taken with it. The principal advantages claimed for this shutter being that it would give an exceedingly rapid exposure, which had been ascertained by experiment to be less than the one-hundredth part of a second; that the shutter, being placed between the lenses and opening and closing at the centre, the utmost evenness of illumination was obtained; that the shutter did not in the least degree cause the camera to shake; and that in using this shutter there was not nearly so much falling off of definition at the margins of the negative as was the case with a great number of shutters sold in the market.

Mr. OCTAVIUS SMITH then read a paper on *Systems of Numbering Photographic Lenses and Diaphragms* [see page 505], illustrating the laws of light connected with the subject by means of diagrams on the blackboard and by models.

Mr. F. W. HART said that when he commenced photography there was no such thing as being troubled about exposure tables and numbers of diaphragms and lenses. It was only within the last few years that photographers had commenced to worry themselves about these matters. In the old days a

photographer looked at the ground-glass screen of his camera for a short time, and after a little reflection said, "Well, that will take fifteen seconds," or a minute, as the case might be, and it was seldom that he found himself wrong in his calculation. Now it was customary to work out the exposure necessary with the aid of four or five very complicated tables. He advised everyone to go back to the old method and trust to experience. At first they might spoil a few plates, but after a time he was sure they would get on much better than with the tables.

Mr. L. MEDLAND had tried working with the aid of exposure tables, but could not succeed with them. He remembered once being out with a friend who had a strong belief in their usefulness, and he got him to calculate an exposure from his tables, and found the resulting negative so much over exposed as to be almost useless even after intensification.

Mr. F. W. COX said he knew Mr. Medland's friend, and thought it only fair to say that he was a very successful photographer and produced excellent work with the aid of exposure tables.

Mr. GEORGE SMITH thought that the lecturer had complicated his paper by speaking of the principal focus of a lens, and also that he had been too exact in working out the various formulæ in the manner he had done. He would like to correct Mr. Smith, and denied that there was the amount of error which had been stated in the formula which he gave in connection with the area system. He did not say that it was mathematically correct, but it was quite near enough for all practical purposes. In the area system he had adopted $\frac{1}{16}$ as the unit, as it was the largest aperture used in ordinary landscape work, and he could not see that it would be at all advantageous to adopt $\frac{1}{4}$ as the unit.

Mr. A. MACKIE could not help noticing how extremely accurate Mr. Smith had endeavoured to be right through his paper. He did not think the subject so important as some people attempted to make it, for after the tables had been most carefully compiled there were such matters as the rapidity of the plate and the chemical quality of the light to be guessed at; and, taking all things into consideration, it was, in his opinion, far easier to make a correct exposure by one's experience than by the use of exposure tables.

Mr. TAVENER considered that there was very great latitude in exposure provided the developer was regulated accordingly.

Mr. GEORGE SMITH said, that as the exposure depended so much upon the distance of the object from the camera, he considered Mr. Howard Farmer's tables were the most useful.

The PRESIDENT said that many photographers, after having made a correct estimate of the necessary exposure, were unable to calculate the time in cases of short exposures, and recommended a system of mental calculation instead of using a watch.

On the motion of the HON. SECRETARY, the further discussion of this paper was adjourned until the next meeting, which will take place on the 16th instant. Visitors are invited.

An excursion was arranged for August 13 to Wood-street, Walthamstow, for Epping Forest. Trains from Liverpool-street every half-hour.

A vote of thanks to Mr. Smith for his paper terminated the meeting.

Correspondence.

Correspondents should never write on both sides of the paper.

AUGUST MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE.—OPENING OF THE EXHIBITION AT PARIS ON THE 12TH INSTANT.—A FORMULA TO PREVENT THE ROLLING UP OF PROOFS.—CAN DIAPHRAGMS BE CHANGED AT WILL WITHOUT REFOCUSING?—PROPOSITION MADE BY PROFESSOR STEBBING FOR A PHOTOGRAPHIC CONGRESS AT PARIS DURING THE EXHIBITION OF 1889.—ALSO PHOTOGRAPHIC CONVENTIONS AS THOSE OF DERRY AND GLASGOW FOR FRANCE.—DISCUSSION ON THAT SUBJECT.—A MODIFIED CAMERA.—GELATINO-CHLORIDE PLATES IN THE CAMERA.—A NEW PHOTOGRAPHIC ENGRAVING PROCESS.

The Photographic Society of France held their monthly meeting on Friday evening last, M. Davanne in the chair.

M. Davanne informed the members that the Exhibition "*des Arts decoratifs*" would open its doors on the 12th instant. After having spoken of the taste displayed in the organization, and the large part allowed to photography, he continued by saying that he deplored that so few French photographers had exhibited. "Nearly all are foreigners," said he, "and it is strange indeed that our countrymen call aloud for exhibitions, and when one is at hand they are found wanting."

A Belgian has given, said the Secretary, the following formula to prevent unpasted proofs from curling up. Plunge the proof into the following solution after their last washing:—

Water	1 part.
Aleohol	4 parts.
Glycerine	3 "

A great discussion took place upon whether or not a subject could be focussed with a certain size diaphragm in the lens, and this diaphragm be then changed for another without refocussing being required. As a great divergency of opinion was manifested on the subject, it was agreed that a theoretical paper should be solicited in the *Bulletin*.

Professor Stebbing made the following communication:—

"M. LE PRÉSIDENT ET CHER COLLEGUES,—I have lately received several letters from abroad expressing the desire that an International Congress of Photography should be held in Paris during the forthcoming Universal Exhibition of 1889. I have the honour to propose that the Photographic Society of France study this question, which interests the photographic community at

large. Such a reunion of savans, photographers, and amateurs would not only have an immense importance for the future of photography, but would give a certain renown to the Exhibition itself. To our Society belongs the honour to organize a Photographic Congress. I propose, therefore, that we name a permanent committee, which can discuss and enter into the views of local societies. La Société Photographique du Nord has already taken the initiative of forming an International Congress of Photography for 1889. The idea of this young Society was favourably received by the Comité Départemental du Nord. Le Commissaire Générale de l'Exposition expressed his approbation. At this point the forward movement of this above-mentioned Society completely ceased. They say that it is the duty of the Paris Committee to go forward and propose the programme of the subjects to be discussed at the Congress. They will willingly join with their colleagues of Paris.

"At the same time that the commission named by our Society prepare the way for the Congress, I propose that they consider the advisability to establish yearly meetings of the photographic community such as take place in England. The value of such Conventions has been amply proved. The Photographic Convention of the United Kingdom has just had a complete success at Glasgow. In the month of August, 1886, the first assembly of the Convention took place at Derby. Seventy members were present. At the second meeting of the Convention at Glasgow last month two hundred members responded to the appeal. During the seven days which the Convention lasted the evenings were devoted to the study of scientific subjects. A great number of papers were read and demonstrations given, apparatus and proofs exhibited, &c. The days were employed in making excursions in the environs under the direction of local members acquainted with the surrounding country. Numerous landscapes were taken as *souvenirs*. The local committee had made previous arrangements with the hotel keepers as to the price of board and lodgings, as well as the excursions. Every expense was foreseen. The happiest results have attended these fraternal meetings, and I see no reason why similar reunions should not be organized in France, and I hope that the Photographic Society of France will receive with due attention the proposition I have the honour to lay before them this evening."

The Chairman tendered his thanks to Professor Stebbing, and informed the members that the Belgian Society of Photography had taken the initiative of a Photographic Congress, and that the King of that country had taken a lively interest in the subject; that letters had been exchanged between every Photographic Society of Europe; in fact, that the subjects to be treated, especially relating to a standard light, had been discussed. He (the Chairman) did not think that the French Society of Photography could seize upon the laurels of the Belgian Society. Professor Stebbing made the remark that the idea of a Congress owed its birth to the Exhibition of Antwerp, and as it died with the close of that Exhibition, he did not see why the idea should not be revived, fructify, and bear fruit for the Paris Exhibition of 1889. Probably the Belgian Society would be but too happy to take part in and assist the Committee chosen by our Society. That, said the Chairman, would do away with every difficulty.

M. Arwin presented a half-plate camera adapted for tourists. From the body of the camera to the woodwork supporting the lens a black silk bag is attached. This part of the camera is set up very rapidly and is very light. A very short bellows joins the body of the camera to the focussing glass in order that, if required, different lenses may be employed. M. Arwin names this apparatus "*Le Polygraph*." This demonstration caused some acrimony and discussion among the cabinet makers present as to legal rights, &c.

M. Tondeur exhibited some negatives taken in the camera on gelatino-chloride plates; he employed the phrase, "the exposure is out of all proportion with gelatino-bromide plates." I failed to see the value of this presentation. I learnt that the exposure in the camera was five minutes! He said he got better results as to detail than if he had used gelatino-bromide plates with an exposure of one-twentieth of a second.

The most interesting subject of the evening then came on—a new and novel photo-engraving process invented and patented by M. Sartirana. Every one acquainted with copperplate engraving has seen or heard of the machine employed to plough parallel lines upon the surface of the metallic plate. These lines are regular, and of the same depth throughout; the cutter or plough being made so as to slide along the steel ruler. On the other hand every one who has dabbled in photography, especially in the Woodbury photo-printing process, knows that a prominent relief of a given image can be obtained in gelatine. We have here two instruments: First, a line-ploughing machine; second, a negative or positive in relief. M. Sartirana, in contemplating over the subject, came to the conclusion that the one could be adapted to the other so as to give birth to a new photo-printing process. This is how he operates in order to obtain an engraved plate. Upon a well-levelled table the cutting apparatus is placed, on one side of it is firmly fixed the photographic image in relief. Now, instead of the cutting plough being fixed to the steel ruler so that it cannot rise or fall when made to cut the ridge or groove upon the metal plate, this cutting plough is allowed to rise or fall; by this means the groove across the metal plate is not of a regular depth, as is absolutely necessary in the process for which it was invented. Now a mechanical mind can seize immediately the working of this new photo-engraving process, and I should not be surprised that it has been commercially worked long ago, seeing how simple and easy it can be worked. To the sliding apparatus which holds the cutting tool or plough is adapted a lever; at one end of this lever is fixed the cutting tool, at the other a stump tool in ivory. Everything being ready the operator draws

the sliding apparatus along the steel rule, the stump tool passing over the uneven surface of the gelatino-relief lifts or lowers the cutting tool, and the cut groove is a counterpart resemblance of the hills and valleys of the image in relief. Only the hills on the gelatine film form valleys on the engraved plate.

I send on to the office of THE BRITISH JOURNAL OF PHOTOGRAPHY a specimen proof printed off a block engraved by this process.

The Chairman informed the members that the next meeting of the Society would take place on the first Friday of November.

59, Rue des Batignolles, Paris.

PROF. E. STEBBING.

COPYRIGHT AND OWNERSHIP OF NEGATIVE.

To the EDITORS.

GENTLEMEN,—In the correspondence which has appeared in your columns on the portrait negative, in your issue of March 25, A. Debenham, of Ryde, I. W., writes, "It is usually taken for granted that a photographer's negatives form an important item in his assets," and in your issue of May 20 Mr. Basbe, of Sheffield, states: "Photographers go to a great expense in fitting up rooms on purpose for the care of negatives, which means a good sum of money yearly in rent, some of our large firms requiring a building for this purpose alone." These statements refer to the portrait negatives taken in the usual course of business. Again, I read in THE BRITISH JOURNAL OF PHOTOGRAPHY ALMANAC for 1882, in an article on copyright by Mr. Pearce, "It is only in accordance with common sense that a person who sits for a portrait should have some control over the multiplication of copies," and in a leading article in your issue of March 19, 1886, the writer says, "When an artist is paid for taking a portrait he has no moral right to use the negative for any purpose of his own. He has been paid for his work, and there is, or ought to be, an end to the transaction."

From these statements it is evident that there is a misconception by some photographers of the rights they possess to the portrait negative. For their benefit, perhaps, you will supplement the correspondence with extracts relative to this negative from an article explanatory of the Law of Copyright in Photography, and contributed to THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1869 by P. Le Neve Foster, M.A., Barrister-at-law and Secretary of the Society of Arts, a distinguished amateur photographer.

"For immediate disposal, a well-established photographic business in full working order, with dwelling-house, glass room, apparatus, &c., complete with five thousand first-class negatives."

"Such advertisements are constantly seen in our photographic journals, and yet I am inclined to think from conversations and correspondence I not unfrequently have had with photographers, that, simple as the transaction appears to be, both sellers and purchasers have no clear ideas of their rights as regards the negatives with which they are dealing. I propose to call attention to a few points which should be considered by both parties when engaged in such transactions as the above."

"As regards the second division of negatives, viz., those which the photographer has been employed to execute, they will include the general run of portrait negatives taken in the usual course of business. In every such instance, though the materials of which the negative is composed are the property of the photographer—that is to say, the glass and collodion film with the picture impressed upon it—yet the copyright becomes the property of the person on whose behalf it was taken 'for a good and valuable consideration,' and the photographer has no right whatever to print a single copy from any such negative, except by the order or license of the party on whose behalf it (the negative) was made. It would be such a breach of duty on the part of the photographic artist as would render him liable to all the penalties of the Act against pirates of copyright."

"And here it may be well to caution photographers generally, and particularly the purchasers of negatives, to be especially careful about the registration of copyright in any photograph. There is reason to believe that it is by no means unusual for photographic artists illegally to claim and register the copyrights in commissioned photographic works. This observation especially applies to portraits of celebrated persons. Nothing can be more improper or unjust; and in every case therefore, where the copyright to a negative is purchased, and especially from a photographer, it should be carefully ascertained that he really is the proprietor of the copyright. For that purpose, the registration at Stationers' Hall is worthless if it should turn out upon inquiry that the photograph registered was a commissioned work, and consequently, that the copyright originally vested in the employer and not in the photographer. Again, don't let a photographer imagine that because a negative lawfully remains in his possession, he can legally do what he likes with it. He may, it is true, if he like, clean the film from the glass and use it again, unless, indeed, he has, as is often the case, undertaken to supply subsequent copies at certain rates of charge. In this case, the question arises, How long is he bound to retain the negative on the glass for this purpose? The answer to this will depend on the circumstances of each instance, namely, the terms and conditions under which the negative was made. All that can be said generally is that, in the absence of any express stipulation to the contrary, the law would hold the photographer liable only to keep the negative for a reasonable time."

"In dealing with the Copyright question generally, it will facilitate arriving at a just conclusion always to bear in mind that the negative is

one thing and the copyright another. The two do not, upon the sale of a negative, necessarily pass together; that is, the sale of a negative does not transfer the copyright, and vice versa. In short, the negative and copyright are perfectly distinct; the right to use the negative, which is, in fact, the copyright, is the point never to be lost sight of, and which copyright, in the case of commissioned works, can only be acquired by the photographer under an agreement in writing, which must be followed by registration at Stationers' Hall, as previously stated.

"I may add that copyright is made personal estate by the Act; consequently, on the death of the proprietor, it vests in and may be dealt with by his executor or administrator, like any other personal property."

"The proprietorship of every copyright, and every assignment of it, must be registered at Stationers' Hall."—I am, yours, &c., J. F.

BACKING PLATES.

To the EDITORS.

GENTLEMEN,—Your amateur friends, and others who want a good backing for their plates to cure halation, need not go messing about with gum, glycerine, and ivory black.

A very good substitute may be found in Newman's *slow-drying* moist lampblack, which I have been in the habit of using for some time. A little squeezed out of the tube can be spread with the finger where required; and as I seldom take a view without a preliminary inspection, and a slight sketch in pocket-book to show where to back the negative, I do not find it at all necessary to smear the whole of the back of the plate.

Even when the preliminary inspection is not available, it is almost always sufficient in landscape work to cover the upper part (lower part in camera back) where the sky will probably come. And in church interiors a dab in the centre, where the East window is usually found, will answer nineteen times out of twenty. Perhaps, probably, the twentieth will be the most important of all; but I really don't feel equal to blacking the whole of the backs of all twenty plates, with the privilege of having to clean it all off. The colour easily wipes off with a damp cloth, and if it is objected that using the finger is a rather dirty job, there are two isimple remedies. The first is to use somebody else's finger, the credit of which suggestion is due to an eminent scientific gentleman, the late Sir Isaac Newton, who used a lady's finger as a tobacco stopper; but where that is not available, as in my case, one of the common indiarubber finger-stalls answers perfectly well.

I have not your article at hand to refer to, but think you recommend this as a more perfect backing than asphaltum. My experience is the other way; and in any very difficult case, I prefer a solution of asphaltum, or what I suppose is such, sold by Hopkin & Williams under the name of liquid jet. It is very cheap, dries in a few minutes, and is easily removed with a little benzole or chloroform. Of course, this would be a horrid job if all over the plate; but it is only in the case of bad east windows, or such-like, whose position is known, that I use it. This jet was recommended in one of the JOURNALS or ALMANACS many years ago, and I have used it ever since; but these sort of things seem forgotten and resurrected periodically.

R. SEDGFIELD.

Norbiton, August 6, 1887.

To the EDITORS.

GENTLEMEN,—I have read with much pleasure your remarks on *The Best Mode of Backing Plates*, and would like very much to adopt the method you recommend, but I am afraid of my dark room. Like many other amateurs, I do not possess a room set apart and fitted up for the purpose, but am obliged to be content with one which is generally used for other purposes, and although it suits very well for development (by taking care that the plate is covered as much as possible) I am sure that the exposure of plates in it sufficiently long to coat and dry would result in fog worse than the halation to be cured.

Can any of our dry plate makers come to the rescue? In their manufacturing fitted up with every mechanical appliance and perfect immunity from light, backing plates after coating would entail very little extra trouble. I am sure one or two shillings per dozen extra would pay the makers, and their issue would be much appreciated by many others who work under the same conditions as—Yours, &c., B. Sc.

Plymouth.

FIFTY SITTINGS FOR A PORTRAIT.

To the EDITORS.

GENTLEMEN,—In your issue of July 22 I put the question to Mr. R. Barrett, "In what way a portrait painter may avoid or shorten the sittings nowadays?" as alleged by him in an article headed *Colouring as Applied to Photography*. As there appeared no reply, I presume that it is a somewhat difficult task to answer the question, and in the interest of the photographic art, as well as of the art of painting, I consider myself justified in contradicting the opinion of Mr. Barrett, and to say that a portrait painter cannot receive any assistance by aid of photography. A painter is bound to study with his own eyes the forms in combination with the many different shades of colours, and the transparent individuality of the skin, &c., to obtain a resemblance of nature in

his picture. All painting done in another way can only be an imitation, and without any value relative to art. From this point it is also easily understood that a photograph may have and has value by itself, but cannot be improved by retouching, though it may be a trick to please uneducated eyes. It would be the same thing if one would carefully take out all the strokes of the brush visible in a painting, and making a very smooth surface all over, but surely spoiling the peculiarity of the original.—I am, yours, &c.,
A PAINTER.

Liverpool, August 8, 1887.

[Our correspondent is quite mistaken in saying that painters receive no assistance in their works from photographs. We know of innumerable instances to the contrary.—Eds.]

TITLES ON NEGATIVES.

To the EDITORS.

GENTLEMEN,—Referring to the answer you gave "Perplexed" in last week's issue, may I venture to suggest that an easy method of printing titles into photographs is to write them on vaselined tissue-paper in some thickly mixed non-actinic colour, and then simply to reverse them on the negative?—I am, yours, &c.,
C. B. VANDELEUR.

Curragh Camp, Ireland, August 4, 1887.

FRILLING.

To the EDITORS.

GENTLEMEN,—I should be glad if you would tell me what to do when in the middle of developing, &c., a lot of negatives they all unexpectedly start frilling; some even come off the plate in a mass of film.—I am, yours, &c.,
W. PEACOCK.

[See leading article.—Eds.]

Exchange Column.

I will exchange a stereoscopic camera, twin lenses, London make, for a half-plate set.—Address, W. SAUNDERS, Dickleburgh, Scole.

Wanted, oak studio table in exchange for pillared balustrade with leuvre pedestal.—Address, T. COUPE, 39, Banktop, Blackburn, Lancashire.

Will exchange half-plate camera stand for eight film carriers, half-plate size, or lesser number and difference in cash.—Address, A. LINDLE, 69, New North-road, London, N.

Wanted, a few lessons in solar enlargement and carbon printing on opal by an amateur Indian, in exchange for a set of thirty best Indian views and costumes.—Address, A. H. T., 13, Colville-gardens, W.

Will exchange a compound lantern condenser, also a quarter-plate portrait lens screwing into a brass tube for lantern, for a rolling press or a lantern-view or quarter-plate camera of very long focus, and with some double dark slides.—Address, K., 23, Chancer-road, Herne-hill, London.

Answers to Correspondents.

J. W. RAMSDEN.—Received. The slide is being tested.

W. R. McDOWALL.—Thanks for the enclosures. The invention seems practicable.

W. D.—Messrs. Marion & Co. will supply the brass rims in any quantity you may require.

THE MOUNT (Aekworth).—You had better interpose blotting paper between the vulcanised pad and the sensitive paper in future. No doubt those prints which showed evidence of discolouration were longer in contact with the indiarubber than the others.

J. FAWORTH.—Without you take advantage of orthochromatic photography you will not succeed in getting a better copy of the picture. We know the picture well, and can therefore say positively that nothing better than the example sent can be obtained except by the means indicated.

LANTERNIST.—The Art Union print is copyright, and you will infringe it by reproducing the picture as a lantern slide. It is quite possible that the proprietors may give you permission to copy it as a lantern slide, though it is scarcely probable that they will. Write to them and ask the question.

B. M.—The system is a bad one, yet it prevails, though, we hope, not to the extent you surmise. Most operators, particularly those of the better class, are above that sort of thing. We cannot publish your letter under a *nom de plume* or under your signature in its present form. It would be a libel on a very honourable body.

S. A. H.—We are not surprised at the reply received. Those who work any of the different photo-mechanical processes as a business will not impart the whole of the knowledge they have acquired by practice and careful study without a substantial consideration. Why should they? With them it is simply a matter of business, and not a hobby.

SHIPPERS.—1. If the operations were carefully carried out there should be neither brown stains or white spots. They evidently proceed from faulty manipulation.—2. The lens has nothing whatever to do with either the thinness or the density of the image, that rests with the exposure and development.—3. The iris diaphragm is about as good as any other.

COL. GUBBINS, R.A.—The kind of level described can be obtained at most mathematical instrument makers or at the better class of tool makers. They are not, however, considered so good as the ordinary spirit level. The "Eastman strippers" are supplied by the Eastman Company, 13, Soho-square, W. Write to them direct if you fail to obtain a supply otherwise.

H. R. H. writes: "Will you please tell me, in your 'Answers to Correspondents,' what is the best mountant to use for mounting photographs face down on glass, as I find starch is not suitable for my purpose, namely, making medallions?"—The most suitable material for the purpose is gelatine, and the best kind to use is that mentioned in a sub-leader, namely, Nelson's "No. 2 Soluble."

B. C. C. asks: "What is the cause of opaqueness of negative after ammonia development, and a sort of milky appearance of the print from the same negative after toning?"—Without seeing the negative it is impossible to say the cause of the opalescence. The negative being defective fully accounts for the prints being defective also. Unless the negative be perfect it is impossible to obtain perfect prints therefrom.

R. B. Y. wishes to know how large pictures on paper with a rough surface like that of drawing paper are produced. He says he has seen some which appear very suitable for finishing in crayons, and he would like to try his hand in that direction.—Pictures on rough paper are produced either by the carbon process or by the gelatino-bromide process. Those who supply either class of picture will furnish our correspondent with what he requires.

A. G. wishes to know the reason why the sides of a street view are so much sharper than the sides of a landscape taken with a lens under similar conditions in both cases.—In reply: The lens projects its image on a curved field, and as the sides of the street view are much nearer the lens than the centre of the subject, it follows that there is an elongation of the marginal lines sufficient, by the law of conjugate foci, to project the image on a flat field, which is not the case with the sides of the landscape.

C. BANYARD writes:—"Will you kindly tell me how I can alter a French lens that I have? It throws a good sharp picture on focussing glass, but when taken the picture seems out of focus, but seems to improve the smaller stop I use."—In reply: The lens is over or under corrected, probably the former. If a portrait combination, test the front lens for the fault, and if it prove to be the delinquent, alter by regrinding the contact surfaces to another curve, if you can; but if you cannot, then place it in the hands of a competent lens grinder. The simplest way to utilise the lens is to ascertain the difference between the visual and chemical foci, and rack the lens in or out accordingly.

ETHEL CONSTANCE MAY (Bad Wildungen, Germany).—We are not conscious of the receipt of any previous letter. We do not know the address of the maker of Perron's dark slide, nor whether it is yet an article of commerce. It is, we believe, the same slide that was described in our issue of April 15 (page 238) by our able French correspondent, Professor Stebbing, as having been exhibited at a meeting of the French Photographic Society. So that you will perceive it *was* noticed in our pages anterior to the other publication to which you refer. It is probable that a note addressed to Professor Stebbing will ensure those particulars you desire to know, but of which we are ignorant.

F. W. BRET asks: "What is the cause of the denser parts of a negative when dry having a raised appearance in proportion to their density, and on the shadows a kind of crystalline deposit? The plate was developed with the sodic-potash developer (page 144 of the ALMANAC for 1887), and cleared in a bath of citric acid, sulphate of iron, and alum. I developed two plates at the same time, but only one of the negatives showed this defect. Any suggestions with a view to remedying this will be much esteemed."—The denser portions of a negative have usually a higher relief than the thinner ones, but the crystalline deposit on the shadows is due to imperfect washing; the salts which ought to have been washed out have crystallised on the surface. The reason why one of the negatives shows it and the other does not is that the washing was more complete in the one case than in the other.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, August 17, 1887, will be on *Organizing Photographic Outings*, Saturday outing at Pinner. Trains every half-hour.

FROM Mr. F. K. Hurman, Ryton-on-Tyne, we have received a graphic programme of a picnic, produced at his own expense by the president of a local club, and presented to the members to the number of a hundred and sixty, the President being an enthusiastic amateur photographer. It contains several portraits, groups, and scenes printed in platinotype.

NOTICE.

WITH our issue of to-day we present a group of some of those members who went to Tarbert on the occasion of one of the numerous excursions indulged in during the week of the Photographic Convention of the United Kingdom. Owing to the strength of the temptation presented by ruined castles, fishing villages, and charming scenery in general, only a limited number of the excursionists were present when Mr. Stuart erected his camera, but for all that the group comprises several men of mark. We shall furnish a key next week.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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SOAKING PLATES BEFORE DEVELOPMENT.

A CORRESPONDENT calls attention in another column to what he considers a discrepancy between his own practice and the experience of others who have written on the subject, inasmuch as he has found, contrary to published statements which he has had previous reason to doubt, that a preliminary soaking in plain water before development causes the plate to develop more rapidly than if the developer be applied directly to the dried film. Whether such is or is not the case, and where our correspondent has probably been led astray, we shall attempt to show.

In the earlier days of gelatine plates, following no doubt upon the practice which prevailed in connection with *collodion* dry plates, it was considered necessary, and it was the universal custom, to prepare the dry surface of the gelatine to receive the developer by soaking it for a minute or two in water. In the old dry collodion days this was undoubtedly a very necessary precaution, as could readily be demonstrated; indeed, the mere wetting with water was in itself insufficient to restore to the dried film the requisite degree of porosity to enable the developer to penetrate it. A first application of alcohol, more or less dilute, was needful to soften the horny skin of collodion enveloping the particles of sensitive material, and almost entirely protecting them from the action of the aqueous developer to which it was nearly impervious. The alcohol, however, exercises a certain penetrating power, causing the collodion film to swell and open its pores, thus giving free access to the aqueous solution by displacement.

In order to demonstrate not merely the utility but the absolute necessity of this preliminary treatment with alcohol, it is only necessary to take a dry collodion plate possessing a moderately horny film, and, after exposure, to treat only a portion of the surface with alcohol, washing the latter away thoroughly before commencing to develop. Upon development it will be found that while the portion treated with alcohol gives a dense and satisfactory image, the other not only develops slowly, but will give nothing but a feeble, miserable, and foggy image, however long the operation may be continued. The fact is the collodion is so impenetrable to water, and so thoroughly protects the particles of bromide from the action of the developer, that only a comparatively small number of them come under its influence, and those mainly the coarser particles which lend most to the production of fog. We are speaking now principally of dry films prepared with organifiers of but slight viscosity, such as tannin, for where such substances as gum or gelatine are employed they partially fill the pores of the wet collodion film and enable it to swell and regain some of its porosity in water alone. Still,

even these latter are better for the use of alcohol. The more modern collodion emulsion plates possess films which are naturally more porous and penetrable to water, and may, consequently, sometimes be developed without alcohol, though the results are nearly certain to be inferior.

When we turn to gelatine plates the absolute necessity for this preliminary soaking is not so obvious. Gelatine, though insoluble in water at the ordinary temperature, absorbs it with the greatest avidity, and therefore the developer, being aqueous, of course requires nothing to prepare the way for it into the film. In fact, the surest way of getting the solution quickly right to the back of the film is to apply it to the dry surface, for then it is rapidly sucked up by the gelatine instead of more slowly finding its way in by displacing the water already absorbed. Still, as we have said, it was the early practice to resort to this first soaking in water which, under certain circumstances even now, as then, may have its advantages. In developing film or paper negatives and prints, for instance, the preliminary soak in water is given not so much as affecting the sensitive film, but because it softens the negative and makes it lie flat, so conducing to ease and regularity of development.

We have just said that the soaking in water may, under some circumstances, prove beneficial, and we may at once explain that those conditions are mainly connected with the condition and quality of the emulsion or film. The benefits derived may be not only acceleration of development as described by our correspondent of this week, but may actually result in the removal of fog. In every such instance, however, we should set the effect down to a faulty emulsion in the first place.

If a perfect film be taken—that is, one consisting only of pure silver haloids and undecomposed gelatine—the effect of the preliminary soaking can be readily demonstrated by the very simple experiment of soaking only a portion of the plate for, say, two minutes, and then plunging the whole into the mixed developer. As a fact readily verified, and not as a “disputed point in development,” the result may be stated as follows:—The image will commence to develop first upon the unsoaked portion of the film, and will gain some strength and detail before the remaining part shows any sign. As the application is continued, the image on the unsoaked portion gradually makes its appearance, and as it progresses slowly overtakes the first, and when the development has been carried as far as possible there will be little difference between the two halves when the negative is viewed by transmitted light, though, with most plates, there will be a slightly noticeable difference on looking at the surface. In fact, the unsoaked parts of the

film appear to commence vigorously, the energy dying away as development proceeds, while, in the portions that have received the preliminary soaking, the action is slower in commencing and proceeds more gradually, and without falling away so rapidly. There is little, if any, difference in the amount of detail or the density ultimately attained, the effect being merely started and completed more rapidly in the one case than in the other.

It might be supposed that the additional energy exhibited by the dry portion of the film would be sustained throughout the operation, and that the ultimate result would prove beneficial so far as apparent exposure is concerned; but against that supposition, and to account for the rapid waning of the action of the developer, one or two points are worthy of consideration. It is well known that a strong developer acts not only more rapidly, but also gives greater vigour, and possesses a stronger power of searching out detail than a feeble one; the soaked portion of the film under the circumstances of the experiment is virtually subjected by the action of a weaker developer, since the solution is diluted by the water already absorbed by that part of the film. This, taken in conjunction with the slower penetration of the developer, owing to its having to displace the water already absorbed, is sufficient to account for the extra initial energy of the dry portion of the plate.

But as the image develops, the bromine liberated from the reduced silver haloid enters into combination with the alkali of the developer, and though the dry film is first attacked by a comparatively stronger developer than the already moist portion, it is rapidly placed under the influence of a solution feebler in alkali and more strongly restrained, and so the superior energy of the first onset suffices in the end to counter-balance the apparent promise of greater developing effect. With most plates, as we have said, there is little to choose between the final results whether the film be soaked or not, but occasionally, from some peculiarity in preparation, a distinct difference is noticeable in the printing qualities of the negatives, and not unfrequently the advantage is slightly in favour of soaking, though invariably the action is slower.

So far we have spoken of perfect plates; but should the films be not necessarily downright bad, but contain traces of free bromide or of nitrates imperfectly removed in washing the emulsion, it is quite possible to conceive that the preliminary soaking may slightly accelerate the development. We need not point out that as bromide is a restrainer its removal from the film before applying the developer is equivalent to employing so much less restrainer, and it is pretty well known also that the soluble nitrates act to a certain extent as restrainers and that the same remark applies equally to their elimination. But it is difficult to believe that the removal of such small quantities of either as are likely to be present in dry plates—commercial ones at any rate—of the present day would suffice to neutralise the retarding influence set up by the act of saturating the gelatine film with water.

Then, again, partly decomposed gelatine, as well as salicylic acid and similar substances added to the emulsion to prevent decomposition, have a marked action in retarding the action of the developer. In the early days of gelatine plates, when "soft" gelatines, prolonged digestion, and antiseptics were in vogue, it is possible that the practice of soaking the plate before applying the mixed developer was of use.

It may also prove beneficial under extraordinary circumstances, as when plates have been kept for a considerable time,

especially in a hot climate, and the films have become particularly hard. Gelatine under such conditions absorbs water but slowly, and not always with uniformity, for which reasons the preparation and equalisation of the film by the preliminary soaking would form a distinct advantage. Similarly, if the plates have been subjected to moisture and have redried, the chances of inequality and uncertainty may be removed by similar means.

Just one other instance, which, however, is not likely to arise with commercial plates, may be mentioned to show that the soaking may prove of very decided advantage. Some years ago we prepared a number of plates by a formula in which an excess of silver figured, the excess having evidently not been thoroughly removed in washing. These plates up to a certain age gave perfectly satisfactory results when soaked before development, but would not at all stand the direct application of either alkaline pyro or ferrous oxalate to the dry film. In the course of time they became perfectly useless from decomposition.

Returning to our correspondent's letter, we can put but one construction on his results, and we have little doubt as to the correctness of our surmise. The plates being, as he states, of his own manufacture and a slight modification of his ordinary formula—perhaps a larger excess of soluble haloid than usual—have been insufficiently washed, hence the results detailed. They must have been a pretty bad case of imperfect washing, however, to behave in so noticeable a manner. There is little ground to go upon, so far as we are aware, in attributing to iodide of silver any special influence in the direction suggested. A soluble iodide might retard development, but beyond causing the films to fix slowly a properly washed iodide plate could have no further peculiarities.

SIZE AND PROPORTIONS IN PORTRAIT ENLARGEMENTS.

ONE of the most important features in a picture, a portrait in particular, is its proportions. Although painters are exceedingly particular in this respect, many photographers appear to disregard it altogether; hence pictures otherwise good are frequently ruined, simply from lack of judgment on this very important point. With portraits of small dimensions the matter is, of course, equally as important as it is with large ones, though it must be admitted it may be less conspicuous in the one case than it is in the other. Shortcomings in this direction, which might pass comparatively unnoticed by the majority of persons in a small picture, would be conspicuous in an enlargement therefrom if the same proportions were retained.

Take, for example, the cabinet picture which, as usually trimmed, measures something like five and a half inches by four, or a little more. Now these proportions are about as good as can be for busts or for three-quarter length sitting figures, and are, as nearly as may be, those which have been adopted, for similar subjects, by most of our great portrait painters for their works. But when a three-quarter or a full-length standing figure is taken cabinet size, most people have noticed how much better the picture would have looked had less background been shown on each side of the figure—particularly is this the case with portraits of gentlemen.

Again, take the *carte-de-visite*, promenade, and panel sizes—how very unsuitable are these for some subjects; and necessarily they must be, for those proportions which are best adapted to

a full-length standing figure are manifestly not good for a head and bust. However, the above are all standard sizes, and photographers are compelled to adopt them. The sitter demands a certain style of portrait, of any of these particular sizes; the artist, having no option in the matter, supplies it as a matter of business—sometimes, however, under a mild sort of protest.

As we have just said, photographers have little, if any, discretion left them in pictures of the smaller and recognised standard sizes and shapes, but this is not the case with enlargements, as in these they have some scope to use their own judgment. Sometimes by altering the proportions of a picture, or by the introduction of a little more, or maybe rather less, of the background at the sides of the figure, a considerable improvement on the original may be effected. Very frequently this may be done by introducing more or less of the figure itself.

The photographer who makes his own enlargements can always judge, by looking at the amplified image in the enlarging apparatus, the effect that different proportions have upon the picture. Therefore he can easily decide the amount of subject which, according to his judgment, it is desirable to introduce, and also the best proportions or shape of the picture. This is not the case, however, when the work is sent out to be executed, and very often the enlarger has no discretion left to him in the matter. Moreover, the order is frequently despatched without any consideration on the part of the sender as to whether the proportions of the small picture bear any relation whatever to those of the one demanded.

Let us instance the *carte* and cabinet sizes; in these the proportions are widely different. If the latter be enlarged to, say, a very popular size—twenty-four inches by eighteen—the enlargement will contain about the same amount of subject as the small picture. But not so in the case of the *carte-de-visite*. If the subject in the latter, vertically, be made to measure the twenty-four inches, laterally it will only be about fifteen inches. If, however, the subject be made to cover the full width of the paper, some of the figure, or the background above the head, must of necessity be omitted, and that not always to the improvement of the finished picture.

It is, we believe, customary with professional enlargers, unless they are instructed to the contrary, to make the subject, whatever it may be, cover the full size ordered, so that no blank paper is shown. The intention doubtless is, that as a certain size has been ordered the whole of the paper must be covered; hence many which would otherwise have been good pictures are utterly spoilt. It is true that, in some instances, much may afterwards be done to mitigate the evil by cutting off certain portions in the framing, but this, too, is frequently neglected.

There is another important point in connection with proportions in enlargements which is very often overlooked, namely, the relation of background to figure. We have before us just now a small portrait of a lady and an enlargement made therefrom. The former is satisfactory and the latter the reverse. The sitter, it may be explained, is somewhat below the average height, and the small picture conveys a very good idea of the stature. But in the enlargement the operator, probably with the view of covering the whole of the paper laterally, has introduced so much figure, and has left so little background above the head, that it gives one the impression that the sitter must have been little short of a giantess. While the small picture has a refined appearance, the enlargement is inartistic, not to say vulgar, in the extreme. Of course this might have

been avoided had the photographer, at the time the enlarged picture was ordered, sent the original print as a guide to the operator, with instructions to make the enlargement of the same proportions.

It is a very simple thing for the artist to take an impression the full size of the negative, which usually includes more subject than is required, and then to trim or mask it down until those proportions which produce the most artistic effect are secured, afterwards sending that as a guide to the enlarger. Although photographers are restricted to certain proportions in their small pictures, they are not necessarily so in enlargements, and here many will do well to use a greater amount of discretion than apparently they do at present.

THIS morning (19th) will have occurred an eclipse of the sun, only partially visible in this country, and at an inconvenient hour for popular observation. Seeing that the sun would rise at seven minutes to five, the eclipse be over at six minutes past five, and that only a small portion of the disc would be invisible, it is not likely that any of our readers will have attempted photographic snap-shots at the phenomenon. But enthusiastic *savants* never willingly let slip any such opportunity of adding to the limited sum of knowledge obtainable only on such occasions, and expeditions have been arranged for observing and photographing the eclipse under the most favourable conditions. The belt of totality passes over Europe and across Siberia, which latter country was selected by the parties of observation on account of the eclipse there occurring at an hour when it would be free from the effects of earth vapours. Our esteemed contributor, Father Perry, left some time since *en route* for Siberia, and we learn from the newspapers that, on account of his being a Jesuit, special permission had to be obtained before he could even enter Russia.

MR. W. H. PICKERING, of Boston, Mass., communicates some interesting data to *Science* as to his photographic experience at Grenada last year, where he went to photograph the total eclipse. He states that the inner corona was satisfactorily shown with one or two seconds' exposure, on rapid gelatine plates, with an ordinary telescope lens. With a photographic portrait lens of about f aperture, the same exposure enabled the outer corona to be satisfactorily shown to a distance of about half a degree from the limb of the moon. Beyond that distance the photographic power of the coronal light rapidly diminished, and exposures of from eight to forty seconds were needed.

IN estimating the intensity of the light of a gas burner, the term candle power (abbreviated to "c.p.") is of well-known use. It means a light equal to that given by the same number of candles, of a particular make and size, as the figure attached to the c.p. It is a very easy matter for any one to test for himself the power of a gas burner in this manner; but in the case of the electric light the difficulties are far greater, and the reputed power given to it by the manufacturer is usually accepted as a correct designation. But it has lately been shown by Professor Henry Morton, of the Stevens' Institute of Technology in the City of New York, that the best of a large number of so-called 2000 candle-power lights gave only 800 candle power. He assumes that the term "2000 candle power" has become a technical expression with the electric light companies to denote a lamp of from 500 to 1000 actual candle power." Hence those photographers who in arranging for an electric installation may be inclined to found estimates on reputed power, will need from three to four times the amount of light they would calculate upon!

WE have on a previous occasion spoken of the chloride of iron cell improved immensely in constancy by the addition of bromine as a recuperator of the chloride reduced in action to the ferrous condition. The expense of bromine is an objection to its use, but in the current number of the *Chemical News* Mr. Thomas Mowse states that the bromine may without injury be replaced by a mixture of a few

crystals of chlorate of potash and a little hydrochloric acid, to which a small quantity of bromine is added. The same writer states that permanganate of potash is an excellent depolariser, and that an exceedingly compact and handy little battery, especially suited for intermittent currents, electric bells, &c., is made by placing a carbon and zinc plate in a strong solution of this salt and chloride of ammonium. As there are few studios in the country without a Leclanché battery in use for bells, &c., our readers may easily try this substitute for themselves. The same writer states that the familiar Leclanché cell employed almost universally for these purposes may be regenerated to a great extent by pouring into the porous cell a strong, warm, and slightly acid, solution of the permanganate.

It has been generally thought that since the introduction of gelatine plates the productions of photographs of minute objects by means of the microscope had attained increased excellence, beyond and in addition to, an undoubted wider range of subjects; but Dr. Klein, whose authority on such matters is indisputable, besides having recently written* that, "taking photography as a whole, as applied to the representation of microscopic objects under high powers, I think that the time has not yet come when it can be said to have supplanted good and accurate drawings," has also stated "there can be little doubt that no real advance has yet been made in producing photograms that are to take the place of accurate drawings." Of course a drawing will always have the advantage over a photograph in that all planes can be depicted at once with equal sharpness; but it is clear that this effect is not alluded to in Dr. Klein's sweeping criticism, for he goes on to say "with the new apochromatic objectives and projection eye-pieces by Zeiss, better results may be looked for," clearly showing that it is technical excellence that he deems still wanting.

A COMPARATIVELY large number of photographs taken from the cars of balloons have been published at various times, and a still larger number attempted unsuccessfully to be secured. It is well known that one of the great difficulties met with in this kind of work is the rotatory motion of the balloon, and this has militated considerably against the successful experimental employment of stationary balloons holding photographic apparatus for military observation. In a recent number of *Nature*, however, an exceedingly ingenious arrangement (which has been tried with success) is described for giving steadiness to a balloon held by a rope so as to avoid, to a great extent, the usual jerks, oscillations, and rotations. The balloon is provided with an extra cover which acts somewhat as a kite (hence the descriptive term kite balloon, given to the invention), and not only is the objectionable character of the motion removed, but, instead of being depressed under the action of a high wind the altitude of the balloon is actually increased. This invention, if carried out by the military authorities, ought to render invaluable service by means of a camera actuated from below by means of electricity.

ECHOES FROM THE SOCIETIES.

"It was a pity that the question of amateur and professional had ever been raised," Mr. W. E. Debenham is reported to have said at the London and Provincial Photographic Association; "before it was recently raised photographers had always been working amicably together." Mr. Debenham is quite right, but there is some consolation in the fact that the best of both amateurs and professionals are still working amicably together, as witness the recent Convention. It is only the Ramsgate beach peripatetic and the "two-guinea-set man," as somebody recently described him, who in their respective classes are dissatisfied with themselves and the photographic world in general—the former chiefly, perhaps.

Appropos of the question that led to this remark, it is most certainly an anomaly that the sole exhibition open to "amateurs" only should be "run" by and in the interests of a trade concern. It is still more incongruous that the productions of such amateurs are exhibited, for sale presumably, in the shop window of the said concern.

The latest novelty in Society matters is the idea of a portrait group

* *Nature*, page 317, August 4, 1887.

of the members of the year. Such at least is what I hear is the intention of the Sheffield Society, and active measures are on foot to obtain the necessary portraits, to be subsequently joined together in one harmonious whole. If it is intended that this be an annual affair I think it would be wise on the part of the "Sheffield blades" if they consulted with Mr. Lachlan McLachlan on the subject. He would, perhaps, tell them that a similar picture cost him years of labour, and brought little but worry when finished.

Another new idea hails from the North Surrey Society, where its advantages were demonstrated a short time ago. This is no less than a "self-adhesive mount," a card, in fact, which combines in itself the support and the mountant. All you have to do is to place the print on the mount, press them together, and, lo! the thing is done, the picture is mounted. We only want now to make our printing arrangements complete a ready sensitised paper which, when placed behind a negative in the sun or diffused light, will be printed, toned, fixed, and *trianed*—I really must insist on the latter, or the two-guinea-set man would not consider it "scientific" enough.

That brings me round to another "grumble" I have been going to indulge in for some time, but have refrained. Every reader of the JOURNALS must have noticed it, but to me, who am condemned to carefully read, mark, learn, and inwardly digest the reports of Society meetings, it is absolutely painful. I allude to the fact that our meetings now are little better than localised advertising centres; the business of the evening consists, in nine cases out of ten—or, perhaps, I should say the *report* consists—of an account of the exhibition of Mr. Jones's new camera, prints from Messrs. Ananias's "two and a half million times" plates ("which were generally considered to be really rapid"), and Mr. Somebody Else's new patent shutter, working in the two-thousandth part of a second, and in which the otherwise fatal "recoil" is diverted and ingeniously utilised in packing up the camera when the exposure is made. If a paper is read and a discussion follows, the reporter either "hashes" or suppresses it, and then has to fill out with the "padding" of the meeting in order to make up the space his Society expects to see devoted to its reports.

Things used not to be thus; the reports of Societies dealt with the scientific and practical matters that cropped up at the meetings. If Mr. Ananias enlarged upon the rapidity of his plates, and Mr. Munchausen, jun., described how he had obtained forty perfect negatives on three dozen of them, the Secretary of the Fibtown Photographic Association had the common sense to suspect, if he were not sure, that similar things had been said previously elsewhere, and that therefore to report them as novelties would only show how far behind the rest of the world the "Fibbers" were.

Seriously, I have no objection to Mr. Jones exhibiting his new camera if he has got one and is proud of it, but I do object to his getting it a paragraph advertisement in the report as an act of gratitude, perhaps for an extra five per cent. discount. The exhibition of novelties is, undoubtedly, one of the most legitimate portions of the evening's proceedings, but in reporting the meeting the Secretary should remember that what may be new and interesting in some far-off corner of the provinces may be "old as the hills" in the chief centres of the country. The rest of the photographic world are little interested in such details, but would gladly read a more extended report of an important and practical paper or discussion. If there be none such then let the reporter be content to economise space.

While on the subject of reports I would allude to another practice which seems to be gaining, that is, the reporting of opinions, perhaps thoughtlessly and lightly expressed with no idea of their going further, on purely trade matters. In this case the statement goes forth to the world—unintentioned though it may have been originally—with the sanction and authority of the Society attached to it, and much harm and injustice be done or, on the other hand, undeserved praise awarded.

As an instance of what I mean, two or three weeks ago at a provincial meeting two gentlemen "wished to lodge a complaint" against a commercial firm—I abstain from repeating names—because they had not been served as they thought they ought to be. Now I hold that their duty was to complain at headquarters, to the firm itself, and not to creep under the wing of the Society and thence hurl a bolt with fictitious force. Nobody can prevent their complaining in private of wrongs, supposed or real, nor even their mentioning in an informal

manner across the meeting table, but here again the fault lies with the reporter. It is not the function of any Society to act the part of judge and jury, trying and deciding a case after hearing only one side and with little chance of appeal. This is practically what they do, for what can be known of the facts of the case except what the complaining party chooses to lay before them. It seems to me an unfair attempt on the part of individuals to make the Society take up their private grievances, and Societies should, I think, fight against the system. The instance I mention is only one—a flagrant one I own—among many I could point out within the past few weeks.

Not quite coming under this head, but still an attempt to get the Society to fortify him with an expression of opinion, was Mr. Debenham's question with regard to the illustration in the last number of the Society's *Journal*. The Society had accepted an illustration printed by a commercial firm (I do not wish to advertise them), who appended to it their own trade description, which includes the word "permanent." Mr. Debenham wishes to know whether the permanence of the prints in question is established by the Society's statement to that effect—in other words, whether the Society intends to guarantee their permanency. The Honorary Secretary perhaps went a little beyond his functions in saying that the matter was a "slip," for having accepted the picture they were compelled to allow its producers to describe it by its recognised trade name, and in doing so accepted no responsibility whatever in the matter. Such, at least, is my reading of the matter. At any rate, on the facts as stated, Mr. Debenham could scarcely expect the Society to express an opinion on the much-disputed question of permanence.

I am not sure that it was not Mr. Edwin Cocking who was the first, or one of the first, to assist in discovering the effect of ammonia fumes in producing chronic nasal catarrh. Now he has discovered another photographic ailment, this time amounting to a decided "obliquity of vision." Negatives sharply focussed upon the ground-glass proved blurred and indistinct when developed, and, curiously enough, this only occurred in negatives taken at midday, not at night. It was suggested that "heat had a physiological effect on some persons, causing them to see less perfectly in the middle of a hot day than in the evening." If the time of the appearance of the phenomena were not as it is, and did I not know my old friend Cocking so well, I should perhaps have set it down to something besides "heat." However, I trust he may long retain the full use of his eyes as well as his "dose" to help us with our annual exhibition.

It is not often Nemesis turns up so quickly as in Mr. Higgins's case not long since at the North London Society. Exhibiting two double slides, whose chief advantages appeared to be that they had cost 6s. and 7s. respectively, the Honorary Secretary cruelly "rounded" on him, showing how useless they were for photographic purposes, by pushing two sheets of note-paper into them while closed!

MONITOR.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

I THINK it may safely be conceded that a photograph even perfect as regards its mechanical and chemical qualities, may still be very imperfect as a work of art. The cure for this, more especially as regards portraiture, may be found in the judicious and skilful application of colour. It may have been most skilfully produced, every attention being paid to artistic *posing*, careful distribution of light and shade, and all other details, and may be fairly entitled to be called a *picture*, and a successful one, but yet as a *portrait* it may be most imperfect and untrue, many cases existing, owing to the chemical peculiarities of photography, where colour is absolutely indispensable to secure anything like a true or faithful resemblance to the original.

The manipulatory skill which enables one to imitate with more or less success the colours of a human head is not the only factor in producing successful results in painting. There is a primary knowledge, without which there will always be a weakness about our effects, and that is a knowledge of the natural value of colours. In studying the art of colouring our first efforts should be directed to gaining a thorough knowledge of the various relations and harmonies of colours, their many effects either in combination or juxtaposition.

We have rather a limited number of colours to start from, but

* Continued from page 501.

there is an almost endless variety to be produced from them. The primary colours are only *three* in number, but I cannot say how many various tints can be produced from their skilful blending. And this is not all, for in a picture many of the beauties will be traceable not to the tint itself so much as the harmony produced by the combinations of such colours and tints as mutually lend a charm. The endless variety of colours will be more observable in landscape than any other, and in fanciful or imaginative portraiture than in portraiture where nature pure and simple has to be imitated. Photographic colouring naturally gives the least scope of all, and yet it is marvellous the difference between the work of an ordinary photographic colourist who has never thoroughly studied the balance of colour, &c., and one who has acquired a thorough knowledge of the principles of harmonious colouring. The work of one is valueless, while the other shows that it is an adverse fortune that compels the artist to work within such cramped lines.

In portraiture, when we are a little free as to our treatment, there are many points which we must faithfully reproduce as far as possible. The most important being the colours which are represented on the model itself, we may almost consider ourselves free as to the choice of colours for the draperies, backgrounds, &c. This freedom is of very great value to the portrait painter, as by the skilful arrangement of such colours as will enhance the value and beauty of his complexions and still produce a harmonious whole, even an appearance of transparency may be secured under these conditions that with less freedom could never be hoped for.

Light is the source of all colour; without it there is none. A beam of white light may be divided into three distinct rays of different colours—red, blue, and yellow, these being the three *primary colours*, by the careful mixing together of which every conceivable hue and tone can be obtained.

White light, when decomposed by passing through a prism, produces a most beautiful effect of varied colours, which is called the *solar spectrum*. In this there are seven colours, the same as are to be seen in a rainbow, namely, violet, indigo, blue, green, yellow, orange, and red. At one time this led to the belief that they each and all were elemental colours. Later and closer observation, however, showed the mistake, proving that red, blue, and yellow were really the *only primaries*, the others being simply the result of these overlapping each other, and so producing a distinct colour, as would their mixing on a pallet.

The happy disposition of the three primary colours and their various combinations produces *harmony* in a picture—one of if not absolutely the most essential quality it can possess.

The mixing in certain proportions of any two of the *primary colours* will produce what we term a *secondary colour*. This secondary colour will be found to be *complementary* to the remaining colour. For example, the mixture of blue and yellow will produce green, which colour is complementary to red. The mixture of yellow and red produces orange, which is complementary to blue; and the mixture of red and blue produces purple, which is complementary to yellow.

In order to fix this on the mind, I would suggest making a circle, and then dividing it into six equal parts, and place a number in each up to six. Now pass a wash of red over 1, 2, 3; 3, 4, 5, blue; and 5, 6, 1, yellow. By this you will see that space 1 is coloured orange by the combination of red and yellow, and that opposite to it is the primary blue to which it is complementary. No. 3 is coloured purple by the combination of red and blue, and is opposite the remaining primary yellow, and to which it is complementary. Space 5 is coloured green by the mixture of blue and yellow, and is opposite and complementary to the primary red.

Modifications of these tints may be carried on to almost an unlimited extent with similar results, and doing so even to a moderate extent will be wonderfully effective in instructing the eye in the harmonious placing of the various colours. The combination or blending together of two secondary colours will produce what is termed a *tertiary*, and which in turn is complementary to the remaining secondary. Take, for example, the mixture of purple and green—olive is the result, and it is complementary to orange; purple and orange produce russet, which is complementary to green; orange and green produce citrine, which is complementary to the remaining secondary purple; and so on, and so on.

These relations of the various colours and their blendings one with another are not by any means the result of taste or fancy, but are based on sound art principles. They seem to exist as a physical necessity for the organs of vision, as may be seen by a very easy and simple experiment. Suppose, for instance, that we place a red wafer on a sheet of white paper; then steadily fix the eye upon it for a few moments, then remove your gaze to another plain sheet of paper, and in a couple of seconds a similar spot to the wafer will become visible, but of the complementary colour to red—green. This simple fact was, some few years ago, utilised by that enterprising firm, "Pears's Soap," for advertising purposes on all our leading hoardings. This spot, which is called an *ocular spectrum*, will remain visible for some few minutes, until gradually the white light reflected from the paper will completely displace it. The same principle holds good all round. If the experiment be tried with a blue wafer, the colour of the spectrum thus produced will be orange; if a yellow wafer, a purple spectrum will result, and so on.

In all the endless varieties of the various combinations of colours this principle will be found to hold good. If a tint of red incline to a yellowish hue, as in scarlet, the complementary green must have a slight preponderance of blue, and so be a somewhat bluish green. Then, again, if the red partake somewhat of the blue, as is the case with a crimson, the complementary must incline a little to yellow, in other words, be a yellowish green. So numerous are the combinations, and so delicate the gradations that may be produced in this way, that it would be nothing short of folly to attempt to enumerate them.

Every primary and its complementary secondary will, on examination, be found to possess special contrasts and effects quite peculiar to themselves. Now blue is the coldest colour, and is also the most retiring, while orange, its complementary, is the warmest and most advancing. Every combination of tints as they approximate to orange or blue will be warm or cold in its effect as the case may be. It also carries the effect of approaching the eye or receding from it in a picture.

Yellow is the brightest colour, and the most allied to light. Its complementary, purple, on the contrary, is the darkest. White and black, it may be well to mention, although they most completely represent the contrast of light and darkness, are not regarded as colours. White, which naturally most assimilates with light, is supposed to represent a combination of all the colours, while black, like profound darkness, is a complete absence of both colour and light.

The most positive, assertive, and exciting of all the colours is red, while its complementary green is the most soothing and grateful to the eye.

In mixing tints it will be found that although the combinations of two primary colours produce a new and perfect hue, every subsequent combination will tend to produce neutrality. It is thus that neutral tints are formed, and they will be found invariably to more or less possess the special characteristics of the primaries to which they are most allied.

The effect of contrast is produced by the skilful placing of the complementary colours in juxtaposition. They mutually enrich each other, thus producing what is termed the harmony of contrast. Purple and yellow, for example, of equal purity and intensity, will each become brighter by contact one with the other. The yellow, gaining intensity by the extra yellow rays reflected by the purple, and the purple gaining additional richness from the purple rays emitted by the yellow. Similarly, all neutral tints placed near full hues will seem to be tinged with the complementary colour of such hues. Thus a grey placed in close proximity with red, it will seem to become a kind of greenish grey, green being the complementary of red. This will show how important is the judicious arrangement of the various colours, as on it depends the brilliancy and harmony of the entire picture.

(To be continued.) REDMOND BARRETT.

PHOTOGRAPHY IN JAPAN.

A FEW words as to the condition of photography in Japan may be of interest to some, and particularly to any who may think of visiting the country.

I arrived here only a fortnight ago, but was not allowed to remain long in ignorance of the fact that in matters photographic, as in others, the Japanese are coming well to the front.

Before entering on this question, however, a few words on another. There are often discussions as to packing of plates and of apparatus for long voyages. As I have come about 12,000 miles without suffering any loss beyond the breakage of the ground-glass of one of my cameras, and this in spite of the fact that my boxes received the very roughest usage, it may be interesting to know how the things were packed.

Two cameras, one 12×10, the other 6½×4½, and seven lenses—the largest a 3¼-inch portrait combination, the smallest a portable symmetrical of 10-inch focus—were placed between two layers of clothes in a large Saratoga trunk. I took only a few dozen plates with me, some of 12×10 inches, the others of 6½×4½. These were packed in the boxes with paper-lined metal grooves made by Arundel & Marshall, of London. I think these boxes decidedly deserve a good word to be said for them. Their convenience is great; the grooves being metal, the boxes may be often refilled; and they seem to allow of very rough usage without being themselves damaged or allowing the plates to be broken. The boxes were placed like the cameras, between layers of clothes in the Saratoga trunk, and the way in which this trunk was treated was such that I scarcely expected to find a whole plate when I opened it. An American porter's idea of how to move about a box when it is too heavy to lift it appears to be to roll it over on its ends, top, and bottom. It is not a cheering sight to see a box which contains cameras, plates, and lenses going bump, bump in this fashion along a stone floor; but there is no help for it. Remonstrance has no effect whatever. This sort of treatment was repeated at each of some six or seven "depôts" on the way across America. It was bad enough, but worse was to come. All luggage had to be transferred in Yokohama Bay from the steamer to a small tender, the water of the Bay being too shallow to allow large vessels to come close to shore. My unfortunate box, being very heavy—about 300 pounds in weight—was being lowered in rope slings over the side of the ship; it had only got well over the edge when it slipped from these, and fell a height of about eight feet on to the deck of the tender. Of course I expected that the 12×10 plates, at any rate—they being supported only at their ends in the grooves of the box—would be smashed to bits. I was, therefore, agreeably surprised to find that not a single plate, either large or small, had suffered. It is on this account that I think the boxes I have mentioned really deserve to have attention called to them.

A few exposures were made on board the steamship "City of Sydney," whilst crossing the Pacific. The Pacific, by the way, scarcely kept up its reputation for peacefulness, and it was only as we neared Japan that there was a day calm enough to make the manipulation of a camera on the deck at all a promising performance. It was at this stage, when I was about to expose on board the ship, having unpacked my box for the purpose, that I discovered the breakage of the ground-glass of one of the cameras. No ground-glass was to be had on board, nor was any flour emery, with which a piece of plain glass might readily have been ground; so I had to make shift by taking a gelatino-bromide plate, soaking the film till it swelled, melting it by placing the plate on the corner of the high-pressed cylinder of the main engine, and allowing the greater part of the emulsion to run off, thus leaving a thin film.

I should not have mentioned the exposures on board ship but that I learned a lesson from them—namely, that on account, probably, of the great amount of reflected light from all directions, and the consequent absence of any deep shadows, a very short exposure only is needed for groups, &c., on board ship. This might have struck me before, rather than after, I had made some half-dozen exposures, but it unfortunately did not; and I found that plates exposed on groups in diffused light were almost hopelessly over-dense with times of half to quarter second, and stop No. 16 U.S. (⅛), the plates being rapid, but not extraordinarily so. One-half or one-third of the exposure would have been sufficient.

I had not been five minutes in the Grand Hotel, Yokohama, when a *Guide to Yokohama and Tokio* was presented to me. On looking at it, I found that the guide was got up by an enterprising photographer in Yokohama. I soon had an opportunity of judging of the quality of work turned out by him and by two or three other professionals, most of them Japanese, and came to the conclusion that it was at least up to the average of English landscape work. Nor is this to be wondered at, for there is a vast choice of subjects here of a most photographable nature, and the light is exquisite. It is an almost universal practice to colour landscape photographs in Japan. In so great disfavour is the colouring of prints on albumenised paper generally held at home, that it is very difficult to overcome the strong prejudice that one feels against the practice; but it must, on consideration, be admitted that, in Japan, it is at least a much more excusable practice than in England. Landscape photographs are generally purchased here, by visitors, to take home to give some idea

of the country to their friends, and, as a matter of fact, no idea—or, rather, only half an idea—can be given if the element of colour be left out of the pictures. Colour is of importance enough at home; but it is of very much greater importance here, where its vividness is something it is impossible to describe. Especially is this true of the greens. The most gaudy colouring cannot show them as more brilliant than they are.

Then, again, the colouring of photographs has probably fallen into disrepute rather because it has been badly done than because there is anything essentially vicious in a painted photograph, and the Japanese are well known to be most skilful in the use of colours.

In the Gallery of A. Farsari & Co. I had the pleasure of seeing the native artists at work. They were to be seen busily engaged in a large room, each artist in the position almost universally adopted by a Japanese for his work, namely, squatting on a straw mat.

Straw mats form almost the sole furniture of Japanese rooms, either for dwelling or for working. The men, women, and children squat on them during the daytime, and sleep on them at night, and very comfortable they are to sleep on; but the squatting is a thing not possible to the average European. A Japanese kneels down, then quietly bending his knees sits on his feet, the toes being extended straight backwards. Let any of your readers try the attitude, and report the result. The writer's attempts resulted in the most lamentable failure. Of course a worker sitting as described requires a very low table only; indeed, his work-bench is more like a very low stool than any other European article of furniture that I know of.

Farsari's artists were very slow and careful in their work. He informed me that he was satisfied if each coloured two or three prints in a day. This allows time enough for each print to be really well coloured, and, indeed, I have seen no better work in the way of coloured photographs anywhere than some of Farsari's productions. There is, at least, one dealer in photographic requisites in Yokohama. There is also, at least, one Japanese plate maker. I have not yet been able to judge of the quality of the plates he turns out, but hope soon to do so.

Chemicals are to be had at very moderate rates, and of guaranteed purity. I mean actually guaranteed by the Government, which allows no chemicals to be sold till they have been examined at the Government laboratory, have proved to be of a high standard of purity, and have been stamped with a Government stamp, indicating that the examination has been made. This applies, at any rate, to all chemicals that may be used as drugs, and, therefore, applies to most of those used in photography, and others also, I believe; but of this latter I am not certain. The examination, I understand, is no perfunctory affair, but is a very genuine one. Might not some countries, whose people imagine that they are far more civilised than the Japanese, take a hint in this matter?

Of the amateur element there seems to be scarcely anything in Japan at present. Many amateurs have visited the country, and have exposed plates in it; but of residents there are, at present, so far as I know, only some three or four, including myself, who practice photography as an amusement.

At the College of Engineering, photography is more or less used for scientific purposes, apparently the wet process only being worked. The "blue process" is used for copying tracings.

It will soon be holiday time with me, and I intend, when it is, to take a small camera with me right into the interior. I shall endeavour to get to places where no "white man" has yet been; although I am by no means confident of being able so to do, as there are now but few such places left. At any rate, I am pretty sure to meet with some things of interest enough to be worth communicating to British readers, and I may possibly be fortunate enough to get some pictures which may be different enough from anything we have at home to be worthy of reproduction. This, however, remains to be seen. I intend to take with me only a camera, two lenses, and about half a gross of plates. The mode of travelling is by "jinrikisha," a jinrikisha being a small two-wheeled carriage drawn by a man. The hire for carriage and man is only some 2s. 6d. a-day in the country; of course the weight that can be carried is limited, although it is extraordinary what burdens a good jinrikisha man can carry, at what rates, and for how great a distance. On flat ground a good runner will keep up a rate of eight to nine miles an hour for several hours, and show scarcely any signs of distress at the end of that time.

W. K. BURTON.

ON EXPOSURE.

EXPOSURE, it need scarcely be said, means the act of submitting a sensitive surface to the action of the light sufficiently long to obtain a developable image by accepted and ordinary methods. This is the broad

way of looking at it, for, at present, it is an undecided point how long it is necessary for light to act before this developable image is produced. More than one eminent scientist believes that the *most* instantaneous impact of light under any circumstances (that is, strong or weak light) is sufficient to produce that molecular condition that we discover to have taken place on development. In a communication I received from Professor Hunt, he said his opinion was that the mere momentary impact of light was sufficient to produce the requisite molecular alteration. It would therefore depend on the means used to develop this latent image that would determine the quality of the negative, under exposure being an obsolete term.

At the present time we unfortunately have to deal with many under exposed films, according to our knowledge of development, and although the image may probably be there, we have no means of making it available. A developer sufficiently potent has yet to be discovered, and till that time comes we can do little more than make the best use of those we have. Therefore, in talking of sufficient exposure, it must be understood to mean an exposure that can be developed into a good *printing* image, in contradistinction to an image that may look pretty as a negative and interesting as a chemical effect, and that by means of developers in ordinary use, such as alkaline pyro or ferrous oxalate. I believe most photographers look to ammonia as the most effective alkali for this purpose, although by some workers perfect results have been obtained with ferrous oxalate, and with the most brief exposures.

Hydrokinone, and other unusual developing agents, may for our purposes be disregarded for the simple reason ferrous oxalate and alkaline pyro are almost universally used. Much also depends on the emulsionised plates, and in the present state of affairs these are very variable, a somewhat loose style of estimating their rapidity being adopted, the assumed standard of so many times quicker than wet collodion being a popular style of description; a wet collodion film itself varies very much in rapidity, according to the manner of its preparation. Thirty, forty, fifty, or sixty times more rapid than wet collodion conveys but a very ambiguous idea of the rapidity of the plates so labelled. The Warnerke sensitometer is, perhaps, the best available guide, and is, under certain conditions, a very useful and reliable instrument. The plates in many instances do not carry out the legends of rapidity inscribed on their wrapper, whatever means may have been used to estimate them.

There are in existence many examples of what is termed instantaneous photography on wet collodion plates—street scenes with moving figures *sharply* depicted. It must be borne in mind street scenes, in large towns and cities, are much more weakly lighted than seaside views, and to render such sharply indicates a very sensitive film. To judge by the recent attempts of street work with presumably the quickest plates in the market, the assumed fifty or sixty times rapidity is very questionable indeed. With a wet collodion plate years ago, the exposure of a portrait in a good light at the seaside averaged about half a second, stops $\frac{1}{4}$ or $\frac{1}{6}$, everything being in good order and working at its best. With an acid bath and some samples of collodion, five to ten seconds, and even longer with a similar light and stop was not too much. So it will be seen that from any point of view wet collodion can scarcely be used as a standard, *unless the time required for the exposure of the collodion and the aperture of lens used is stated*. We will put it this way—an interior would be *properly* exposed in half an hour with wet collodion; now if there is the slightest reliance to be placed on the statement that the dry plate is sixty times faster, *half a minute* ought to be sufficient to produce a similar *well exposed negative*. For my own part I have never met with a plate that would produce as good a negative as that given by the wet collodion in half an hour in less than fifteen or twenty minutes. And I look on these statements of rapidity as most misleading, not to say ridiculous. Some effect would no doubt be produced by the short exposure, and the high lights might be indicated, but something more than this is required for a good photograph. It seems as if *only* in a brilliant light a gelatine plate works very much more rapidly than a collodion one, but where there are great contrasts, as in interiors, the difference is not nearly so great; in all probability an exposure that would have no effect on a wet collodion plate would show the windows of an interior distinctly, but the dark portions would not be rendered any better than on the wet plate, or, in other words, they would not be impressed at all.

There is yet much to be learnt as to the behaviour of gelatine plates, and the infinite variety of "makes" tends to complicate matters. The same emulsion formula will give vastly different results dependent on the manner of mixing, both in quality and rapidity, and the test standard for it varies greatly, as I have already pointed out. Under these conditions uniformity of result cannot be expected, nor can exposures be regulated with anything like certainty.

No means should be neglected to obtain uniformity, both in making the emulsion and developing. The first is, perhaps, out of the power of most photographers, who are dependent on commercial samples of dry plates; but the latter is more under their control, and a good style of development well stuck to will be much more likely to produce good results than the trial sometimes of one kind and sometimes of another. The characteristics of dry plates necessarily vary, and perhaps contrast with wet collodion and gelatine in the effects of prolonged exposure as much as anything.

The reversal of the image produced by excessive action of light is very curious. With wet plates it would simply produce dense fog, but with gelatine a point is reached where, instead of fog and density, the image gradually changes its character from a negative to a positive. Some plates are very much more prone to this than others, and where the balance is very delicate the plates are usually very difficult to manage, being apt to give an image deficient in pluck, or, in other words, work thin. Another peculiarity in some gelatine films is that—we will suppose a proper exposure effected, by continuing the exposure instead of the image reversing as in the previous case—it will continue to gain in intensity without getting any more detail, the shadows remaining as clear as if only the correct exposure had been given. Plates that give extra density in this manner are difficult to reduce by the ordinary means, hydrochloric acid and alum having very little effect. There also seems to be a tendency to want of gradation in all views that are very brightly lighted, say by full sunshine, whether interior or open landscape. This hardness is very much more pronounced in character than a similar effect produced on wet collodion, owing, I think, to the superior printing qualities of the shadows on wet collodion negatives to those of gelatine. Perhaps the difference in the physical qualities of the film may account for it, one being hard and thin and the other soft and thick. But whatever the cause, the effect is very decided, the advantage certainly lying with the wet plate, which will produce a softer and more delicate silver print.

It is a difficult matter to accurately gauge the printing qualities of a gelatine negative, but generally one that is *not quite clear* in the shadows gives the best results in most cases, although it looks worse as a negative than a clear, bright one. A wet collodion negative was usually condemned if there was *not* some little deposit or veiling over the whole subject. The veil in collodion was much more easily penetrated by the light than *apparently* the same amount of veil in a gelatine film, which in the case of gelatine will produce *flatness* in lieu of softness—a fault that has probably influenced photographers to so strongly advocate clear shadows in gelatine work, thus encouraging the fault of want of atmosphere that a slight trace of veil certainly gives, *providing it has the proper character*. It is necessary to make this reservation, as the veils differ as much in character as the plates and development; but given the right sort of veil there is no doubt of its usefulness. Very skilful photographers of artistic ability like plates that give a little green fog on account of this softening effect, but if the gelatine films were ideally perfect, the films themselves being absolutely clear except where acted upon by light and of the utmost sensitiveness, the image would be probably graduated, and the effect similar to a first-rate wet plate. This is the standard we must work up to in both emulsions and development. It is an accepted fact that an under exposed negative will not produce as good a print as a correctly exposed one. There is invariably a want of printing power in the detail of the shadows.

A fault very conspicuous in much dry plate work is that of want of atmosphere. Aerial perspective was easily obtained by wet collodion, and conferred upon negatives one of their greatest charms, for in a good wet collodion negative there was no part that ought to have it without *printable* detail; clear glass, or its equivalent, was only to be found in minute quantities in the very deepest shades. Light passing through such a negative met with a certain amount of resistance in all parts; and when we notice how much effect is produced on sensitised albumen paper by anything, even by clear glass interposing between the paper and the light, it can be easily conceived why the old wet plate gave such a soft, rich image, and that dry plates frequently fail to do so. The characteristic failing of dry plates is either to be flat in the shadows or clear and destitute of printing detail—merely another sort of flatness. Exaggerated density in the most brightly lighted portions of a picture of either interior or landscape is often experienced when the rest of the subject has had apparently the right exposure. This is a very annoying defect, and most difficult to deal with. It is to be hoped after a time the relation of exposure to development will be better understood, and we shall gradually eliminate the faults that crop up unexpectedly and give a vast amount of trouble.

These are but stray thoughts on the matter, as I feel myself far from thoroughly acquainted with the mysteries of dry plates, and a

proper exposure and development is with me, perhaps, as much a matter of guesswork as absolute and certain knowledge of cause and effect, and it seems probable that until experience sets matters right it will remain so. With regard to exposure tables—given an even, good light of the same intensity for all subjects, such tables would be exceedingly useful; but as we have to deal with light constantly varying, even when it appears uniform, their usefulness can be but limited, and the proper time of exposure, even without any other complication in the form of plates and developers, must ever be a matter of experience, until that happy time arrives when photography will equal arithmetic in results worked according to rule.

EDWARD DUNMORE.

THE NEW OPTICAL GLASS AND ITS IMPORTANCE IN PHOTOGRAPHY.

THE reader has undoubtedly heard or read a descriptive notice of the new German optical glass and its wonderful properties. More than enough has been published, in various periodicals, by more or less competent writers, of this certainly very important matter, without giving the public a true understanding of the characteristic features of this invention or discovery. It may, therefore, be welcome to all who take an interest in the matter to learn a little more about it from one who has been for half his lifetime engaged in the production of articles and instruments for which the so-called optical glass serves as a material.

Thanks to the progressive and industrious spirit of our age, there are at present in general use a large variety of optical instruments and lenses, serving the most varied scientific, business, and private purposes. Almost every one of them, from the large and costly astronomical telescope down to the modest pocket spy-glass, are, in these exacting times, required to be "achromatic"—which means "free from colour." An achromatic glass frees the object, or, rather, the image or picture of the same, from the disturbing prismatic or rainbow colours with which the edges are fringed when seen through a simple non-achromatic glass. Let us see how this is accomplished.

The magnifying, or reducing, or image or picture-producing lens owes its peculiar attribute to the property possessed by the glass of which it is constructed to change the direction of a ray of light, when it enters the lens, in an oblique direction to the surface at which it entered. This property is called "refractive power;" it varies not only for different kinds of glass—that is, one glass will, under equal conditions, refract the light to a greater angle than another—but it is also in one and the same glass different for the different components of the ordinary white light, and consequently a ray of white light, if refracted by passing a prismatic glass, will separate and disperse its components, which then present themselves to our eye by their own specific colour by which we recognise or distinguish each of them. These colours are the well-known prismatic or rainbow colours, and the power of the glass to separate these components or colours is called "dispersive power." Flint glass has a much greater dispersive power than crown glass. Its refractive power is also greater than that of the latter, but the relative difference of the dispersive powers of these two glasses is much greater than that of their refractive powers. Therefore, if an ordinary crown-glass lens be combined with a negative (reducing) flint-glass lens of just enough (negative) dispersive power to neutralise that of the crown-glass lens then its negative refractive power will not be great enough to completely neutralise that of the crown-glass lens, and consequently there will be a remainder of refractive power forming a focus of greater length than that of the crown glass alone without the flint glass. But, as the prismatic colours by this combination are completely neutralised, the remaining refraction is free from colour dispersion. This is an achromatic lens.

If a crown-glass prism, of such angular form as to have a great refractive power, be placed at some distance before a white screen, so that a beam of sunlight passing through the prism will be horizontally dispersed to a widespread colour spectrum upon the screen, and if right above or below this a flint-glass prism be placed which is of so much smaller angle (because of the greater dispersive power of the glass) that the spectrum produced by it appears to be just equal in length to that of the crown glass; if, then, by moving one or the other prism, the spectra are so adjusted that one appears exactly below the other, it will be presumed that all the corresponding colours of the spectra coincide so perfectly as to make the whole appear like a single spectrum of double width; and such coincidence is, indeed, highly desirable, because it is the condition of perfect achromatism. But, unfortunately, such is not the case, for, while the total or general length of the two spectra are so adjusted as to be equal, the corresponding colours of the same cannot be made to be all in line at the same time;

for instance, some of the colours of the upper spectrum will appear a little too far to the right, and others a little too far to the left. There is, indeed, a marked difference between the two spectra in the relative widths of their corresponding colours, and this difference is so great as to permit only two of the bands of colours to be in line at the same time, thus making the perfect coincidence of the spectra impossible. For this reason it is easy to understand that the achromatism of a lens, composed of such crown and flint glass, cannot be perfect, but a small remnant of all the colours but two will be visible, even with the most favourable proportions in the combination of glasses. This remnant of colour is called the "secondary spectrum."

As, therefore, owing to the described unfortunate fact, it is really impossible to get, by means of the combination of crown and flint glass, more than two of the spectral colours to coincide, or, in the case of a lens, to unite to a common focus, the question now arises, which two colours of the whole spectrum should be united to give the most favourable results? This question is answered, theoretically, by calculation, as well as by practical experience, thus: That the orange-red and bluish-green which enclose the brightest and strongest visual colour, the yellow, are the most favourable to be united to a common focus, and, indeed, a lens corrected in this way produces a very brilliant and colourless, or rather, colour-correct image of the object. This mode of correction is therefore most generally adopted by opticians and mathematicians in the calculations of their optical formulæ.

But for photographic purposes an objective of this correction has the fault that the strongest chemical or actinic colours, the indigo and the violet, have a longer focus than the brightest visual colour, the yellow, and, in consequence, if with such an objective the image of an object is sharply focussed by the eye, the photographic picture produced in the same plane will appear to be out of focus, and in order to obtain the desired sharpness of the latter the lens must, after focussing by the eye, be drawn out to a certain—or rather uncertain—point before making the exposure. To obviate this difficulty, caused by the difference of the visual and actinic foci, the mode of correction must be changed in such a manner that the brightest visual, the yellow, and the strongest "actinic" colour, the violet, are united to a common focus. By this mode of correction the photographic picture will come out sharp, when properly focussed by the eye, and the objective thus corrected can be said to be free from difference of the visual and actinic foci.

From these explanations* it appears that the secondary spectrum is the principal cause of a number of defects in the correction of our present achromatic lenses, and that this is especially so in reference to the photographic objective. If the spectra of the two glasses used in the construction of the objective were perfectly coincident then the latter, if properly corrected, would unite all the colours of the spectrum to a common focus, and the secondary spectrum would be an unknown phenomenon, and consequently not only the visual and actinic foci would be perfectly identical, but also the whole amount of light passing through the objective would form a common, sharp focus, and an increased rapidity, aside from perfect sharpness of the picture, would be the result. But, as has been stated before, the secondary spectrum permits only two colours to be united to a common focus, and although the two colours most favourable to photography are selected, the rest of the spectrum is not only lost for co-activity in the production of the picture, but, because of its being more or less out of focus, is even injurious to the same. Since the discovery of the secondary spectrum as the cause of the remnant of colour noticed even in the most carefully corrected objectives, various attempts have been made from time to time to produce two kinds of glass which would, besides the other requirements of an achromatic lens, produce coincident spectra, or nearly so—that is, nearer than the present crown and flint glasses do.

About twelve years ago the writer of this received intelligence that an English firm had succeeded in producing crown and flint glass, which, if used together for an achromatic lens, would leave no secondary spectrum. Samples of this new glass were ordered, but the order was never filled. Later on it was reported that one of the first opticians of England had done his utmost to construct from this glass a telescope objective of superior quality, but had failed in his endeavour. And, furthermore, that it was exceedingly difficult to obtain a perfect polish on the surfaces of lenses made of the new glass, which, therefore, had to be regarded as a failure.

Some time ago Dr. Abbé, Professor of Mathematics at the University of Jena, Germany (who made himself famous as the scientific assistant of Dr. Carl Zeiss, the optician of the same place, in the improvement of the microscope), began experimenting to find some chemical composition to be used in the construction of crown and flint glass of such superior quality as to suit the advanced requirements of the present achromatic objectives, and at the same time to have such proportions

of their prismatic spectra as to reduce, or, if possible, to eliminate the secondary spectrum. He was assisted in his experiments by eminent chemists, and thus, by the co-operation of the mathematician, the chemist, and the optician, a success was soon reached and announced to the world. It was, however, admitted, at the same time, that considerable work and experimenting on a more extensive scale would yet be required to carry the important problem to a final and complete success, and the German Government generously appropriated the sum of ten thousand dollars to secure the great work as a benefit to the world. Thus patronised, the new Jena works for the production of optical glass at last offered to all opticians their new productions, furnishing full descriptions and a scientifically valuable table of their various glasses, from which in exact figures all their special optical properties and relations to each other can be learned. Thus the optician was enabled to select from the list just what was needed or preferred for his special work. The writer has since that time had sufficient experience with the new glass to feel competent to give a correct and reliable report regarding the value of the product as a superior material for the construction of optical instruments in general, and for photographic objectives specially.

The new glass does not completely remove or neutralise the secondary spectrum, and, indeed, the makers themselves do not claim this for it; but it unites three colours of the spectrum exactly to a common focus and brings the rest so near to this focus that only with great difficulty the trained eye can detect a very faint "tertiary spectrum." To one who has for many years treated optical glass in earnest endeavour to get the best possible achromatic lenses out of it an objective made of the new glass and carefully corrected, appears as a great phenomenon—a missing of something to which he had been so long accustomed that its presence seemed a natural necessity—a condition of the achromatism of a lens.

The great value of the new glass to photography could hardly have been given a more severe test than was done recently by means of a compound objective of three-quarter-inch equivalent focus, which was constructed of the new glass by the writer for the microscope only, without special regard to photographic purposes. It was, however, afterward tested photographically by Mr. George W. Rafter, of Rochester, N.Y., an authority in photo-micrography. The negative was taken at a distance of seven and a half feet from the objective, thus giving a magnification of 110 diameters.

By a close comparison the image on the ground plate could not be detected to be different in the slightest degree from that reproduced in the negative, showing conclusively that there was not the slightest difference of visual and actinic foci. According to Mr. Rafter's own statement, the lens is in fact a remarkably fine photographic objective, although not expressly made for that purpose. The new glass has a very clear and brilliant appearance, the crown glass being entirely free from the slightest trace of colour, and the flint glass being but very slightly tinted, is at least equal to the best in that respect. The prices of the new glasses, both flint and crowns, are high, being nearly eight times that of ordinary optical glass. ERNST GUNDLACH.

—*Photographic Times.*

CONTROLLING THE TONES OF PHOTOGRAPHS BY DEVELOPERS.

THE following formulæ are for use with gelatino-chloride paper or plates. The quantities are in each case calculated for one ounce, three parts of each of the following solutions being employed and added to one part of solution of protosulphate of iron; strength, 140 grains to the ounce.

Staty Blue.

1.—One part of the above solution to three parts of a solution of citrate of ammonia.

Greenish Brown.

- | | |
|-----------------------------|-------------|
| 2.—Citric acid | 180 grains. |
| Carbonate of ammonia | 50 " |
| 3.—Citrate of ammonia | 250 grains. |
| Chloride of sodium | 2 " |
| 4.—Citrate of ammonia | 250 grains. |
| Chloride of sodium | 4 " |

Sepia-Brown.

- | | |
|-----------------------------|-------------|
| 5.—Citrate of ammonia | 250 grains. |
| Chloride of sodium | 8 " |

Clear Red-Brown.

- | | |
|-----------------------------|-------------|
| 6.—Citric acid | 120 grains. |
| Carbonate of magnesia | 76 " |

* See First Paper, published in the issue of June 22.—EDITOR, *Times*.

<i>Warm Grey-Brown.</i>		
7.—Citric acid	120 grains.	
Carbonate of soda	205	"
<i>Deep Red-Brown.</i>		
8.—Citric acid	120 grains.	
Carbonate of potash	117	"
<i>Green-Blue.</i>		
9.—Citric acid	90 grains.	
Carbonate of soda	154	"
Citrate of potash	24	"
Oxalate of potash	6	"
<i>Sepia-Red.</i>		
10.—Citric acid	80 grains.	
Carbonate of soda	135	"
Citrate of potash	12	"
Oxalate of potash	3	"
11.—Citric acid	108 grains.	
Carbonate of magnesia	68	"
Carbonate of potash	12	"
Oxalate of potash	3	"
<i>Sepia-Yellow.</i>		
12.—Citric acid	40 grains.	
Carbonate of magnesia	25	"
Citrate of ammonia	166	"
13.—Citric acid	120 grains.	
Carbonate of magnesia	72	"
Carbonate of ammonia	72	"
Chloride of sodium	8	"
<i>Blue-Black.</i>		
14.—Citric acid	120 grains.	
Carbonate of ammonia	70	"
Carbonate of magnesia	15	"
15.—Citric acid	120 grains.	
Carbonate of magnesia	38	"
Carbonate of ammonia	44	"
16.—Citric acid	90 grains.	
Carbonate of magnesia	57	"
Citrate of potash	54	"
Oxalate of potash	18	"
17.—Citric acid	72 grains.	
Carbonate of magnesia	45	"
Citrate of potash	54	"
Oxalate of potash	18	"
18.—Citric acid	60 grains.	
Carbonate of magnesia	38	"
Citrate of potash	68	"
Oxalate of potash	22	"
<i>A more Intense Blue-Black.</i>		
19.—Citric acid	30 grains.	
Carbonate of magnesia	18	"
Citrate of potash	100	"
Oxalate of potash	33	"
<i>A Clearer Blue.</i>		
20.—Citrate of potash	136 grains.	
Oxalate of potash	44	"

In the Photographic Exhibition at Florence, the firm of Corvan* places on view a frame containing twenty proofs produced by the foregoing twenty formulæ, in such a way that the observer can compare the value of each tone and select that which pleases him best.

—*Le Moniteur de la Photographie.*

IMAGE TRANSFERENCE.

By the term Image Transference, I propose to denote certain effects produced on sensitive films, effects curious in themselves, and of interest in connection with the subjects of papers which have appeared in the May and June numbers of this Journal.

In those investigations it was shown to be possible to take a film of a silver haloid—chloride, bromide, or iodide—and after making marks upon it with sodium hypophosphite to obtain a development of these marks, precisely as if they had been impressed by light, but quite in-

* Does this mean Mr. A. Cowan?—*Transtatior.*

dependently of any exposure to light. I now propose to show that it is possible to develop on a film of silver haloid a complete image—a print from a negative, for example, without either exposing the silver haloid to light, or to the action of hypophosphite, or subjecting it to any treatment whatever, between the moment of its formation and that of its development. The film of silver haloid comes into existence with the image already impressed upon it. For this purpose almost any silver salt is selected; citrate, benzoate, tartrate, pyrophosphate, &c., answer perfectly. (Some silver salts, the phosphate especially, undergo a slight reduction spontaneously in the dark; these are less suitable.) A film of the silver salt selected is formed on paper by the ordinary methods, and this is exposed under the negative to a few seconds of sunshine.

The next step is to convert this film into one of silver chloride or bromide by plunging it for a few minutes into dilute acid. Ordinary hydrochloric acid may be diluted with six times, commercial hydrobromic with two or three times, its bulk of water; the exact strength is unimportant. After a short immersion, the acid is to be washed out, and it only remains to put the film, now consisting of silver haloid, into a ferro-oxalate developer, when the image appears at once. The chloride or bromide of silver, into which the salts above mentioned are rapidly converted by the halogen acid, comes into existence with the image already impressed on it at the instant of its formation. So that although the substance which received the image is completely broken up and destroyed, the image is not, but is transferred in all its details to the new film of silver haloid.

It is therefore evident that the action of light on all silver salts that can thus transfer an image must be similar in all its essentials to the action of light on the silver haloids. An important conclusion follows, that all such silver salts must be capable of forming subsalts, else the image could not be transferred. In the case of most silver salts the existence of such subsalts has not before been recognised or even suspected; indeed, if I am not mistaken, the existence of such a subsalt of silver phosphate has been expressly denied. But the image formed by light on silver phosphate can be transferred, therefore subphosphate must exist.

These results have also a very direct bearing on the subject of one of my papers in the last number of this Journal. I there endeavoured to show that the photosalts of silver as obtained by purely chemical means are identical with the products of the action of light on the silver haloids, both with the material of the latent image and with the visible product of the continued action of light, or rather with the most characteristic constituent of that product. As respects this latter identity, I showed that although the brightly-coloured photochloride could not be obtained by the direct action of light on silver chloride, it could readily be formed indirectly by acting with light on other salts of silver, and treating the product with HCl. It might be argued that in this proof one link was wanting, namely, proof that the photochloride obtained by the action of HCl on silver salts other than chloride exposed to light was of the same nature as that obtained by the action of light directly on silver chloride. The results above described supply that link, if it was needed, and show that the photochloride obtained by the action of HCl on silver salts, other than the chloride exposed to light, has the same capacity for development as has the material of the latent image obtained on ordinary silver chloride.

But this proof itself may be thought liable to an objection. It may be said that as an image was certainly impressed upon the original film, it is not completely proved that the halogen acid had anything to do with the ultimate production of a developed image. The objection would not be well taken, and the experiment may be varied to two ways, either of which eliminates it.

Most silver salts are soluble in nitric acid. After applying the halogen acid, it may be washed off, and the paper may be placed in nitric acid until every trace of the original salt (supposing that any escaped the action of the HCl or HBr) is removed, and until it is absolutely certain that nothing is left in the film but the silver haloid. When this is done, the development, so far from being impeded, is rendered only the stronger and brighter. Certainly, therefore, the silver haloid is the essential base of the development.

Another very decisive experiment may be made in this way. Paper prepared with tartrate, oxalate, or almost any other salt of silver, is to be exposed for a minute or thereabouts to a strong light (not under a negative). It is then taken into a dark room, and marks are made upon it either with a glass rod or a camel-hair pencil dipped in dilute hydrochloric or hydrobromic acid. After letting the acid act for five or ten minutes, it is to be washed off, the paper plunged into nitric acid, and after again washing it can be placed in a developing solution, when the marks made will appear black on a white ground. This mode of operating gives a very convincing result. The nitric acid treatment may be omitted, but when this is done the number of salts that can be used is more limited. The four salts first above mentioned give good results, even without the nitric treatment, but some silver salts undergo a spontaneous change in the dark by keeping a short time, such that when they are placed in a developing solution (without exposure to light) they may blacken instantly all over. Silver tartrate is one of the best salts to operate with, though pyrophosphate, citrate, oxalate, and some others do almost equally well. Sulphate, antimonio-tartrate, phosphate, nitrite, and arsenite, do not give good results, except with the nitric acid treatment.

With a salt like tartrate or oxalate the experiment is very striking. The paper imbued with it is exposed to light over its whole surface, it is then taken to the dark room, and simply marked with dilute H Cl or H Br and washed. Thrown into a developer, all the marks of the halogen acid quickly blacken, proving, first, that the effect of light is transferred from the one salt to the other; second, that the effect as transferred to the chloride or bromide is far more susceptible of development than it was in the original salt. It seems a not unreasonable explanation of this last mentioned fact that the greater sensitiveness of the haloid compounds may depend on their power to combine with their own subsalts, so that the reduction may commence with the subsalt, and quickly extend from it to the portion of normal salt with which it is combined; that, on the other hand, other silver salts may not share this power of uniting with their subsalts, and are consequently more slowly and imperfectly attacked by the developing solution. This explanation may or may not be correct, but seems not improbable.

A curious fact incidentally presented itself in the course of this investigation: that when paper prepared with silver salts, other than the haloids, was exposed to light, and then marked with H Cl, the effect of a short exposure, so far as development was concerned, was as great as that of a long one. A piece of paper was prepared with a given salt by non-actinic light. It was then placed between the leaves of a closed book with one end projecting. The book was then placed in the light (very faint sunshine), and the prepared paper was gradually drawn out so that different portions received progressive exposures from four hundred seconds down to three seconds. A number of marks were made with H Cl diluted, parallel to the end of the paper, so that to each mark corresponded a different exposure from three seconds to four hundred seconds. The papers were then placed in nitric acid, washed and developed. These pieces are before me as I write, and it is impossible to say by the appearances which portion received the three seconds, which the four hundred. The marks are equal in strength on each paper from one end to the other. The salts used were: Silver benzoate, tungstate, phosphate, pyrophosphate, and tartrate. The short exposure gave a sufficient basis for development, the longer effected nothing more.

The object of this series of papers has been to offer a new explanation of the nature of the latent photographic image, and to show that it consists neither of the normal silver haloid physically modified nor of a subsalt, but of a combination of normal salt and subsalt. That the subsalt loses in this way its weak resistance to reagents, and acquires stability, thus corresponding to the great stability of the latent image, which, though a reduction product, shows considerable resistance to even so powerful an oxidiser as nitric acid.

Further, that this combination of normal salt and subsalt, which constitutes the material of the latent image, can be obtained by chemical means, and wholly without the aid of light. That the forms of these photosalts, as I have ventured to name them, which correspond to the material of the latent image, are either colourless or nearly so, but that other forms, possessing beautiful and often intense colouration, also exist. With the chloride some of these brightly coloured forms show a ready tendency to reproduce colour, in some cases with well marked and beautiful tints. So that we have here an approach to the solution of the problem of obtaining images of objects in their natural colours from a quite new direction, and probably with better hopes of an eventual complete success than by any of the older methods.

—The American Journal of Science.

M. CAREY LEA.

BLEACHING BROMIDE PRINTS.

[American Convention.]

PREPARING sketches in lines with black ink for photo-engraving purposes is now so general that it has seemed to me there is a need, if possible, of using bromide paper as an aid to the artist for this purpose, since it would save time and be more convenient. It is well known that if an untuned silver print be inked over in lines, the photographic image may readily be bleached out by pouring on the surface a solution of bichloride of mercury and alcohol, or the print may be floated thereon.

To obtain the best effects by the photo-engraving process it is required that the original sketches be of large size; hence, when a picture is to be reproduced, it is necessary first to make a small negative, then a positive by contact, and thirdly, from that, to produce an enlarged negative, from which the silver print is made, over which the artist sketches. It occurred to me here was an unnecessary amount of time lost, provided we could utilise the bromide paper, for upon that we might enlarge directly from the original negative to any desired size; then, by sketching over with ink, our object would be attained. But the difficulty that presented itself was the simplest and best way to bleach out the photographic image on the bromide paper, so as to leave a white background between the ink lines.

In looking over several books on photography, I was unable to find a definite formula for this purpose, but recently I read that a picture on bromide paper was made to entirely disappear by the use of ferric chloride. Acting on this suggestion, I submitted a bromide print, after fixing and washing, to the action of a very strong solution of ferric chloride for many hours, with the result of bleaching it out until it attained

a sandy brown colour. Beyond this the solution had no further bleaching power. Using a solution of bichloride of mercury on another print I was able to whiten it, but the shadows were of too pronounced a brownish yellow colour to render it of any use.

Recently I have tried a series of experiments which may be of some interest, as showing by what simple means successful results may sometimes be obtained. I first made an 8 x 10 under-timed bromide print, and before fixing it in hypo cut it into four parts. Two of the parts I fixed in a mixed hypo and alum bath. The other parts I left unfixed. Knowing that a weak solution of ferrid-cyanide of potassium (commonly termed red prussiate of potash) in hyposulphite of soda was the standard solution advised for reducing negatives, I inferred that if it was made strong enough it might act as a good bleaching agent by reducing away the picture. Accordingly, I prepared the following solution:—

Water	6 ounces.
Hypsulphite of soda	480 grains.
Ferrid-cyanide of potassium	240 "

Dissolving each in the order named. The solution presented a dark green colour and kept clear for about an hour, after which it became muddy.

Laying one of the unfixed portions of the bromide print upon a plate of glass I poured over it the above solution; rapidly and in about a minute all traces of the picture at once disappeared. After washing, looking at it by white light, it was, as I surmised it might be, quite yellow. The next question was to dissolve out the extra silver unacted on by light and whiten it. So I immersed it in the hypo and alum bath; but this had the reverse effect, for by decomposing the ferrid-cyanide the paper rapidly changed to a beautiful Prussian blue colour. When the print was dried I afterwards endeavoured to eliminate the blue by immersing in a weak solution of carbonate of soda, but without success. I then subjected the fixed portion of the print to the same solution for three-quarters of an hour, but was unable to reduce away the picture sufficiently. The result of this experiment shows that an unfixed bromide image may be immediately bleached out with the same solution, leaving a yellow colour on the surface of the paper.

I next made a solution of bromide of copper as follows:—

Bromide of copper solution	½ ounce.
Water	3 ounces.

I then submitted an unfixed portion of the bromide print to its action. In the course of three or four minutes the image was transformed to a very light yellow sandy colour. At this stage I dipped my finger in the hypo solution, then touched one corner of the print, and noticed all trace of the picture to disappear at that point very quickly. I then inferred a mixture of hypo with the bromide of copper would effect the same result. In this I was not disappointed, and found the following solution would effectually and easily bleach out either an unfixed or fixed bromide print in about five minutes' time. Continual movement of the solution over the surface materially helped the bleaching action:—

Bromide of copper solution	½ ounce.
Hypsulphite of soda	100 grains.
Alcohol	1 ounce.
Water	2 ounces.

The alcohol is added to prevent the ink from spreading.

I purchased the bromide of copper solution already prepared, but it is very easily made. The following is the usual formula. Make two solutions as follows:—

Bromide of potassium	120 grains.
Water	4 ounces.
Sulphate of copper	120 grains.
Water	4 ounces.

Mix the two and we have a bluish bromide of copper solution.

A final experiment was the immersion of a bromide print for long intervals in two successive baths of boiling water.

To my surprise, though the test was severe, no dissolving action took place. By running the finger over the surface of the print, the soft gelatine could be felt, but the picture appeared to be imbedded in the texture of the paper and did not disappear.

With this paper I submit the specimen sheets or pieces of paper treated in the different ways described for examination. The experiments were made upon Eastman's A paper, developed with ferrous oxalate.

In respect to the finished polished print here submitted, my experience is that one of the best and easiest ways to secure a high polish is to employ what is known as hand-polished vulcanised rubber sheets, or specially prepared ferrotype plates, and also a paper coated with rather more than the usual amount of gelatine. Too little gelatine will give the surface of the print a mottled, half-finished appearance, particularly when observed by reflected light. In warm weather the prints will not readily strip from the rubber sheets, unless they are fixed in a combined hypo and alum bath. Before squeegeeing on to the rubber, the surface of the print should be rubbed over with the fingers under water in the tray, to take off any of the milky sediment settling upon it while fixing. If this precaution is not observed, the print, when stripped, will present a mottled, mealy appearance.

A very simple squeegee is a thick rubber tube about one inch in internal diameter, drawn over a round stick, made somewhat longer than the tube.

The print is laid face downwards on the rubber, the surplus water on the back being taken off with blotting paper, the roller squeegee is then rolled over the print, pressing out all air-bells, besides bringing the print in uniform contact with the rubber. When dry, it is readily pulled off from the rubber, having a fine polish. No talc or oil is necessary. I have used these rubber sheets for nearly two years with perfect success, and do not notice that the surface becomes dimmed. For giving a high polish to unmounted silver prints the polished rubber is unequalled. Simply squeegee the albumen prints while wet on to the rubber the same as the bromides.

In conclusion, I may add that many of our valuable processes are founded on simple experiments carefully carried out; if, then, all those photographers who have the time and inclination would study and experiment, note the results, and freely impart the same to others, how much richer in useful and practical information the entire fraternity would become. I trust scientific experimentalists in photography will become more numerous in future years, especially in this country, and that a spirit of intercommunication of ideas and the exchange of the results of practical manipulation, will override all feelings of hesitation, competition, and jealousy.

F. C. BEACH.

RAPID PHOTOGRAPHY.

A GERMAN photographer, Herr Ottomar Anschütz, of Lissa, is at present exhibiting in Berlin a new apparatus, constructed to the order of the Prussian War Minister, by means of which he is able to reproduce on a screen pictures of moving objects. The art of photographing moving objects in successive positions is not new, but Herr Anschütz has brought it to a state of perfection not hitherto attained. One of the earliest workers in this direction was the painter Lugardon, of Geneva, who succeeded in photographing sea-gulls; and later, the French *savant*, M. Marey, constructed his photographic rifle, by which it was possible to take in rapid succession twelve impressions of a bird at which the rifle was aimed while on the wing. By releasing the trigger twelve plates were in succession exposed for a fraction of a second, and thus photographs of twelve successive positions of the bird were obtained. But in all these attempts the time required to obtain an impression on the sensitised plates was comparatively long, the average being about one-hundredth part of a second, whereas Herr Anschütz has succeeded in preparing plates so sensitive that an exposure of one-five-thousandth of a second is sufficient. The experiments connected with these improvements were begun in 1882, and were carried out by Herr Anschütz with a large number of animals kept in a small zoological garden attached to his photographic establishment. He began by photographing troops whilst performing evolutions, and large masses of people assembled on occasions of historic importance; progressing then to the photography of animals, such as pigeons, storks, horses, wolves, and stags. In all, 1300 of these photographs have been taken by him up to the present.

By order of the Prussian War Minister, photographs were also taken at the military riding school in Hanover, the pictures produced being found of great value in equestrian instruction. The apparatus used contained twenty-four lenses, with exceedingly rapid exposure, so that the leap of a horse could be subdivided into twenty-four positions, the apparatus being perfectly automatic, and so rapid in action that all the twenty-four impressions were, in certain cases, received in $\frac{1}{72}$ of a second.

So far, the work above described has only reference to the subdivision of motion into component positions; but Herr Anschütz has also succeeded in constructing an apparatus by means of which he is able to again combine the pictures obtained in rapid photography and reproduce them on a screen, so as to show a large audience the actual motion of the object which was photographed. In principle, the apparatus is similar to the well-known optical toy, where a series of pictures rapidly revolving produces the illusion of actual movement, but the details of the appliance have been greatly improved.

The rapidity with which the pictures must be taken necessitates the employment of a small lens, and hence the photographs are very small, generally only seven-sixteenths of an inch in length and breadth. These are enlarged to one and three-quarter inch, and transferred to thin glass plates. The twenty-four transparent pictures thus obtained are mounted upon an iron disc containing twenty-four windows near its circumference for their reception, and this disc is rapidly revolved before a Geissler tube bent into a spiral. Four Bunsen elements and a large induction coil supply the necessary high-tension current to render the tube luminous. Between the disc and the Geissler tube is placed a ground-glass shade, in order to tone down the light, and the beam is thrown through an aperture upon a large screen, so as to render the picture of the object photographed on the glass plates visible to a large audience. The disc is revolved at a speed corresponding to that during which the twenty-four photographs were taken. In the case of the horse above referred to, this speed would be about eighty-five revolutions per minute. The usual make and break of the induction coil is replaced by a make and break arrangement worked from the spindle on which the disc is mounted, and the contacts are so arranged that the primary circuit is broken at the moment when a picture comes opposite the Geissler tube, and again established during the intervening time. In this way only one very brilliant induction spark passes through the Geissler tube at the moment the primary circuit is broken, and as the reproduction of the picture on the screen lasts only an

infinitesimal fraction of a second, it is exceedingly sharp. Since the successive pictures pass at the rate of thirty-three per second, the impression upon the observer is, however, practically continuous, and forms a faithful reproduction of the actual object as seen in motion.

—Industries.

ENAMELLING PHOTOGRAPHS AND OTHER PRINTS.

"My invention," says Joseph P. Phelps, of Muscatine, Iowa, in his specification, "relates to the transparent covering of photographs or other prints so as to secure a permanent glossy appearance, and also to securing required colour or tone of the picture after it is made, and it consists in the preparation, combination, and application of the ingredients hereinafter named and described, so as to produce the desired results with certainty and expedition.

"To enable others skilled in the art to make and use my invention, I proceed to explain the method of preparing and applying the different elements.

"I will mount the prints to be enamelled on wet cardboard with common paste. I then prepare my emulsion in the following manner:—Glutina alba (or white glue), three ounces; soft water, eight ounces; half the white of one egg; glycerine, ten drops; French chalk, three grains. Put this mixture over a fire until thoroughly dissolved. Then take a French plate glass, or any finely polished glass, about two inches smaller than the cardboard the prints are mounted on (but large enough to cover the prints), which has been previously coated with the following solution:—Ether, one ounce; alcohol, one ounce; gun cotton, six grains; French chalk, one grain. I use to tint this last above solution any colour, so as to produce any desired tone on enamelled pictures, a drop at a time of the following preparation of 'fuchsine,' of any colour desired, mixed:—Fuchsine, one quarter ounce; alcohol, four ounces. Now lay this glass, coated side up, upon a block or raised surface inside of a tray made to catch the emulsion which runs off of the plate. After filtering the emulsion through a porous cloth into a pouring vessel of some kind, I pour a sufficient quantity across one end of the glass to cover the picture when squeezed over it. I then take the mounted print, clamp one end by a spring attached to the same block or platform that holds the glass, arranged so that the picture to be enamelled and glass with the coating of (No. 2) solution are exactly on a level. I now take a roller covered with thin rubber, or any material that will give slightly, and with one sweep roll the picture down on to the glass. I then lay the glass with picture on face down to dry. When thoroughly dry, run the edge of a knife between the edge of the glass and the picture, and the print will snap from the glass elegantly enamelled.

"What I claim, and desire to secure by Letters Patent, is:—1. An emulsion for photographs and other prints, consisting of glutina alba, soft water, albumen, glycerine, and French chalk, in about to proportions set forth. 2. An enamelling and tinting or toning composition, consisting of ether, alcohol, gun cotton, French chalk, and fuchsine, in about the proportions set forth. 3. The herein-described method of enamelling photographs of other prints, consisting in placing the enamelling emulsion in a line across a smooth surface, then clamping one end of the photograph or print, face down, to the surface over or back of the body of emulsion, and rolling the print upon the surface by means of a roller, substantially as set forth. In testimony whereof I affix my signature in presence of two witnesses."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
August 23.....	Great Britain (Technical).....	5A, Pall Mall East.
" 23.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 24.....	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 25.....	Liverpool Amateur	Royal Institution, Colquhoun-street.
" 25.....	Oldham	The Lyceum, Oldham.
" 25.....	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION. LAST Thursday night, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. A. Haddon presided.

Mr. BUCHANAN WOLLASTON exhibited prints of negatives taken during the excursions of the Convention in Scotland. He also exhibited excellent instantaneous views of Dover Harbour, including some photographs of the "Calais-Douvres" and of other Channel-passage boats under steam. One of the Scotch views taken on board a steamboat contained a good likeness of Mr. Smith, the Hon. Secretary to the North London Photographic Society, while Mr. Smith was in mid air, taking a leapfrog jump over somebody else on deck. The exhibitor said that the diaphragmatic shutter was used. He should be happy to take platinum prints from some of the negatives and to present the prints to the Association. Could anyone recommend a good finder? He had tried several but was not altogether satisfied with the action of any of them.

The HON. SECRETARY said that McKellen's was useful.

Mr. J. B. SPURGE recommended a biconcave lens.

Mr. A. COWAN added that a biconcave lens fitted on the middle of the top of

the front of the camera was good; a piece of brass with eyehole should be on the back of the camera, and the lens should have cross lines ruled on it. Everything necessary could be seen in the lens, even in sunshine, without any focusing cloth or screen over the arrangement.

Mr. A. L. HENDERSON said that a sixpenny Galilean telescope could be brought and the lens taken out for the purpose.

Mr. W. H. HARRISON called attention to a fine print in the *Bulletin Belge* from one of the Brussels prize negatives of M. Georges Wilmette, a Liège amateur; it had been printed phototype fashion by Herr. F. Bruckmann, of Munich, who was said by Mr. Léon Vidal to be one of the most expert men in Europe at that class of work.

Several members remarked that the women in the picture were represented at work left-handed; the sides of the photograph had apparently been reversed in the printing.

Mr. William England exhibited a photograph of Mr. Whiteley's establishment, taken a few days before it was burnt down. He also exhibited some views he had taken at Pangbourne while out with an excursion of the Camera Club.

Mr. A. P. Higgins exhibited some pinhole photographs.

Mr. W. E. DEBENHAM said that some very decent pinhole photographs had recently been published in *La Nature*, of Paris.

The CHAIRMAN remarked that spectacle lenses would, when stopped down judiciously, give photographs nearly as good as those obtainable with doublets.

Mr. HARRISON asked if good lantern pictures could be obtained from paper negatives.

Mr. J. B. B. WELLINGTON had never seen one so taken which was good.

Mr. F. A. BRIDGE had seen six very good ones taken by Mr. England upon Eastman's paper, not stripping films; the negatives were about half-plate size.

Mr. W. M. ASHMAN said that the pictures just mentioned bore projection upon a twenty feet disc.

Mr. ENGLAND remarked that their grain showed a little on the screen, but not offensively.

The HON. SECRETARY said that telegrams of congratulation had been sent from that Association and from the Convention to the American Photographic Convention sitting at Chicago.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE ordinary meeting of the above was held in the Free Public Library on Thursday evening, the 11th instant.—The President, Mr. J. A. Forrest, in the chair.

Owing to the hot weather and a number of members being on their holidays, the attendance was but small.

The Secretary exhibited a number of Muybridge's latest specimens of instantaneous photography, kindly lent for the occasion by Mr. J. J. Atkinson, of Manchester-street, Liverpool, which excited great interest, representing horses taken at racing speed, male and female figures, draped and nude, running, walking, jumping, &c. The action of the limbs as shown by the photographs quite upsets one's preconceived ideas of how they should be placed, and they are therefore of especial value to artists endowed with sufficient courage to depart from the conventional mode of depicting animals and figures in motion. Each plate had from twenty-four to thirty-six representations of the same figure, rendering it a simple matter to follow out the complete action of the limbs in running, jumping, &c., as the case might be; this is especially so when observed through the zoetrope, the figures and animals having then all the reality of life. Some thirty-six cameras are necessary to make a complete series—that is twelve of each of the three positions depicted, namely, front, back, and side views. The exposures are stated to have been the one-eight-hundredth part of a second, yet, rapid as this is, a wonderful amount of detail had been secured, speaking well for the actinism of the light in America, the same in England probably only giving a silhouette of the subject. To avoid vibration, the shutters are said to be quite detached from the cameras, and are fired by the object breaking fine threads across its path. Those interested in instantaneous work will shortly have an opportunity of hearing all about it *in extenso*, Mr. Muybridge being shortly expected in England.

The new Secret or Buttonhole Camera was also exhibited, and a developed plate with the six views it is capable of taking without being changed. They showed good definition, and rapidly moving objects were quite sharp. As was pointed out, there being no swing-back arrangement, the camera requires to be held quite perpendicular, or the lines of buildings, &c., will not be rectilinear. The conundrum of how this was to be remedied by an operator with an abnormal corporation was left unsolved, as was also the one of how to secure a developer which would exactly suit each exposure of the six on the plate.

Mr. E. Newall exhibited some interiors of a theatre by Messrs. Banks, Manchester, taken by the ordinary footlights and those at the wings. They showed good definition all over, and one, an imitation of a Turkish street scene, was most natural.

A member seeking the solution of a knotty point from the Chairman, gave rise to the advisability of having a question box; it was felt that novices might not always like a betrayal of their ignorance before the Society; and, on the proposal of the Secretary, it was agreed to that one be provided, and in future be on the table for the use of members, who are invited to use it freely, much information being often derived from discussing the failures of others.

The PRESIDENT showed a number of views he had taken at Ingleton and Vryny; the latter is the place where the Liverpool Corporation are, at immense cost, making their waterworks which are to supply the city. He stated that it was proposed to make a selection from these and others, with the object of having them bound with a *précis* sketch of the place and works, the whole forming an interesting *souvenir* for those interested in the place.

CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of the above Society was held on the 12th instant.—The President, Mr. S. W. Allen, in the chair.

The members were deeply interested in a demonstration given by Mr. H. J. ord, of the Camera Club, on the *Eastman Stripping Film*.

He said:—For the development of these films I find the soda and potash developer to be the best, though I have seen some negatives developed with ammonia as good as the best developed with soda. The formula which I find best is the one recommended by Mr. Wollaston at the Convention held last month at Glasgow, namely:—

	No. 1.	
Sodic sulphite.....		8 ounces.
Hot distilled water.....		40 "
When cold render slightly acid with citric acid, add one ounce of pyro, and filter.		
	No. 2.	
Sodic carbonate (washing soda) pure.....		3 ounces.
Potash carbonate, pure.....		1 ounce.
Water.....		40 ounces.

Mix equal parts of 1 and 2 for normal exposures. The development must be carried beyond the density usual for glass plates, as you must remember that the paper, which is only translucent, is afterwards removed. While these are fixing and washing I shall first prepare the glass on which they are to be placed, and then give you a *resumé* of the process. The paper is first coated with a layer of soluble gelatine, that is, just ordinary gelatine, and when that is dry it is coated on the top of this gelatine with the emulsion, which is highly chromatised, that is, rendered insoluble by aid of a chromium salt. After development, while the negatives are washing, and they need little washing before stripping, as you must remember that we are going to remove the paper which contains most hypo and wash the film from the back with hot water you prepare the glass to receive them by first coating it with a solution of indiarubber in benzole. This is to prevent the collodion from sticking to the glass, and need be only very thin; about one part of rubber to two hundred of benzole is quite sufficient. When this is dry the glass requires a coat of plain collodion on the top of the rubber, which is allowed to set, and then placed in a dish of clean water, and the solvents washed out. You must not allow it to set too much, or you will be troubled by the film leaving the glass before you want it to. When the solvents are all out, that is, when the plate does not appear to be greasy when taken out, it is ready for the film to be "laid" down on it. The plate is put in water, and the film floated over it face downwards in the same way as in carbon tissue. The two are brought into contact, removed from the water, and squeezed down hard. The plate, with the film attached, is then placed between dry blotting paper, and a weight placed on top of it. It is allowed to remain there for about fifteen minutes, when it is ready for stripping. To do this the plate is plunged in a bath of warm water about 120° to 150° Fahr., and in about two minutes, by rocking the dish gently, the paper will float off, when the film ought to be gently brushed with a camel-hair brush, and placed in a bath of cold water. This is the time to intensify or clear, if thought necessary. The next operation is to put on the skin: The plate is placed in a solution of glycerine and water, one to twenty, the skin submerged in this and allowed to soak until it is lined, floated over the negative, brought into contact, removed from the bath and squeezed down, when it is allowed to dry. When it is *perfectly dry* run a sharp knife round the edge and strip off; the indiarubber coating may now be removed by rubbing gently with the finger or a pad of cotton wool soaked in benzole. I shall end by giving a few general remarks. Before beginning to develop read the instructions carefully, and carry them out to the letter. Be in no hurry, but take plenty of time and think of each step before beginning it. And lastly, if you make failures, don't blame the film, but your own want of skill, and I am sure if you carry out the instructions you will not make failures but good negatives, and give up glass almost entirely, as I have.

Correspondence.

Correspondents should never write on both sides of the paper.

A NEW SEEKER.—DECORATION OF PLATINUM PRINTS.—AUTHENTIC NOTES ON DAUERRE PROMISED FOR "THE BRITISH JOURNAL OF PHOTOGRAPHY."

I HAD occasion to pay a visit to M. Chevallier, optician, and I saw a very ingenious lens intended to do away with the fingers placed upon cameras. In our days of instantaneous photography, when pocket, detective, automatic, and other similar apparatus come to light hourly, to get a shot upon a flying object is not above the intelligence of the happy owner of such a camera, but that the principal object be in its assigned place upon the negative is "*une autre paire de manches*," as is said in France. Many systems have been devised to show the fleeting objects to the operator so that he can seize the propitious moment to pull the trigger. I think that shown me by M. Chevallier is the simplest and cheapest I have hitherto seen. It consists of a piece of glass three-eighths of an inch thick in the form of a parallelogram, in height less than an inch; ground concave on one of its surfaces; more or less in depth according to the focus of the lens to be employed. This instrument shows when well chosen the exact resemblance of the objects produced by the lens in the camera. It is small, and convenient to carry in one's waistcoat pocket; it is enclosed in a thin brass frame; and can be fixed, either upright or sideways, to the camera at a moment's notice.

One of our leading photographers is having a certain success by printing his proofs in platinum and having them tastefully decorated in water colours. M. Reutlinger (that is his name) has a very pretty exhibit on the Boulevard Montmartre, which attracts legitimate attention and admiration.

Thanks to M. Nadsr and other gentlemen, I have been able to collect the portraits of the old French Masters and other interesting documents for the history of our art. In making inquiries, &c., for this purpose I

came across a gentleman, M. Nicolas Glaise, who writes me: "I have not the portrait of the tomb of Daguerre, erected in the cemetery of Bry-sur-Marne, which you desire; but I will return to that village to oblige you, and take a drawing of the monument, which I will send you on. Whenever any one occupies himself with that great artist, a personal friend of my father, I receive a double pleasure." This gentleman showed me a volume of the *Life of Daguerre*, in which were manuscript notes on the inventor of photography which have never been offered to the public. These notes I found so interesting that I solicited permission to translate and publish them in THE BRITISH JOURNAL OF PHOTOGRAPHY. This prayer was granted. Next week I will send them on to my readers.

59, Rue des Batignolles.

PROF. E. STEEBING.

PRINTING FROM GREASED PAPER NEGATIVES.

To the EDITORS.

GENTLEMEN,—I have lately taken a number of photographs on negative paper which I have had some difficulty in printing when greased, either from the grease soiling the positive paper or from the silver attacking the negative.

This difficulty I have now quite overcome by using one of Pumphrey's transparent films. By placing it between the negative and the paper it affords perfect protection to both, and in no way lessens the brilliancy and clearness of the photograph. The negatives can perhaps be printed without the application of grease, but the operation is such a tedious one that it is well worth the while to grease freely.

I believe stripping films have lately been invented, but as the process is somewhat complicated I, for choice, prefer the greased negative printed as described. The method is perhaps already in use, but in case it might prove of assistance to amateurs like myself, I give you my experience should you care to publish it in your JOURNAL.

I see numerous discussions regarding the merits of Glass *versus* Paper, but there can be no question that the ultimate decision must be in favour of paper.—I am, yours, &c.,

R. B. GRAHAM, Colonel.

Glenista, Cheltenham, August 11, 1887.

[The specimens enclosed by Colonel Graham quite attest the excellence of the system adopted by him, while the detail is as good as if the prints had been obtained from glass negatives. *Apropos* of separating the negative from the sensitive paper, it may not be generally known that Mr. Fox Talbot, in the very earliest days of photography, suggested the insertion of one or more thicknesses of paper or other diaphanous body between negative and print, in order to soften excessive sharpness in such places or subjects in which it was not desired.—Eds.]

A DISPUTED POINT IN DEVELOPMENT.

To the EDITORS.

GENTLEMEN,—It has been frequently asserted that, if a plate be soaked in plain water previous to the application of the developer, as some makers of plates direct in their instructions, the result will be a considerable retarding of the development.

I have had reason on more than one occasion to doubt the accuracy of this assertion, and only recently have had two very marked instances in exact contradiction. The first, a plain bromide emulsion made by a slight modification of my ordinary formula, proved to be extremely slow in development, until it struck me to give the preliminary soaking in plain water before commencing to develop, when, as I quite expected, that operation was greatly expedited.

More remarkable still was another emulsion, also of my own make, and containing a comparatively large quantity of iodide. This absolutely refused to show the slightest trace of an image until several minutes in the developer; but upon soaking it first the picture came up much more rapidly, the rapidity increasing as the time of preliminary soaking was increased. It is worthy of note that iodide should have a greater slowing effect upon development than bromide.—I am, yours, &c., DELTA.

[Our correspondent is wholly inaccurate in his conclusions, more especially in regard to the iodide, as he may possibly be led to believe on perusing an Editorial in another column.—Eds.]

WHAT IS THE CAUSE OF HALATION?

To the EDITORS.

GENTLEMEN,—Under the above heading in your issue of August 5, 1887, I see my name handled pretty freely by our friend "Monitor." As I presume he was not at the meeting of the Liverpool Photographic Society when the discussion on paper *versus* glass took place, I may perhaps be allowed to correct one or two items as given in the summary of the proceedings.

I am reported to have said that the film had nothing to do with halation, whereas I believe it has a great deal to do with it. What I said was that the nature of the material on which the sensitive film was spread had little or nothing to do with it; the cause in all the specimens there showed was over exposure, and that if a negative was taken of, say a window, for the window itself, and given the proper exposure, halation would not exist. But in order to obtain the interior or darker positions

of the building the window had twenty or thirty times its proper exposure, and on development halation showed itself. I maintain that, as far as the halation of the window is concerned, it is a clear matter of over exposure, and the fault would be further aggravated by the thinness of the sensitive film. If the film was of good thickness and of a dense, creamy nature the defect would be less apparent, whether on glass or paper.

But friend "Monitor" says the difficulty is to give the proper exposure to the glass roof and well lighted parts as well as to the darker portions of the picture. I see the difficulty in another light, namely, how to develop a plate, one portion of which has had thirty times its proper exposure in comparison to the other parts with one and the same solution, so as to give one the idea that the plate had been equally exposed.

Again, I did not say that the same amount of minute detail could not be obtained in a paper negative; but I did say that the same amount of fine and delicate detail could not be printed from a paper negative. And I say further, that I have yet to see the paper negative that will produce as good a lantern transparency or enlargement as can be produced from a good negative on glass.

May I make a suggestion as to the alleged greater rapidity of paper? Might it not be caused by the more equal and greater rapidity with which it can be dried after coating, as I have found in my experience the more equal and rapid the film is dried the more rapid the resulting plate? I presume paper would be attacked in the drying process from both sides.—I am, yours, &c.,

RICHARD CROWE.

FIFTY SITTINGS FOR A PORTRAIT.

To the EDITORS.

GENTLEMEN,—Your footnote to the above headed lines in last week's issue allow me to answer in the following:—When you say that you know of innumerable instances where painters receive assistance in their work from photographs, so can this only mean that a certain class of painters do exist who use photographs as a resource in executing their work; this I never did deny, but I pointed out such work as an imitation without any value relative to art. When names are mentioned like Sir Thomas Lawrence and Sir J. Reynolds, as it was the case in Mr. R. Barrett's article in connection with "Fifty sittings," &c., I think the idea not wrong that the talk concerns work of real artistic merit; then the only question can be, is it possible to paint portraits of artistic quality, as represented by the paintings of those named artists, quicker and without recourse to so many sittings as formerly, nowadays, with the aid of photography? And that is what I deny. But this is the assertion made by Mr. R. Barrett, and which provoked me to ask in what way is this suggestion to be accomplished? An answer in this direction, with the necessary distinct practical advice, would, I am sure, gratify many artists and—Yours, &c.,

Liverpool, August 15, 1887.

A PAINTER.

To the EDITORS.

GENTLEMEN,—I cannot understand Mr. R. Barrett's silence regarding your correspondent's question, "In what way a portrait painter may avoid or shorten the sittings nowadays?" and can scarcely think it inability. If, however, he declines the challenge, I will be very happy to answer "A Painter."—I am, yours, &c.,

Richmond.

ONE WHO FINDS PHOTOGRAPHY A HELP.

To the EDITORS.

GENTLEMEN,—By Mr. R. Barrett's silence I conclude he is unable to answer the question put in your JOURNAL by "A Painter." Can it be another example of a man laying down a theory on a subject he does not understand? No true artist would condescend to use photography as a help, and if he did it would only lead him astray. Photography is photography, but art is art.—I am, yours, &c.,

St. John's Wood.

AN ARTIST.

To the EDITORS.

GENTLEMEN,—In your last issue I have been brought to task by one of your correspondents, "A Painter," for not having answered a question put by him in a former JOURNAL under the above title. This same having its origin in my contributions on *Colouring as Applied to Photography*. If not too late, I think, I can satisfactorily, as well as *easily* (although he assumes my silence was the result of *inability*), answer his question.

The cause of my not answering it at once was ill-health, not having been able to read my JOURNAL, and so not seeing the "correspondence" on the subject, in the first instance. I am sure you will believe me, when I say that I would not for a moment withhold any little information that I may possess from any of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY. I will now try to answer the letter of last week, as it embraces all the qualities of the former one.

The aids of photography to a portrait-painter are *many*, so I cannot see where the trouble of my finding an answer could come in. I do not speak on the subject with a patriarchal experience, but I have been, all the same, closely connected with it for over twenty years. In the first instance, I have found people going to have a large portrait painted suggest to the artist that they would like it after the style of a certain photograph which has been regarded as successful by all their friends. In such a case, this photograph can be turned to account by the artist, and both help him in the drawing as well as in the preserving of many

details that would otherwise demand a sitting. This is in the case of an independent artist who may have no connection whatever with photography, but one who does not altogether eschew it. Of course, there are many artists like "A Painter," who will not accept the assistance of photography, such as Sir Frederick Leighton, or Sir John Everett Millais, and such conspicuous ornaments of a noble art; but there are also many exceedingly good men, upon whom fortune has not smiled so kindly, who are obliged to humble their pride and accept photography willingly as a help.

This will be more easily understood when I ask the question, "How many people, going to have a portrait painted, go direct to an artist, and how many have it done through a photographer?" I think the numbers will show favourably for the photographer. Now in these cases there are a series of pictures taken and proofs submitted for approval. One is selected for colouring, that is, for the portrait in question. Here the artist steps in and makes a minute entry of the peculiarities of drawing, and colour, &c., which will very rarely take over fifteen to twenty minutes. A transparency will be made from the negative, and by the aid of a Sciopticon, or magic lantern, a very correct tracing can be made on the canvas (I presume all this is saving the time of the sitter, I know it takes the artist nothing like a third of the time of a sitting). The colours will then be laid in and the portrait brought very near completion before one sitting has been demanded. And I have known artists, really good ones, who have in most cases been able to retain the image of the original so successfully as scarcely to require a sitting at all. This somewhat bears out what I said in my articles on "Colouring as applied," &c., but need not dispense with sittings altogether. Indeed, I think there should always be a few sittings before calling the picture finished.

I will just give one more instance before going to other portions of your correspondent's letter. Her Majesty Queen Victoria has commissioned an artist to paint Westminster Abbey as it appeared on Jubilee Day during the ceremony. What did the artist do? Well, he called in the aid of photography. The only reason I can assign for his so doing is, that he wanted photography to help him for the necessary sittings which he never would have been able to procure. If these few examples be not sufficient, I will be very happy to enter further into the matter.

As my opinion has met with a contradiction from "A Painter," I hope you will forgive me if I take exception at a few of his remarks and theories. He says, "A painter is bound to study with his own eyes the forms in combination with the many different shades of colours, and the transparent individuality of the skin, &c., to obtain a resemblance of nature in his picture." I never intended to convey the idea that by the use of photography a blind man could paint a portrait. But I do say that the artist who can see will save his eyes a deal of trouble by its use. Of the "individuality of the skin" being "transparent," I do not feel disposed to offer an opinion. He also says: "All painting done in another way can only be an imitation." Up to date I have always looked upon painting as more or less the art of imitating nature in colour. The more perfect the imitation was to nature, marking the degree of skill possessed by the artist. I also strongly deny his assertion that photography cannot be improved by retouching. He compares it to taking "out all the strokes of the brush visible in a painting and making a very smooth surface all over, but surely spoiling the peculiarity of the original." This theory might teach one that in painting portraits the same treatment may be used in the case of such a face as H.R.H. the Prince of Wales, as on that of "the Deaf Boatman." In painting, as in life, we have the smooth and the rough, and should know how to treat both. Some articles appeared on retouching in the JOURNAL some time ago in which the writer's views were moderately clearly stated, and I feel sure the writer of them will be able to justify them if needs be, as I am always ready to uphold the fact that photography is a considerable aid to the modern artist.—I am, yours, &c.,
REDMOND BARRETT.
London.

BACKING PLATES.

To the EDITORS.

GENTLEMEN,—Some time ago I made a cement for microscopy, consisting of asphaltum dissolved in burning naphtha, but it did not answer for that purpose, so put it on one side. It answers, however, capitally as a backing for plates, being easily applied, quickly drying, and easily removable. I do not put it all over the plate, but only upon the upper half, and do not remove it until after development. Its presence does not affect the development in the least.

I take the bottom off a grooved negative box, allow the box to rest on two pieces of wood inside a large box with a lid, which is not closed down, the backed plates are put inside the grooved box, and the whole covered with a carriage rug; this arrangement allows of the plates properly drying, and can be performed by any amateur who possesses a dark room or cellar without any risk of fogging the plates.

The proportion of asphaltum to the mineral—not wood—naphtha is about one in six, and I like it better than Brunswick black, which will do, however.

My justification in troubling you is, that this communication may be serviceable to some of your readers.—I am, yours, &c., C. F. JARVIS.
Hantsworth, August 17.

EXPOSURE TABLES.

To the EDITORS.

GENTLEMEN,—By the articles contained in the last few weeks' editions of your excellent JOURNAL, it appears to me that the art of photography is fast resolving itself into a mechanical science—is, in fact (to be paradoxical), settling into a state of unsettled complexity. I will not waste your time by enumerating all the reasons that impel me to make this assertion, but will be content with stating just one. It is relating to that portion of our art, namely, the correct exposure of gelatine plates. In these days of progression it is an undoubted fact that whenever a new idea is put forward that bears upon the face of it a faint possibility of overcoming certain difficulties which hitherto have had to be contended with, infatuated and indiscreet persons seize hold of the said idea, and look upon it as a satisfactory ending to all their past troubles, and a reliable forerunner of future successes. This forcibly applies to the present popular system of using actinometers and "Comparative Exposure Tables." I do not deny that this system is of use to the amateur, who, for the most part, depends upon scientific principles for the production of scientific results; but to the professional, to whom photography is (or should be) an art, the system is not only useless, but misleading. I have in my possession no less than six "comparative" tables compiled by various mathematicians; I have worked by each of these separately, and by computations made by their combined aid, but I may truly say that the negatives taken in each case were not (as I considered) so correctly exposed as those whose exposure depended on my experience alone. I do not endorse the opinion of some who assert that gelatine plates possess an enormous latitude, but I do opine that they do possess a certain amount of latitude, and when an individual has expended years to acquire an experience and a judgment so accurate as to enable him, under any condition of light, and without recourse to any mathematical rules, to bring his exposure within that latitude, is it not the height of absurdity for that individual to throw aside this extremely valuable acquirement and adopt in its stead a system which, if it does occasionally succeed, on the whole leads him into more blunders than would occur without its use?

There are some, perhaps, who will say, "Is it not by this system that we acquire this same experience?" To such persons I would quote the following fable:—"A dog, holding in its mouth a piece of flesh, was crossing a bridge, when he saw his shadow reflected in the water. Impelled by greed, he made a dart at the reflection, and by his eagerness lost the genuine piece of flesh which he had." Does not this apply to those individuals who, having acquired the experience I speak of by devoting their time to the study of these "mechanical aids," grasp at the shadow of a higher experience, and by their indiscreet energy, lose the genuine experience they formerly possessed?

But, gentlemen, I must crave your pardon for carrying this subject so far. Before I conclude, however, I will venture a word of advice to amateurs. If perforce you must adopt some mechanical system, ascertain by the little experience you possess the most serviceable and correct one, then stick to that, and that only, relying not so much upon the rules themselves as on the experience you may happen to gain by the use of them.—I am, yours, &c.,
W. INOLES ROGERS.
St. Germans, August 16, 1887.

AN EXPLANATION.

To the EDITORS.

GENTLEMEN,—What I write about will unfortunately be a very old affair by the time this reaches you, but I ask you to let me have space for a word of explanation. It has reference to the report in your paper of the more than kindly way in which I was entertained by photographers in New York. I am reported to have said—or, rather, the report gives the impression that I stated—of English photographers, that they were more reticent in communicating their experiences to others than were American photographers. Now this is scarcely true, although I found American photographers quite as willing to impart information as English, and I did not say it; or, rather, let me say I had certainly no intention of saying anything of the kind. I gladly, however, take the blame of any ambiguity on myself. The comparison I drew had regard to non-technical matters—to hospitality, I mean. I do not believe that an American photographer, a total stranger, would be received in England with the overwhelming hospitality with which I was received in New York. The English—particularly Londoners—are, to strangers, probably the least hospitable people in the whole world, with the exception of the Chinese.

Another thing I said—also quite true—was that, contrary to expectation, I had found amongst American photographers much less of what I can only term "bounce" than amongst English. There are one or two English photographers I wot of, concerning whom it might be said that, were a stranger to be conveyed into the society of one of them, to spend a day in that society, and then to go back to his native land, having seen no other photographer, he would return with the conviction that to the individual he had seen was due the credit of every improvement that had ever been made in photography, if not, indeed, the invention of the science itself. Of course, it may only have been due to my brief stay in America that I found no such individuals there. At any rate, I did not find any.—I am, yours, &c.,
W. K. BURTON.
Imperial University, Tokio, Japan.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED.—

J. H. MAAN, Sandall, near Doncaster.—Landscape photograph of Rothe Abbey, near Doncaster.
Hopkins Brothers, Hoddesdon.—Eight photographs of Hoddesdon on Jubilee Day, June 21, 1887.

WILLIAM A. BRICE (Geneva).—The matter is receiving careful consideration, and you will be communicated with privately.

J. E. GOWER.—The tentative system adopted by you, if carefully carried out, leaves nothing to be desired. Unless the salts are chemically pure it would be of no use to give definite proportions.

G. A. TURNER.—The process known as "lichtdruck" in Germany is simply what is known in this country as the collotype process. This process here passes under several different names, according to the fancy of those who work it.

A. VOSEY.—Platinotypes cannot be produced on highly albumenised paper so as to have the appearance of silver prints with the stability of platinum. Vigorous negatives are necessary to produce vigorous prints by the platinum process; weak and foggy negatives are unsuitable.

W. L.—We should not advise you to tamper with the carbon enlargement. It is more than doubtful if you will be able to reduce the print by treating it with very hot water. Certainly you will not if it has been alumed and the aluming action has been complete. Your best plan will be to get a lighter print made.

W. G. O.—Any of the photographic dealers at the places you stop at will supply you with dry plates. Perhaps, however, at some of the minor places they may not keep all brands, and you do not say which you will require. Would it not be better for you to take a full supply with you, so as to make sure of getting what you want?

G. Y. G. sends us some transparencies on glass in platinum. This is the second time this correspondent has sent us examples by the process. Those now sent are certainly an improvement on the previous ones. If our correspondent will send us the method by which they were produced we shall have pleasure in publishing it; he will then secure the credit of his invention.

H. B. writes: "I have a lot of plain photographs, and wish to mount them in a scrap album. Can you inform me, through your JOURNAL, how to make a mountant that will not cockle them?"—The best mountant for the purpose is a solution of gelatine containing a large proportion of alcohol. The gelatine is best suited for making the solution is that recommended in a sub-leader last week.

LOLA.—For the over exposed plates already developed—rather than incur the risks of intensification—it will be better to make another negative through the agency of a transparency. But thin negatives of this class may be made on bromide paper taken with a brief exposure and a long development. As for the undeveloped plates, they can all be made to yield good vigorous negatives by a liberal employment of bromide in the developer and reducing the alkali to a minimum.

SIR DAVID SALOMONS sends us a capital photograph of the arc light, which shows very distinctly the form of the incandescent carbon. He also furnishes the particulars by which the picture was produced. He says: "Enclosed is a photograph of the 'arc' of an arc lamp burning with a current of twenty amperes (namely, about two thousand to five thousand candle power). Exposure was four seconds; intensity, one hundred and twenty-eight by Dallmeyer standard. The result was accomplished by transmitting the rays through a polariscope before reaching the lens. The lens was sixteen inches from the 'arc.'"

A. H. DEATH writes: "A few weeks ago I was requested by the owner of a painting to photograph the same. This was done and prints supplied, and on offering to give the negatives up I was told I could retain them and make what use I pleased of them; consequently other prints were taken off and exhibited for sale. Now the artist (who sold the painting to my customer) says I am not within my legal right in thus exposing the prints for sale, and demands their withdrawal; but before doing so I wish you to inform me whether I have done wrong or not in selling those copies."—In reply: An artist may sell a picture and still retain the copyright in his own hands, as a separate and independent property. It is possible that he has done so in this case. This you can ascertain from the owner of the painting.

J. G. BRADEN writes as follows: "Would you kindly tell me where I am at fault in the following matter?—My favourite toning bath used to be the acetate, latterly I have come to grief in this way: I make a bath of one grain gold chloride, thirty grains soda acetate, and water, eight ounces, keeping it at least eighteen hours before use; after toning one half-plate print and putting aside for further use I find my gold all gone down and the solution of a deep blue colour, refusing to tone again. I have tried distilled water and obtained the purest acetate, but with like disappointing results. I have also treated the prints after washing to a soda bath, but with the same effect."—Clearly something has been introduced into the bath, probably with the print, which has caused the reduction of the gold. If a toning bath be exposed to light that will in time bring about a precipitation of the gold. This may be the case in the present instance.

G. A. C. says: "Recently I had occasion to intensify a thin negative, using bichloride of mercury, iodide of potassium, and afterwards a weak bath of ammonia as usual; it was then put away to dry, which it did, with the exception of some streaks where the water seems to have collected in or under the film. Being in a hurry, the drying was hastened over a gentle heat, but when this was done the streaks where the water bubbles had formed were almost clear glass, even on parts which were comparatively dense, and they required retouching with brush and pencil before anything could be printed from the negative. Can you assign any reason for this? I think, myself, the hastened drying had much to do with it, but why?"—The reason is not far to seek. The film where there were streaks and bubbles evidently contained sufficient water to bring the gelatine into a state of solution, hence on applying heat the image there became disintegrated.

B. CLEWS.—So far as we know, the process, or anything analogous to it, has not been patented. However, there is no novelty in it. Thirty years or more ago it was worked, though only to a limited extent.

PUZZLED writes as follows: "If you could give me your opinion on the following case, I should feel much obliged:—A lady anxious to have a photograph of her grandchild has the little one photographed without the knowledge or consent of the child's father (the child alone as well as with herself). The father of the child coming to know of it (the mother is dead) prohibits the photographer from printing or supplying any of the photographs, but is willing to pay expenses. The lady does not see why she should not have photographs, though the child is on her knee; and the child's father is equally firm she must not have a photograph of the child. Meantime the photographer retains the negatives, and refuses to give prints from them to any party. I would ask—1. Can the grandmother claim to have the photographs? 2. Can the father legally prevent? 3. Can the photographer retain the negatives and refuse to supply prints from them to either party? Or, 4. What would be right to do in the circumstances?"—As the matter stands we know of no law that will meet the case. The father clearly has no copyright in his child's face. The one who commissioned the photographer appears to be the one entitled to the portraits. We leave this knotty question open to the opinions of readers, some of whom may have had similar experience.

UP till going to press we have not received from the engraver the key block of the Convention group we promised for this issue.

THE *Indispensable Cyclist's Handy Book* is the title of a most compendious work on bicycling by Henry Sturmy (London: Liffé & Son, Fleet-street). It forms a complete cyclopaedia, and is profusely illustrated.

H. R. H. PRINCE ALBERT VICTOR gave Mr. Bassano sittings for photographs at his studio in Old Bond-street on Monday morning. Some very successful negatives are said to have been taken of His Royal Highness.

FROM Messrs. Bernstein & Vogt, 28, Jewry-street, E.C., we have received sample sheets of their improved Dresden double extra brilliant albumenised paper, which we find on trial to bear out all that they allege in its favour.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting of this Society will take place Tuesday next, August 23, at eight p.m., at the Gallery, 5a, Pall Mall East. Doors open at seven for reading and conversation.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, August 24, 1887, will be on *The Production of Transparencies*. Saturday outing at West Drayton. Train, Bishop's-road at eight minutes past two.

ROYAL CORNWALL POLYTECHNIC SOCIETY.—The Exhibition of this Society opens on September 6, therefore it beloves those who intend exhibiting photographs or appliances to be getting ready. Particulars will be found in our advertising columns.

A COPY, "With compliments of *Anthony's Photographic Bulletin*," has been received of a memorandum book which, we learn, was presented to each visitor at the Chicago Convention of the Photographers' Association of America by Messrs. E. & H. T. Anthony & Co., of New York. It forms a useful little pocket book.

ONE of the most charming pictures that we have seen for some time has been received from Mr. John M. Skinner, of the Albion Albumenising Company, Glasgow. It is an enlargement from a small negative taken by Mr. Skinner on the occasion of one of the excursions (that at Largs) of the Photographic Convention, and represents the champion yacht "Thistle" careening over a calm sea, the wind being but light.

MESSRS. M. & T. SCOTT, photo-enlargers and finishers, 36, George-street, Edinburgh, have sent us a specimen of a new style of photo-etching they have introduced. It is a platinotype enlargement from a cabinet portrait, and is of a very warm tone. While it is unmistakably a photograph, yet is it etched most skilfully and elaborately, so much so as to be entitled to take rank among works pertaining to the etcher's art. It is, indeed, a happy combination of the two arts. The subject is a weather-beaten old man, whose rugged features lend themselves well to this class of treatment.

HONOUR TO AN OPTICIAN—SIR HOWARD GRUBB.—The honour of knighthood conferred on Mr. Howard Grubb was yesterday everywhere throughout the city spoken of with gratification. It was recognised as a compliment to science, and an acknowledgment of the recipient's high attainments therein. It may not be known to the general body of the citizens, though of course it is well known to all scientific men, that Mr. Grubb so far back as 1870 was elected a Fellow of the Royal Astronomical Society. In 1872 there was added to this distinction that of Honorary Membership of the Royal Institute of Civil Engineers in Ireland. In 1876 Mr. Grubb was presented with the Mastership of Engineering (*honoris causa*) by the University of Dublin. And this does not exhaust the list of the honours bestowed upon him by the magnates of science. In 1881 he was given the Cunningham Gold Medal of the Royal Irish Academy—a very high reward and proof of eminence; and, lastly, in 1883, he was elected a Fellow of the Royal Society. It will thus be seen that Mr. Grubb's knighthood represents no mark of accidental favour, but is such a recognition of his scientific abilities as will be accepted by the scientific world as a suitable and just endorsement of superiority and genius.—*Irish Times*.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1425. VOL. XXXIV.—AUGUST 26, 1887.

THE EFFECT OF QUANTITY OF SOLUTION ON DEVELOPMENT.

BEYOND an occasional passing thought on the subject of comparative economy, it is to be questioned whether one operator in fifty ever gives the slightest attention to the probable effect exercised upon the character of the negative by the quantity of developing solution used in its production. Perhaps even when the matter is thus put before them for the first time there will be some who will pool, pool, the suggestion, and pass it off with a smile of incredulous superiority, as being quite too ridiculous to occupy a moment's thought. Such individuals notwithstanding, let us for a few minutes consider what effect the volume of developing solution may have upon the resulting image.

In this consideration we put entirely on one side the element of economy which we must naturally expect to prevail in most quarters, though not certainly to the same extent at the present time and with pyro at a shilling an ounce as ten years ago when gelatine plates were young and English pyro sold for three shillings and sixpence. Then the item of pyro formed a very serious charge upon the photographer's pocket, for not only was it far more expensive than the iron developer to which he had been accustomed with wet plates, but it had to be used in far greater proportionate quantity, ounces being required where drachms had formerly sufficed. We say advisedly "*had* to be used in greater quantity," for if it had been found possible to develop without the aid of the dish many would have been the early gelatine converts who would gladly have availed themselves of the facility. It was not to be so, however, and they were compelled to forego the pleasure of limiting the quantity of solution; but as the mountain would not go to Mahomet, that individual in the natural course of events proceeded to the mountain. The extra demand for pyro was rapidly met, and as rapidly the price came down, until at the present time the cost of the pyro developer has ceased to be the serious matter it formerly was.

The prime reason for not discarding the developing dish, or rather for having recourse to it in the first instance, was the impossibility of keeping a small quantity of solution evenly spread over the surface of the gelatine plate—a matter of the greatest ease with collodion. The refusal of the developer to flow led to great irregularity in the formation of the image, to streaks, stains, and smears innumerable, so the dish had to come into general use. Even then those economically inclined did their best to get along with the smallest possible quantity of solution, a quantity insufficient to cover the whole film at once, but which, by dint of vigorous rocking and agitation, was made to traverse every portion of the plate at pretty

regular intervals and with tolerable uniformity. But then other troubles arose; the developer became literally so "lashed into foam" that the resulting markings from air-bubbles constituted a fresh subject for serious consideration. Then, again, it was realised that the fierce agitation to which the solution was subjected, by bringing it so much more into contact with the atmosphere, caused its speedy oxidation and discolouration, and this, taken in connexion with the exposure of the film itself to oxidising influences in the intervals when it was not covered with solution, led to the staining of the gelatine a most uncompromising and inconvenient brown. As this was prior to the days of the sulphite developer and clearing solutions, it proved effectual in calming the last struggles for economy of pyro.

These possible results directly attributable to the volume of solution having been enumerated, it may be said that we have exhausted our subject, but we think not yet. Let us turn back to former days and see if we find any analogy in wet-plate development. The circumstances and conditions were, we grant, quite different, but they will serve our purpose and lead us to show where even with alkaline pyro or ferrous oxalate an important and perhaps still greater influence is exercised by the mere quantity of solution applied to the plate.

If we inquired of some of our old wet-plate readers what would have been their course of procedure in developing a subject in which it was necessary as far as possible to subdue the contrasts where, in fact, it was the object to gain a soft result by artificial means, the reply would, we fancy, be unanimous: a large quantity of developer would be used, flooded quickly over the plate, and a portion of it allowed to escape over the edges of the glass. Conversely, where the object was to get as much contrast and density as possible, the quantity of solution would be kept at the minimum and the plate rocked as carefully as a sleeping babe, to avoid losing a single drop of the precious fluid. What is the *rationale* of these modes of treatment? Simply this, that the silver solution adhering to the plate after its removal from the bath is the agent that gives force to the development, and, consequently, by diluting it with a large quantity of iron solution and allowing some of it to escape, the character of the image becomes less vigorous, while, on the other hand, by concentrating it as far as possible, by using a minimum of iron and retaining every drop of silver on the film, the greatest amount of density is attained that the plate is capable of giving.

Another practice amongst expert workers when aiming at similar results was to rock the plate constantly where contrast was sought, or to allow it to remain stationary when softness was desired. The explanation of this procedure was that when

the solution is allowed to remain quiescent upon the film those portions of the latter which have been more fully impressed by light rapidly attract to themselves the silver in the layer of solution in their immediate vicinity and quickly exhaust it, arriving at their maximum effect before the half tones and shadows have, in their more leisurely manner, taken to themselves the quantity of silver they require. The lights are in fact held back, from the mere absence of silver to increase the depth of the deposit, while the half tones are slowly gaining strength, and when the latter have reached the proper point the developer with its unreduced silver is poured away. But if, instead of allowing the plate to remain still, it be constantly rocked, the solution is kept thoroughly mixed, and as rapidly as the high lights extract the silver from the solution for the time in contact with them it is replaced by more from the surrounding portions, and they go on acquiring density by a species of robbery of the half tones and shadows, and so contrast is increased.

It can be readily seen from what we have said that the quantity of developer has, here, a very important bearing upon the character of the image; it has, in fact, precisely the same effect as the addition or omission of a certain quantity of one of the most important agents in the reaction. For clearly the application to a wet plate of half an ounce, instead of two drachms, of developer would have an effect in every way tantamount to adding one grain of silver to the ounce instead of two if the silver had to be added in that manner, instead of being already on the film; or it would be similar in its result to using a one grain solution of pyro in place of a two grain in modern development. It may be surmised, as a corollary to the above, that if an infinite quantity of solution could be applied to a plate and instantly mixed with its silver, the result, so far as development is concerned, would be practically *nil*, as it would be equivalent to washing out all but the most infinitesimal trace of the silver required to build up the image.

After this we are quite prepared for a chorus of corrections, and fully expect to be reminded that there is no free silver to be dealt with in the case of a dry plate; that as the developer is made up to a definite formula and does its work without any extraneous assistance beyond the previous action of light it matters not whether a drachm or a gallon be employed. To put it plainly, we expect to be reminded that the alkaline developer or ferrous oxalate is practically a one-solution developer, while the iron developer is virtually a two solution, since it derives its silver from the silver bath, and that the dry plate developer consequently works independently of the plate. Does it? We shall see.

Before going into any explanations on the subject, let us first try the simple experiment. Let us expose a plate and cut it in halves. We will mix ten ounces of developer, let it be alkaline pyro or ferrous oxalate, it matters not so long as it is mixed complete and is perfectly uniform throughout the bulk. Now we will divide it into two unequal portions—two ounces and eight ounces—and immerse in each one half of the exposed plate. With the exception of the difference of quantity let the two plates be heated in precisely the same manner, rocked simultaneously, and the solution poured off each at the same time. Surely if there were any truth in the allegation that the volume of developer mattered nothing we should have two identical images so far, at least, as character goes; but what do we see? Well, simply that the half plate treated with the smaller quantity of solution exhibits more contrast than the other; we do not say that it is denser—it may be it is less

dense—but there is more clearness in the shadows and less vigour in the finer details. There may be quite as much shadow detail visible in the one as in the other, but in the half treated with the greater bulk of solution it has more printing value. Repeat the experiment with varying quantities, the result is always the same, and though the difference may not sometimes be great still a difference there is.

Let us try another experiment. Expose and cut a plate as before and immerse the halves in separate *equal* quantities of the same developer, but during development allow one dish to remain perfectly still while the other is constantly rocked. Arguing on the analogy of the wet plate under similar conditions, the rocked plate should be strong and vigorous and full of contrast while the other should be softer and more harmonious. We do not find these characters, however, quite borne out, for though the rocked plate may be vigorous and satisfactory as a negative should be, the other presents a miserable image that is neither vigorous nor soft, but apparently a hopeless case of under exposure.

The last experiment will help us to point where the discrepancy lies. In the case of the wet plate the greater softness resulting from permitting the plate to lie still during development is attributed to the more rapid exhaustion of the silver in contact with the high lights; the same argument may be applied in this case, and we can suppose that exhaustion of the solution would have the same effect. But it has not. We imagined a short time ago somebody informing us that the dry plate developer works independently of the plate; it does not, for though, as we have already said, the circumstances and conditions of wet and dry plate development are quite different, still in each case the developer as applied to the plate derives *something* from the film itself—silver in the case of the wet plate, bromine in that of the dry. In one instance an aid to the formation of the image, in the other a check or retarder.

Now, in the case of our last experiment, the explanation is plain enough, and the necessity for at least gently rocking the plate during development is shown. Not only does it renew the exhausted developer by bringing fresh solution into contact with the film, but it removes and dilutes the evolved bromine, which would otherwise react directly upon the undeveloped image. Such is, indeed, the explanation of the behaviour of the unrocked plate; no sooner is a visible image produced but the energy of the developer is weakened or altogether destroyed. At the same time a quantity of bromine is evolved from the reduced silver bromide, and this, in the absence of any alkali to combine with, remains in contact with the film in the form of hydrobromic acid—not only a restrainer, but a destroyer of the action of light. This, then, suffices fully to explain the result, and especially the difference in the behaviour of wet and dry plates respectively.

Turning to the first experiment, which more immediately bears upon our subject, we have, of course, again to deal with the liberated bromine, but in this instance the effect resolves itself simply of more or less additional restraining power. In the experiment quoted, supposing that we started with an entirely unrestrained developer, the smaller quantity would, at the finish, and at every stage of development, be precisely four times as heavily restrained as the other, since the same quantity of liberated bromine (converted into bromide) would be concentrated in one-fourth of the quantity of active solution.

We have overstepped the space at our command already, or should proceed to show where this question of quantity chiefly bears upon actual practice, but this we must defer. We have

said that the difference, even in an extreme case like our experiment, may not be great, but, as we hope to prove, there are circumstances under which the variation of the quantity of the developing solution may play an important part.

THE COLOUR OF SILVER PRINTS.

An interesting example of the change of taste that all things artistic are liable to be influenced by may be seen in the characteristic "tones" or colours of the silver prints of the present day. About a quarter of a century ago, when negatives of extreme density were the rule, the prevailing colour of almost all albumenised prints, toned by the alkaline bath, was a purplish black; or, perhaps, we should say, that colour was the one usually aimed at by the printer of the period. Within the last ten years a complete change in the colour of prints sent out by the average photographer has taken place; the production of purple tones is now far "more honoured in the breach than in the observance." The question whether caprice and the desire for change, or some action of a more occult character, may be suggested as the motive cause, comes readily forward. Our own opinion inclines to the explanation being found in a combination of reasons.

The desire to bring something new before his clients may well be supposed to actuate the professional photographer, and, no doubt, it does, thus explaining one of these causes. We are most inclined, however, to the opinion that the chief one lies in the difficulty of uniformly attaining the purple tone in the bulk of the prints turned out by any one establishment. A glance at our correspondence columns suffices to show how frequently the photographer fails to realise the fact, that unless the negative be good the prints from it will not be good, or, to speak still more pointedly, that the tone of a print is governed to a great extent by the *timbre* of the negative from which it is obtained.

Since the introduction of gelatine plates the class of negative produced has undergone a radical change, delicacy rather than force now characterising them, while a tendency to the once hated fog has been so very common that a little fog more or less has come to be looked upon as almost a necessary evil—"fog," that is, as it would be called by an old hand at wet plate work. Now as the very essence of the once admired effect of the purplish black is force and brilliancy as opposed to an excess of softness and delicacy, it is quite natural that with plates of the latter character other "tones" should be chosen, and such, as our readers are aware, has been the case.

But beyond this, the albumenised paper manufacturers, seeing the growing taste for warmer tones, have gradually arrived at a process of manufacture which enables them to turn out a class of paper upon which it may be said that, practically speaking, it is next to impossible to obtain purple tones. We once heard an experienced photographer say, "Any one can get brown tones; it takes a good workman to get a rich purple on his prints." We have thus, through the influence of the paper maker, a very cogent reason for the abandonment of the cooler range of colours. We do not say total abandonment, for there is still a band of workers, most, if not all, of them old photographers, who even yet are staunch adherents of this old favourite.

Granted, however, the production of negatives from which nothing but cold and leaden-hued prints could be obtained, the establishment of another range of colours rich in their own way would naturally be an object with good workmen, and we have seen such colours hold the field for years past. Our

own opinion is that—using a negative that is suitable—the purple-toned prints afford greater range of effects and greater brilliancy, richness, and force than any other colour since chosen.

Still more lately there have been produced pictures of a very fascinating character, in which the colour is about the furthest remove from purple that a silver print is capable of exhibiting. The pictures in this "tone" that we are thinking of already before the public are of considerable artistic merit, hence we may safely predict that there will be a run upon it for a time, as the attractiveness of the portraits will be set down, in a general way, by the unthinking, as being due to the colour of the prints and not to the artistic skill of their producer.

In regard to the mode of obtaining such tones—as to which we have already been asked for instructions—it may be said that most of the old baths when in good working order will be capable of producing them. The toning bath, perhaps, least adapted is the chloride of lime bath. This particular toning solution is, we are inclined to believe, the most difficult of any to attain proficiency of working with; but, given a good negative, a solution in proper order, suitable paper, and an experienced hand to work it, prints of a quality more approaching to that of an engraving than is attainable with any other formula can, we are of opinion, be produced.

There is, of course, always to be found a class of negatives which, whatever colour the photographer may in an ordinary way require, will always be most effective when printed in warm tones, and when a bath chosen for its suitability for purple tones is employed a considerable degree of under toning will be desirable for these warm colours.

If warm shades alone be affected we cannot advise our readers better than to stick to the old acetate bath made of about twenty grains of acetate of soda added to a grain of recently neutralised chloride of gold with plenty of water. The latter is a most important matter: it is most difficult to get uniform warm tones with a bath that tones the pictures in a minute or two; more than that, the most delicate and even colours cannot be obtained rapidly.

One of the most remarkable additions possible to the range of colours was shown to be within our power when the "burnisher" was first introduced, and, indeed, we are not at all sure that the introduction of this instrument did not aid more than any other cause in sounding the death knell of blue-toned prints.

The advantage to colour producible by the aid of heat had long been known, but it was reserved to the introducers of the "burnisher" to show the most remarkable difference which heat could produce in an average print. It gave so great a richness and transparency to the shadows, combined with a general enriching of the whole effect, even with an indifferent print, that at one time almost every one burnished his prints. The extreme gloss given to the surface was by many supposed to be the cause of the improvement, and for many years the majority of *cartes-de-visite* produced in this country were burnished. When cabinets became more general, burnishing fell out of use to a great extent; now we are promised another reign of the hot iron.

This latest colour—that promises to become fashionable—is still more inclined to yellow than to ruddy brown, and to obtain it the photographer must either not tone at all or else give his prints a mere dip into the bath. But, above all, he will have to burnish. An acid floating bath is here of little harm,

if, indeed, it be not a positive advantage, and the negative may be very thin and still allow beautiful prints to be obtained from it.

The artistic mind tends to revolt against the garish effect of a highly "burnished" print, but, seeing that the gloss and the amelioration of the colour are inseparable, we are afraid that protest will be useless. Let, however, every one try to put his whole mind into his work, and he will reap the reward in an appreciative *clientèle*, and let him remember that the colour of a print is but one—a minor—condition of artistic expression.

FROM accounts which have reached us up to the time of writing, photography with the eclipse expeditions has not been so successful as could have been desired—at least as far as Europe is concerned—owing to the condition of the atmosphere at the time. In Prussia and in Austria we learn the results have been unsatisfactory. Russia, on the whole, seems to have been better favoured, as a report from there says that two or three good negatives of the corona have been secured. It is indeed a disappointment when great preparations have been made, heavy expenses incurred, and hundreds, perhaps thousands, of miles travelled, to have the whole object frustrated by a few heavy clouds. Such circumstances, unfortunately, are by no means unknown to scientific men in connection with eclipse expeditions.

SINCE the Abbé Larrieu issued his pamphlet in Paris alleging that the Great Wall of China has not, or ever has had, any existence except in the imagination of writers and travellers, considerable discussion on the subject has taken place here as well as on the Continent. Several letters have appeared in the daily papers from persons who have actually seen the wall in different places along its length. One correspondent says that he is in possession of a photograph of the wall which he purchased in China about a quarter of a century ago, taken by that well-known artist Signor Beato. A number of photographs of the wall, if they were forthcoming—and they should be—would prove more conclusively the fallacy of the Abbé's pamphlet than any amount of correspondence, however well it may be authenticated. In discussions of this kind photography is a better witness in the opinion of most people—and carries greater conviction with it—than the mere testimony of eye-witnesses.

THE production of a reversed negative, suitable for some of the photo-mechanical processes, sometimes proves troublesome to the ordinary portrait photographer. If he happen to be provided with a prism or a reversing mirror the thing is simple enough, but this is seldom the case; or if he have the materials to hand for working the wet collodion process, which few have nowadays, it is easy to take the negative on a waxed plate, or one treated with French chalk, and then to transfer the film to a sheet of gelatine. The most general plan now adopted is to take the negative on a dry plate in the ordinary way and then to reproduce it reversed in the copying camera. Now, however skilfully this work may be carried out, it is seldom that the reproduction comes up to the original in quality. In Germany, and other parts of the Continent where mechanical processes—collo type in particular—are more general than here, and also in America, dry plates, prepared so that the film can be easily removed, are regular articles of commerce. Here, we suspect, the demand for stripping plates would be so limited that it would scarcely pay English makers to put such plates into the market. However, the thing might be worthy of consideration.

ONE of the simplest, and at the same time best, plans open to those who are not in possession of either of the above means of obtaining reversed negatives, is to take advantage of the Eastman stripping films. With these, when used for our present purpose, the negative is taken in the ordinary way, developed, fixed, and washed. Then a glass plate is coated with plain collodion, plunged into water, and as soon as the ether and alcohol are removed, the wet negative is squeegeed down upon it. After resting for a short time the plate is placed in warm water, when the paper comes away, leaving the image attached to the glass plate. We have here a reversed direct negative on glass

as good in every way as if it were taken on a dry plate, and in printing from it there is no intervening film to interfere with the sharpness of the image. There is yet a further advantage in this method of procedure, as the negative may be made to serve a double purpose. If the glass be rubbed over with French chalk, previous to coating it with the collodion, then, when the negative has served its purpose as a reversed one, a pellicle of gelatine can be applied, after which the negative can be stripped off from the glass and utilised for silver or platinum printing.

AN excellent opportunity was afforded during the severe storm last week for obtaining photographs of lightning. Seldom, indeed, has such a chance occurred, the night being dark, and the lightning unusually brilliant. Those who watched the storm could not but be struck with the great dissimilarity in the appearance of the flashes with most of the photographs which have from time to time been exhibited. Indeed, no two discharges appeared to the observer to bear any relation whatever to each other, either in form or the direction they took. A photograph of lightning at the instant of its "striking" an object, as in the case of the church in the neighbourhood of Long Acre, would be exceedingly interesting and extremely valuable from a scientific point of view. Such a photograph would, doubtless, show the lightning very differently from what it is depicted by artists in a painting of a thunderstorm.

AS might be expected, we have received several photographs both of the lightning itself and its effects produced during the recent storm. One of the former is by Mr. Joseph Gray, who has secured a most eccentric flash, more so than we have ever seen; another by Mr. Brebaza shows the interior of a studio as displayed by an exposure of twenty minutes during the storm.

OF late years photography has been largely applied in the production of Christmas and New Year's cards. Those who intend to make a speciality of it this year should lose no time in getting up their specimens. Of course, we are not alluding here to those photographic cards which are supplied by the wholesale houses to the retail stationers, as with these the latter have already laid in their winter stock. The kind we allude to are those supplied by many photographers in the provinces of local scenery taken by themselves, and mounted on neat cards bearing seasonable greetings. Already we have seen some capital examples of these in the window of a photographer in a country town. A photograph of a well selected view taken in the neighbourhood of the sender's abode, or, perhaps, better still, the portrait of the sender, accompanied by seasonable wishes, would generally be more acceptable than the majority of cards now in vogue. Extensively as photography is now being utilised for Christmas, New Year's, and birthday cards, it might be still further employed if photographers themselves made it more a speciality, instead of leaving the whole of the business in that direction in the hands of the wholesale stationers, who supply only well hackneyed subjects, and often of little interest.

IMPROVING FEEBLE NEGATIVES.

IT not unfrequently happens that in consequence of error in exposure or injudicious development we find after fixing a negative that it is too thin to give a satisfactory print, though the gradations of light and shade are tolerably correct. In such cases, if the shadows are perfectly clear, it may be an easy matter to give the additional force by means of one or other of the numerous methods of intensification in general vogue; but too often that is the one condition that does not prevail, and to intensify by chemical means is the opposite of beneficial. Perchance the subject may be one of some little value, and the slightest suspicion of uncertainty as to the probable result suffices to deter us from any attempt in that direction. Under such circumstances, I have often found it useful to resort to the beautiful but little practised "dusting on" process.

This offers many advantages for the purpose, not the least being that it leaves the original image quite intact, so that if the first operation prove unsatisfactory we are at least no worse off than before,

and by cleaning off the first failure we may start afresh with the added knowledge of the particular requirements of the case gained in the unsuccessful experiment. The process, too, is a direct one, the auxiliary negative image being formed in a single operation without the intermediary of a positive or any reversing operation. In addition, great scope is afforded for local treatment, any portions of the image that may be already sufficiently dense being easily left out of the general treatment, and so the method becomes specially valuable for that class of subjects which are most difficult to deal with in the ordinary manner, where wide contrasts of lighting are presented to the camera.

Most of my readers are, I dare say, familiar with the general principles of the process, though, perhaps, not acquainted with its practical working, and to such it will be sufficient to give a few hints that may be useful in applying the method to this particular use. For the benefit of those who are entirely ignorant on the subject I may briefly recapitulate the details of procedure.

In the first place, a sheet of perfectly clean glass—in this case the back of the negative—is coated with a mixture of gum, gelatine, albumen, or similar substance, with a certain proportion of hygroscopic matter and a bichromate. This coating is thoroughly dried in the dark by heat, and then forms a hard, varnish like surface, which, however, rapidly absorbs moisture from the atmosphere, and becomes "tacky" as the plate cools, in which condition any fine powder dusted over the surface becomes adherent. It possesses the property, upon exposure to light, of losing its attraction for moisture, hence, when exposed under a negative to sun or diffused light, the clear shadows of the negative permitting the light to pass through, the corresponding portions of the sensitive film are hardened, and lose their power of attaching the powder subsequently dusted on, the parts protected by the negative image at the same time retaining the tendency to absorption. In this manner an image is formed by the fine powdery matter adhering to the protected parts of the plate—the parts which are unacted on by light—and so a negative image is formed *from a negative*. Such briefly is the principle of the process, the details of which I will attempt to explain.

Several formulae for the sensitive solution will be found at the latter end of the ALMANAC, but for this particular purpose I prefer a slight modification of that marked No. 1, as it gives a clearer film and one which is more under control in development than some of the others. To save the trouble of reference I repeat the formula here, as I have modified it; the solution is practically the same in the end, but I prefer to use a definite quantity of bichromate rather than so much "saturated solution." Take—

Bichromate of ammonium	150 grains.
Honey.....	180 "
Albumen.....	180 "
Water	4½ fluid ounces.

Dissolve the bichromate and the honey in the water, warm, and allow the solution to cool; then stir in the albumen until thoroughly mixed, but do not beat it, and when quite dissolved filter very carefully, repeating the operation two or three times if needful. Great importance attaches to the filtration, as upon the care with which that is done depends the beauty of the final result, the slightest speck of dust or floating matter giving rise to ugly blemishes on the film. This solution will keep good for some days in the dark. In very dry weather the proportion of honey may be increased and *vice versa*, of which more anon.

And now to apply it to the plate. Naturally, as we are dealing with a plate of glass already carrying a negative film, the operation is one that requires more care than if the reverse side of the glass were free. The back of the negative, it must be understood, is to be coated, and the first point requiring care is that none of the solution shall get on to the front. This, however, is easily managed in careful hands. At one time I preferred to varnish the negative before coating the back, but I have come to the conclusion that it is, all things considered, safer to leave it unvarnished. Cleaning the back of the plate has to be seen to however before coating, and this must be done very thoroughly; all mechanical impurities, splashes, and smears of emulsion must be first very carefully removed, though this should be done before the negative is dried. Then the glass should be rubbed over with a mixture of alcohol and ammonia in equal parts, and finally polished with a clean silk handkerchief.

Next, we come to the arrangements for heating the negative, which is absolutely necessary in coating and drying. Clearly it would be unsafe to heat the plate over a naked flame, which would be nearly certain to smoke or otherwise injure the gelatine film, so we must provide a "hot plate." This is easily arranged by placing the lid of a large biscuit or other tin box at some distance above a spirit lamp or gas stove so as to equalise the temperature as much as possible. Then, by means of wedges, or in any more convenient manner, it must be arranged that the negative may be suspended in a perfectly level position at a slight distance, say, a quarter of an inch above the hot plate, so as to catch as much heat as possible without actually touching the metal. This done, we are ready for coating.

The plate must first be very carefully dusted. It is best, after polishing, to set the glass aside for some time until all electrical disturbance has subsided, and then to remove any adherent particles with a single stroke of a folded silk or cotton handkerchief, then, immediately before coating, to sweep the surface once more with a broad camel-hair brush. Next, taking the plate by one corner with the thumb and finger, pour on to the centre a pool of the sensitive mixture. It is nearly hopeless to expect it to flow "like collodion"—any attempt at that will almost certainly end fatally for the negative, for some of the solution is sure to find its way on to the front. The best way is, after deliberately setting down the bottle, to lead the solution up to the edges with the finger—which must be quite clean—and when that is done to pour off the surplus by one corner into another bottle, leaving only a very thin layer upon the glass.

Now, perhaps, the troubles will begin, especially if the glass be not really clean. The bichromated mixture will very likely show a tendency to run away from the glass in patches, especially near the edges. If this be the case a little coaxing with the finger, gently *rubbing* the solution into the bare patches, will often cure the evil; if not, there is nothing for it but to clean the plate and start afresh. When the sensitive solution is in proper condition the only cause of this can be imperfectly cleaned glass. Should it, however, prove obstinate and refractory, other measures will have to be taken, and nothing answers better in my hands than a substratum or preliminary moistening with a feebly alkaline saccharine solution. Sixty grains of loaf sugar and ten drops of ammonia dissolved in an ounce of water and well filtered, is rubbed evenly over the plate with a piece of old linen immediately before coating; the solution will then usually flow evenly without the assistance of the finger.

The glass, being evenly coated, is laid down upon the hot plate in as nearly a level position as may be, and there left until quite dry, in which state it will present an even, smooth, and glossy appearance. Too great heat must not be applied, or decomposition will be set up and the film ruined. A temperature of 150° Fahr. is as high as it is safe to go. When dry the plate is ready for exposure and must be exposed at once.

I may as well remark that these plates cannot be prepared and stored, but must be made just when required for use, since the moment they cool down to the natural temperature they commence to become tacky. On this account every precaution must be taken to avoid damp during the period of exposure. In the case of printing from another negative, both negative and plate must be placed in the printing frame *warm*; but in our case the negative—picture side downwards—is placed in a printing frame, and backed with a piece of black velvet or smooth cloth previously thoroughly dried and still hot, and the back of the frame immediately closed. The backing of cloth not only serves to lengthen the time the film may remain without becoming tacky, but it also prevents extraneous light getting to the film.

The time of exposure will vary very greatly according to circumstances of light as well as density of negative. With a thin negative, such as we are likely to have to deal with, an exposure of twenty or thirty seconds will suffice in full sunlight; but I much prefer to use diffused light, which gives far greater control. From three to five minutes ought to suffice at this time of year, and even in the depth of winter and in very damp weather the exposure will not be long enough to render the film adhesive if properly dried and backed at first as I have described. The question of correct exposure is of some importance, since, if it be too long, the powder refuses to adhere except in the very slightest degree, and no density can be obtained. On the other hand, if the time be too short, and especially in wet weather,

or when the atmosphere is heavily charged with moisture, the film absorbs the damp so greedily that the powder, unless great care and judgment are used, is laid on in heavy "dabs" wherever the brush touches. On the whole, however, I prefer to err on the side of under doing the exposure than the reverse, especially where local treatment is necessary, as by constantly rewarmed the plate its tackiness can be very well held in check.

As regards the colour to be used, I do not think I have yet tried anything that is superior to the finely-powdered plumbago formerly used for making reproduced negatives. Its soapy nature renders it particularly suitable, and its fineness removes a tendency exhibited by many other powders to "pile up" in thick, coarse layers in the heavier shadows. I have tried, amongst other pigments, finely-powdered lampblack, but, irrespective of its greater cost, except for *over* exposed films it is inferior to plumbago. That I employ is the powdered plumbago of the oilshops sifted through muslin. A better preparation, and one requiring no sifting, is that used by electrotypers, and it is not expensive.

I find I shall have to leave the development for another paper.

H. Y. E. COLESWORTH.

ON THINGS IN GENERAL.

A CORRESPONDENT writing over the signature "A Painter" has the audacity first to hint, and afterwards boldly to assert, that "a portrait painter cannot receive any assistance by aid of photography." The thing is too ludicrous to use strong language over, but the statement appears to me about as conspicuously inexact as any ever launched upon the sea of controversy. It is, perhaps, sufficient that the Editors have said in a footnote to the letter that they know innumerable instances to the contrary. Take alone the number of posthumous paintings whose only claim to resemble the original is the likeness to a photograph taken before the subject died. Such portraits have been painted by the foremost painters of the day. But, lest "A Painter" should say that this is an evasion, I think I might point to the experience of almost every leading photographer of the day, who must have had portraits utilised for this purpose, if he have not, indeed, photographed sitters expressly for the use of the painters. I have a most distinct recollection of taking a gentleman's picture solely as an aid to the artist, who was painting a most costly presentation portrait of a public character, and I have myself supplied copies of portraits of my own taking to other artists for use in painting portraits. One gets used to the formula, "Just for a memorandum, you know:" but when the memorandum appears very plainly limned out upon the canvas one holds one's own opinion on the point.

There is, however, another, and I may say, distinctly, fraudulent, aspect that this subject sometimes presents, and which I cannot better describe than by narrating an instance that came within my own personal knowledge.

A well-known local magistrate in a town where I was once staying—it is now many years ago—invited me to see his art treasures, among them being two three-quarter length oil-paintings of himself and his wife. He had only given eighty guineas each for them, so that too much was not to be expected: they were, nevertheless, painted by an artist of repute. I quickly formed a very strong opinion about them, and was turning away from their neighbourhood when I was closely pressed for a criticism upon their merits. "My opinion, then, is that the heads are painted upon photographs pasted, or otherwise secured, upon the canvas." The worthy magistrate was indignant, and would not credit this for a moment. Years afterwards I was again in the same house, and I made a casual inquiry about the paintings. "Oh, the faces went all black, and the paintings are put into the lumber room." My original opinion was clearly a correct one, and the artist who perpetrated such a fraud was quite as worthy of punishment as Belt, the sculptor, who got eighteen months for misrepresentation when it was a matter of jewellery.

Talking of paint brings me to the suggestion for a backing material by a correspondent signing himself "H. Sedgfield," who recommends for a plate backing the contents of a tube of Newman's moist colour, purchasable, I suppose, at a shilling a tube. I am sure it would be a most useful material for the purpose, particularly so when the photographer had first gone out to make a sketch of his subject in

order to know where to smear the paint. I was always under the impression that the moist water colours were made with gum, water, glycerine, and pigment, so that the chief advantage of Mr. Sedgfield's method would be the giving of a shilling an ounce, say, for what could be easily made at fourpence a pound. As to smearing the fingers, why every one knows that the finer the state of comminution of the pigment particles, as would naturally be the case in prepared water colours, the more readily they will mess the fingers and the greater the difficulty of removing the smear. But perhaps it is a joke.

It needs a sufficiency of courage for even an experienced man who is *au fait* with his subject to start running a-tilt at a variety of objects which, though generally accepted as genuine, he considers to be impositions. He risks a fall at the outset; but when one most imperfectly equipped in the matter of knowledge of his subject starts on such a course, he is bound to fall ignominiously. Such has been the fate of a gentleman of Philadelphia, whose long article read at the Philadelphia Society, on *Some Photographic Heresies*, was recently given in the pages of this JOURNAL. Most of the attacks he makes serve but to show his want of acquaintance with his subject. With his countryman Mr. Carey Lea's recent investigations close under his nose, as one may say, he can actually speak of the best photographic writers being proverbially but indifferent photographers. Wet collodion, according to this gentleman, is to bury itself. What will the enlargers alone say to his proposition? When he gets on to the subject of dry plates he gets hopelessly adrift. He supposes photographers generally to be afraid of rapid plates, and that sparkle and latitude have to be sacrificed to rapidity; and finally says, "I hold that a good rapid plate is capable of doing all that a slow plate is, and much more besides." This is all sheer nonsense. A good photographer uses rapid plates whenever he wants great rapidity, and he knows it to be a fact that, at any rate with the majority of good plates purchasable, there is a vast difference in the working of quick and slow, and that these quick plates will not do all that slow plates will by a very long way. "Development is not the simple matter some people would have us believe." Who that knows how to develop considers it a "simple matter?" Mr. Truscott, not content with showing the capabilities of a south light in a studio, prefers it to a north. Again, he appears to think that Professor Burton is the first to discover the inaccuracy of the expression, "depth of focus;" and, of all absurd things in the world that he could do, Mr. T. falls foul of Mr. J. Traill Taylor in a question of photographic optics! I never met with such a tissue of erroneous notions and incongruities as this paper presents.

The new Antwerp Section of the Belgian Photographic Association rendered its initial meeting celebrated by the description of a method of preventing prints from cockling while drying. The plan soberly recommended was to steep them in a mixture of glycerine and water (nearly one half glycerine), and allow to dry. I wonder if the writer ever tried treacle, and I should expect, the next time he contributes, to hear of his having recommended birdlime as a mountant.

On the same page of our JOURNAL that I read this remarkable recommendation I observed that a sum of thirty-five thousand florins had been voted by the Municipal Council of Vienna as a subsidy towards a Photographic Institute. It would be a long time before such a subsidy were given in this country. There are always two sides to a question, and this suggests a sort of endowment of research the very mention of which sends off some people into a state bordering on frenzy. There are few who would doubt, however, that such a sum set apart in this country for a similar purpose would be capable of most valuable service. We have not to look far back to see what has become of those who have borne the heat and burden of the day in photographic discovery while their followers have reaped an easy harvest. I would not suggest an eleemosynary disposition of any such sum, but merely a slight smoothing of the thorny path of discovery by those earnest workers whose means do not enable them to follow the bent of their inventive skill.

FREE LANCE.

ECHOES FROM THE SOCIETIES.

I HAVE long been a staunch advocate of "slow development" for all ordinary purposes, that is except where the particular circumstances distinctly counter-indicate its advisability. By "slow development"

I mean careful, and what has been termed "tentative," treatment, as distinguished from piling on the full force of the developer at the outset and finishing the operation in a minute or two. I am fully conscious of the value of time, and should decidedly lay myself out to save it as far as possible, if I thought I could produce as uniformly good results time after time in two minutes as in five; but I am afraid that until correct exposure becomes a purely mechanical matter that is impossible. No harm is done to a slightly underexposed plate if the tentative system be followed, since the lack of exposure can be recognised at a very early stage of the proceedings, and the treatment modified accordingly. Similarly with over exposure. In fact, I may say that I, as a rule, follow the practice of Mr. H. J. Newton, though I do not call it, as he does, "always over exposing." It would be over exposure if I always followed it with high pressure development.

But when the high pressure system is adopted the giving of a "full exposure" becomes a risky, if not an impossible, practice, for one of two things must happen—either an unnecessary strain is thrown upon the operator during development or his results must suffer. The high pressure system of development is, to my mind, "taking hold of the wrong end of the stick." There is latitude both in exposure and development, but far more in the latter. Why, then, compel greater care and exactitude in exposure by working the elastic operation of development in a rigid and inflexible manner?

But with all my love for slow development, I think Mr. A. W. Beer sails beyond the bounds in his paper read before the Liverpool Amateur Photographic Association, in which he recommends the "American Standard" developer (has this anything to do with the "Stars and Stripes," it seems to have nearly as many ingredients) at *one-eighth* its normal strength. The probable result is well foreshadowed in his statement that "if no development appears in five minutes" he proceeds to strengthen it, and after waiting another similar period, if matters do not improve sufficiently he repeats the operation. I think things might easily proceed "quietly and sedately" without occupying that time; but if Mr. Beer is of a different opinion, I am afraid I for one could not agree to follow his advice—"Don't hurry."

Mr. Beer expressed himself to the effect, also, that pyro in solution is "uncertain," and that "dry pyro goes further in development than pyro in solution." This is distinctly contrary to my own experience. I have used pyro that has been in solution for upwards of twelve months that has, when tried against freshly dissolved, proved every whit as vigorous in its action. I have used dry pyro in the haphazard manner that used to prevail of shaking or ladling out of the bottle what was *estimated* to be the required quantity, and have been surprised to find what a hole a dozen plates make in an ounce under that system. I do *not* find that dry pyro goes further.

Speaking of estimating the quantity of pyro, I heard a good story some years ago of a then shining light in dry-plate photography, who attached great importance to the strength of the pyro in development, and advocated, with certain plates, only a grain and a half to the ounce, a quantity which, with those plates, others failed in getting density. He was tackled on the subject, and proceeded to demonstrate. One plate was developed successfully, but not to the immediate discomfiture of his opponents. A second trial was proposed, and when his *estimated* "three grains" was shaken out of the bottle it was seized and weighed. It only weighed thirteen!

By the way, what constitutes the "American Standard" developer, and who appointed it "standard?" Including Mr. Beer's repetition of the formula, and another English "translation" of it, I have quite recently come across four versions of it, all, I think, different. Certainly two versions, published by two different *American* societies, looked very much like two distinct standards.

The stale old outdoor meeting joke of "developing a goodly number of plates (of ham and eggs)" cropped up again the other day for the enlightenment of the members of the Derby Society. The original perpetrator might have been excused, not only on the ground of novelty but also of greater logical exactitude. His joke was about *cleaning* plates. But the modern plagiarist's intellect does not rise to correctness even. Development is a constructive operation; the manipulation of a plate of ham and eggs decidedly destructive, so far as what is on the plate goes.

Mr. W. T. Wilkinson's application of the "air brush" (how I dislike that name! so suggestive of a Cockney's way of speaking of a different implement) to photo-engraving is ingenious, and, I should think, would prove effective, giving, in skilful hands, a superior grain, because selective, to that employed in the Klic process. As described to the members of the London and Provincial Association, his method consists in distributing over the plate to be engraved a fine spray of solution of bitumen so as to form a delicate grain. As the legitimate use of the air brush is for the shading of pictures in monochrome, it is easy to imagine that it will serve its new purpose well, and be capable of producing a variety of "grains" to suit different subjects. The plate is afterwards etched through a carbon print developed on the plate over its artificial grain.

This reminds me of a similar application of a ruder instrument I saw some dozen or more years ago. A young artist, a friend of mine, who did a good deal of work in drawing portraits on the litho stone, was at the time I speak of making his first experiments in etching on zinc as a substitute for the stone, and what chiefly bothered him was getting a satisfactory grain. He had tried a variety of plans he had heard or read of, but none satisfied him. One day, as I stood watching him at work, and listened to his growls about the grain, I suggested, "Why not shade the zinc as you do the stone?" "By Jove!" he said, "the very thing." His method of shading was to charge a tooth brush with thin litho ink and with the finger to "spirt" it on to the stone in the same manner that "falling snow" is put into negatives by artful photographers. My friend may still use the same process, for he has been engaged on "process" work for many years now.

Mr. Cowan's method of producing a chemically clean surface upon glass communicated to the same meeting is worth knowing, and though not perhaps of very wide utility, may be found invaluable on special occasions. For instance, in silvering reflectors or small mirrors the difficulty usually is to get a perfectly clean surface, and this plan appears to fill the want. It consists in coating the glass after ordinary cleaning with a solution of gutta-percha, which, when dry, is stripped off the plate, leaving an absolutely clean surface.

From what I can gather from the discussion that followed the reading of Mr. Octavius Smith's paper, *On Systems of Numbering Photographic Lenses and Diaphragms* at the North London Society, that gentleman took the trouble to go with unnecessary accuracy into figures and details that were of no real practical value. Mr. George Smith (there seems to be an epidemic of Smiths amongst lenses and diaphragms) got up and corrected the other Mr. Smith on one or two points, and advocated practical in preference to mathematical accuracy. There was a sly sarcasm in Mr. Mackie's allusion to the manner in which the other Mr. Smith had "endeavoured" to be "extremely accurate" in placing himself in a mathematical position to be able to guess at the rapidity of his plate and the value of the light. But Mr. F. W. Hart pleased me most in his remarks. In his early days at photography—the early days of photography, in fact—there was no trouble about exposure tables and diaphragm numbers; they trusted to experience, *i.e.*, common sense. "It was only within the last few years that photographers had commenced to worry themselves about such matters." And he finished by advising that to learn experience would serve the young photographer much better than all the "tables."

My own experience with tables and calculations is similar to Mr. Medland's; they are more bother than they are worth, and utterly misleading if implicitly trusted to. As for "Mr. Medland's friend," who was stated by another member to produce "excellent work with the aid of exposure tables," I should be inclined to say he did it with the aid of experience, and *in spite of* the tables.

I once had, on a photographic trip, to share a double-bedded room with a travelling companion, one of the mathematical-before-photographic class. He had been at work all day with his tables, and had littered the landscape with the crumpled papers on which he had performed his calculations, even "composing" his pictures with a funny looking instrument of his own invention. After we got into bed he went into the theory of things in general, and by about daylight seemed to be making things clear to himself, when I dozed off and dreamt that I was the late Mr. Babbage's calculating machine, and not

COLOURING AS APPLIED TO PHOTOGRAPHY.*

As laid down, all colours *complementary* to each other are greatly enhanced in value and effect by their being judiciously placed in juxtaposition one with the other. Indeed, the general harmony of a picture may be said to altogether depend upon this principle being strictly adhered to. Colours, however, which are *not* complementary to each other when so placed will mutually injure each other's natural beauty. For example, a blue and a purple placed in close proximity will be mutually injured, and this for reasons very easy to discover—the natural purity of each tint being marred by its companion. The blue will be found to assume a somewhat greenish tint, resulting from the yellow rays emitted by the purple, and the purple in turn assuming somewhat of a russet tinge on account of the orange rays given out by the blue.

In the case of *neutral tints* being placed in contact with full hues or tints, these same neutral tints should incline to the complementary of such hues or tints, as the best and most harmonious effects can only be produced by so doing. Thus, when an olive tint is placed in contact with a yellow, it should, in order to produce the best effect, incline to purple rather than to green, the former being the complementary of yellow.

In this regard, the contrast of hue or tint is not the only point to be considered. There is also the contrast of intensity, and much effect at times may be gained by its skilful treatment. It will be easily observed that when two tints of the same colour, but of widely different degrees of intensity, are placed together, the deep tint will appear to deepen still more in tone, while the light tint will seem to become still lighter, the difference in intensity being most observable at the points of contact. This principle will hold good in contrasting colours of varying degrees of intensity, inasmuch as they will be found to receive a double modification by being brought into contact—the brilliancy of hue as before stated as well as the intensity—the deepest colour seeming to be still deeper, while the least intense will appear to become more washy.

All colours when brought in contact with pure white gain depth, for the simple reason that the white assumes the complementary tint of the colour near it. On the other hand, black has the effect of weakening the colours placed in contact with it, or even in its immediate neighbourhood. There is a wide difference, however, produced by the various hues coming in contact with or on black, the depth of black being very greatly influenced and materially modified by contact with such colours as have a luminous complementary. Thus, when purple comes in contact with black, the latter loses its depth and brilliancy considerably, owing to the tinge imparted to it by the yellow rays emitted by the purple; should it come in contact with blue or green, it will partake of a rusty tone, caused by the orange or red rays thrown out by these colours. On the other hand, black, when coming in contact with red, yellow, or orange, becomes more intensified. All pure colours will be found to gain brilliancy by the juxtaposition of grey, which may be considered a mixture of black and white.

The harmony produced by the skilful placing in juxtaposition of such colours as mutually benefit each other, and the harmony produced by judicious contrast, are not the only harmonies we have to consider. We have still what may be called the harmony of analogy. This latter is to be obtained by a combination of the various gradations of any one colour in its own scale, or of the hues and tints in the order in which we may observe them in the solar spectrum.

By the judicious arrangement of analogous tints in their most favourable and harmonious relations and almost endless variety, the most pleasing results may be secured. In this treatment, however, there are more difficulties to combat with than either of the other two. The effects are less striking—more delicate, as it were—and requires a greater amount of real artistic feeling and keen perception, combined with more skilful management, to produce really happy and successful effects.

The laws which regulate harmonious colouring are *not* the outcome of an over-excited fancy, or even the result of some extremely sensitive organization, which, being endowed with a keen appreciation of the beautiful, has laid these rules down to be followed by less gifted followers. On the contrary, this harmony is inherent in nature, and

* Continued from page 518.

it is nature herself which lays down these laws for our guidance when we would seek to reproduce her. It will require but a small amount of study or observation of nature to discover ample and pleasing illustrations of the various kinds of harmony. What a striking illustration of the harmony of analogy does the rainbow afford us, with all its beautifully blended and delicately graduated colours! If by any chance this most wonderful study of colour should not have received ample attention from any reader, let me suggest that the next opportunity be taken advantage of. I cannot think of any combination so complete and so thoroughly showing the balance as well as the harmonies of the various colours.

All the principles to be learned from such observations are of the greatest value to the art student, and should never be neglected, whether his intention is to follow landscape painting or portraiture. Although of greater value, perhaps, in the former branch of art, it will be found to be of very considerable help in the latter, and in all cases will exalt the artistic feeling of the student.

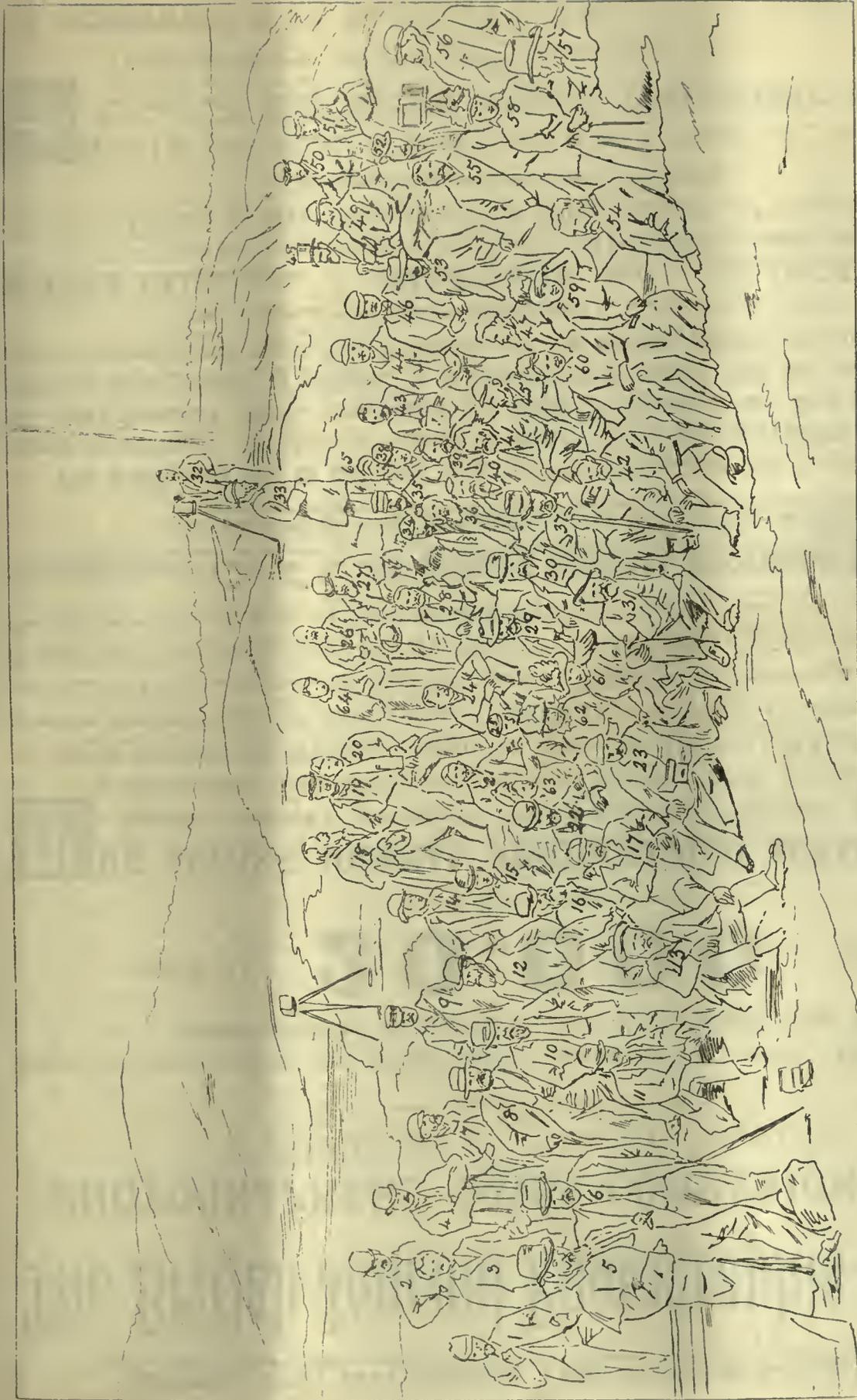
What a lesson is to be gained from the careful contemplation of almost any landscape. There we may observe the blue of the extreme distance blending with the cool greens and greys of the middle distance; then these in turn seem to melt into the warmer and more positive greens, yellows, and browns of the foreground. If on such a landscape we have the advantage of a setting sun, how completely changed, and still more beautiful, is the effect. There is a warm glow thrown over the whole scene; every object seems to be beautified as it were by a golden light and a purple shadow. Nature will afford the willing and observant student endless varieties of effects to study from. In nature harmonies of contrast are not hard to find, they are visible at every step; from the wild moor to the fertile valley everything suggests beauty and harmony. The ever varying of yellow gorse mingling with the purple heather, the scarlet holly berry and its deep (and complementary) green foliage, the rose of whatever hue and its green leaf in harmonising contrast.

The wildest dreams of an artist will never suggest anything like the incredible freaks of nature as regards drawing as well as colouring. Gustave Doré produced some very extraordinary effects in the way of clouds—studies which really appeared absurd on account of their seeming extravagance, and to tell the truth I myself thought them *impossible*. But on examination I felt assured that they were the products not of a wild and fertile brain but of a close study of nature. The autumn of the year I saw them I saw almost every evening the most extraordinary forms and combinations of clouds I ever saw in my life. In fact I never saw anything like them since. They were to be seen from Piccadilly looking over the Green Park. Once going by boat, too, from Dublin to Holyhead I had a look at the Welsh mountains in the early morning. I never saw such colouring, and I am sure if transferred to canvas few would be found to believe it real and as in nature. It is many years now since this occurred, but it so fixed itself in my mind I have never forgotten it.

From all this the grand inference to be drawn is—study—study nature, for she is the only fountain of real knowledge. The principles laid down here are only those dictated by nature. They should be properly understood by all as they will enable the colourist, while preserving truthfulness to nature in such points and details as are absolutely inherent in the *original*, to surmount the difficulties that may crop up in the management of the draperies, accessories, background, &c., thus giving due value to the complexion, and producing not only a pleasing, but a perfect and harmonious picture.

There is much of all this which may not appear necessary, strictly, to "colour as applied to photography," inasmuch as colouring is mostly employed for portraiture in this line. But think what advantage it will give one in the treatment of a picture to have a thorough knowledge of the art generally to support you. How much more easily will you gain your effects, and how much more harmonious and artistic will be your picture when finished. How often can an ungainly figure be made presentable by the artistic treatment of the surroundings.

Another advantage that may be gained by a thorough knowledge of the principles of colouring is breadth. An experience I had a few years ago will, I think, explain this view satisfactorily. I had an order for two portraits, which had to be finished by a certain date; I could not possibly get them done myself so I was obliged to give



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them to a friend. He made a great success with them, *although he never saw the originals*. I had not three hours work to finish them, although this may seem impossible to many. (Please note, however, they would not be mistaken for the work of Sir Thomas Lawrence or Sir Joshua Reynolds.) However, to get back to the pictures. By some strange accident he painted the backgrounds differently, so differently, indeed, that the pictures did not look the same size. In fact, you could measure the canvas and then go back, and you would still hold that they were not the same size. One treatment dwarfed the canvas, while the other gave the feeling of breadth. When I drew his attention to it, he altered the defective one and made a most successful pair of portraits. It was a pure oversight that let him make such a mistake.

This will show, however, that an artist who so well understands the principles of his art can produce on a certain size canvas an effect that will make it appear double the size and give it general importance. In art we need never be afraid of knowing too much, but rather always try to learn. I have had a fairly long experience in some ways, yet every day I try to learn, and I often find some strange experience crop up to repay me for my watchfulness and disposition to still learn.

REDMOND BARRETT.

(To be continued.)

METROPOLITAN INDUSTRIES.

THE GOLD AND SILVER WORKS OF R. PRINGLE & CO., AND THE REDUCTION OF PHOTOGRAPHERS' WASTES.

FROM the fact of so little being said at our various photographic societies concerning the economies of the art so far as regards the utilisation of wastes, one is tempted to ask, Are photographers really aware what an enormous saving of the noble metals—silver in particular—may be effected by the extremely simple system of preserving their wastes, and sending them to the refiner or reducer, and having them converted into current coin? We know of one photographer who makes somewhat of a hobby of reducing his wastes himself, and who thinks he does his work ineffectively when he fails to recover seventy per cent. of the silver employed in sensitising his paper.

We once arrested the hand of an amateur who was just about to empty down the sink the contents of a large dish of hyposulphite of soda in which he had been fixing 15×12 negatives until, as he said, it had become so saturated that it had lost its power for fixing any more. It was, instead of being allowed to run to waste, transferred to a glass vessel, and a lump of potassium sulphide (liver of sulphur), previously dissolved in water, was poured in. This act was attended by the production of a copious black precipitate, representing the whole of the silver that had been in all the plates fixed in that bath, except so much as had been reduced by the developer and gone to form the image—a somewhat small proportion. Now we are not here going to give a dissertation on reducing wastes, but we may say that the precipitate referred to could either be converted into nitrate of silver, melted into a nugget of the pure metal, or, easier still, be sent to the refiner, who would return its value in cash to the sender or charge him a small sum for reducing and melting it down in a bar.

All this is by way of preface to a brief account we purpose giving of a visit we paid to one of our metropolitan silver and gold refineries—that of Messrs. R. Pringle & Co., Clerkenwell-road, better known years ago as the famous Wilderness-row of the jewellery and watch-making district of London. Indeed, Mr. Pringle still keeps up the old associations connected with that once well-known name by designating his factory the "Wilderness Works."

After entering, and passing by the jewellery sale department as possessing no interest in our present quest, we descended into the basement storey, which extends out behind, and where the refining is carried on. In one place we saw a huge stamper—a species of steam hammer—alternately raised by steam and falling by its own gravity in a mortar, where it was engaged in crushing to a fine powder crucibles and skittle pots, which, having done their duty in melting the noble metals, were being prepared for a further yielding up of every atom of these metals which had remained attached by adhesion or permeation.

In another place we saw a boy subjecting to a searching examina-

tion the sweepings of some jewellers' floors or benches, opening every scrap of paper carefully, for who knows that lurking therein may be some diamond, ruby, or gold ring which might have been lost, and which would be destroyed in the crucibles to which a transference was so soon to be effected.

Photographers' wastes were there in various forms, much of it in the shape of ashes, implying a previous state of existence in the form of paper or cloths. When a parcel of waste is received from a photographer it is reduced to a homogeneous mass, and a definite and carefully weighed portion placed along with a flux in one of a series of tiny crucibles kept for the purpose, and through the agency of furnaces, each capable of holding several of these, a bead of metal is obtained which, when placed in the assay balance, enables the assayer to determine with a singular degree of accuracy the value of the whole.

The reduction of the wastes is effected by a series of large crucibles in furnaces at the end of the building. Of course it must not be imagined that photographic wastes alone supply these furnaces and refineries with work, for although it has a somewhat unpretending exterior, yet is the interior a hive of industry, embracing everything connected with the metallurgy and working of the gold and silver trade, established over fifty years ago, and now employing altogether about seventy hands. During our brief visit we witnessed the melting of metals and their being cast into ingots, rolled into sheets, and drawn into wires.

It may be mentioned that two members of the firm are amateur photographers, therefore they have the advantage of knowing exactly what the requirements of the photographic profession are.

The preparation of nitrate of silver and chloride of gold, goldsmiths' and silversmiths' work, mounting, polishing, electroplating, and gilding, is also extensively carried on, altogether consuming large quantities of gold and silver, so that Messrs. Pringle are only too glad to allow the utmost value for the precious metals in order to keep up their own supply.

PHOTOGRAPHY IN COLOURS.

ONE of the first communications I ever addressed to any journal was on *Photography in Colours*. It is dated "London, May 19th, 1865," and appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY on the 26th of the month which I have named. I was at that time in the employment of Mr. J. R. Johnson, of the "Pantaseopic Company," and at their establishment, No. 3, Red Lion-square, W.C., my duties were those of an operator, chemist, and so forth. My various predecessors, when their silver baths went wrong (a very common thing in 1865), were in the habit of bottling them up, labelling them "old bath," and proceeding to make a new one. I accordingly inherited several gallons of "old bath," which Mr. Johnson required me as a chemist to reduce to a working state. I accordingly mixed the lot together, sunned them, and evaporated down to crystals. Some of the baths, I was informed, contained acetate of soda, some citrate, and sundry similar bodies added to gain intensity. However, the new bath mixture, duly filtered and acidified, worked extremely well, with this very startling peculiarity, that the photographs taken *were all in colours*—natural colours when seen by reflected light, their complementary ones when seen by light transmitted. The colours were not bright and vivid, but they were *there*, on every negative, and were not discovered until the fixing and washing had been done, nor, indeed, until some weeks after varnishing.

Red Lion-square, the subject of my negatives, which were taken for the verification of the Grubb's numbers of the aplanatic lenses which we used, is not—or at any rate was not—a place of lively colours. The red-brick houses had been rendered dark and dingy by the hand of Time; the green of the garden trees and grass was but "indifferent honest," and the blueness of a London sky was generally of a sombre hue.

Carefully inspecting one of a number of these negatives, I was struck first by the fact of its presenting, when viewed askew, a murky effect, as of a coal-tar stain floating on the inky waters of the Irwell (the river of my native city). There was a very dirty blueness spreading over half the negative. I next observed that this murky blueness was on the sky alone; then that the trees and grass were a dirty, murky green; then that the houses were a filthy brown. By transmitted light the filthy complements of the filthy colours were distinctly seen. The appearance was on all the negatives. I showed them to Mr. Johnson, and when told they were made with

the old baths revived, he ordered a careful analysis of the material of the baths; but I detected nothing definitely but silver, soda, potash, and nitric, acetic, and citric acids. The mixture previous to treatment smelt of aldehyde, and after crystallisation and re-solution of apples. What the substance is which smells like apples I don't pretend to know, but I remember a fellow-student in the laboratory of Owens College was once unfortunate enough to upset about fifty shillings' worth of bichloride of platinum which he had made upon the laboratory table where we worked. We mopped it up with filter paper, washed out the paper, and evaporated the solution down to dryness over a water bath, and that smelt like apples, too. New baths were made, and citrates, acetates, and formates added, but no filthy colours were obtained. The results were merely normal, but with a rich peculiar bloom. One of these negatives, with Mr. Johnson's sanction, I retained, and it is possible I may find it yet, though quite twenty years have elapsed since I saw it last. These pictures were photographs in colours, feeble and smudged almost out of sight by the overwhelming preponderance of the ordinary negative deposit.

I can give no further particulars of their production than that Mr. Johnson's dark room was dark indeed. It was a photographic tent with ruby glass about nine inches square, and a yellow textile flap besides. It was, further, situated far from the window of the room, and so dark that it was barely within the reach of possibility to see what you were doing. It was the production of these negatives which led me to give consideration to the subject of "photography in colours," and to write the letter which appeared in your issue of May 26, 1865. That letter is concluded by the paragraph:—

"However, I quite believe, from such evidences as have fallen in my way" (alluding to those described above), "that by carefully, patiently, and perseveringly pursuing a systematic course of experiments, recording and remembering their results, we shall at length be enabled to solve the beautiful but difficult problem of *Photography in Colours*."

In the body of my letter (that of 1865) I say:—

"If we could prepare a plate which would be acted upon by rays of all colours . . . it is perfectly obvious that it must be prepared and retained in absolute, and not relative, darkness before it receives the intended exposure, unless the process is to be an extremely slow one."

Again, I say:—

"We must either discover a means of destroying the sensitiveness of the film, without destroying the latent image or our capability of developing it, or else the latter process must be conducted in absolute darkness also.

"By what means sensitiveness of the film might be destroyed before development," I continue, "is really far beyond me to suggest. To develop in absolute darkness (if we would have other than random successes) we must evidently have some means of knowing when to stop apart from the use of our eyes. These means, beyond doubt, will consist in having such a knowledge of our plate and its properties, the amount of light, and the action of our subsequent chemical reagents, as will enable us to perform all our operations to time. To ascertain the exact properties of our sensitised plate would require careful experiments to be conducted, with a prior and thorough knowledge of the composition, &c., of our chemicals, and with the aid of a variety of instruments, amongst which there would certainly be a thermometer, probably a barometer and a hygroscope, and possibly an electrometer and a host of others. To ascertain the amount of light . . . we certainly require photometrical apparatus, probably very different from any now in use; whilst to acquire a knowledge of the actions of our subsequent chemical reagents would require experiments carefully conducted with the combined knowledge of our plate and light."

So said I, and in these columns, two-and-twenty years ago, and with very little variation so say I now.

I do not now think the barometer, the hygroscope, or the electrometer would be required, whilst as to photometrical appliances I am of opinion that those produced since then by others and by myself would answer all the purposes required.

When staying in London in 1881 I spent a considerable portion of five weeks in the laboratory of Captain Abney at South Kensington, and was there shown some of his spectrum photographs in colours on silver plates. Probably I did not see the best examples. Those I did see, however, whilst they showed all the colours, did not (considering the character of the objects photographed) present much less of smudginess than my own of 1865. There was, however, this great difference—Captain Abney knows how his own were got sufficiently well to get them when he likes again, whilst my own results I am unable to reproduce at will.

I think, however, Mr. Carey Lea's researches are likely to set us on the track again, and I still am confident that "we shall at length be enabled to solve the beautiful but difficult problem of photography in colours,"

D. WINSTANLEY.

THE CAMERA IN THE FIELD.

THE tourist season has set in with its usual severity: moor and mountain, wood and stream, are being daily stormed by the silent artillery of the optician, and photographers in search of the picturesque are as common as shells on the seashore. The late descent upon Glasgow and the Clyde suggests some novel reflections. Some day, for instance, we may read that the "Saucy Susan," seventy cameras, was passed in such and such a latitude and longitude; or that Slocum-in-the-Slush is at present invested by the Hotchkissian battery of a hundred and forty cameras, mounting instantaneous shutters with a range of speed from a second to the ten thousandth part thereof. Parenthetically, another fantastic avenue of thought is opened up by the frequent spectacle of printing frames placed in the windows of private dwellings. The eligibility of a suburban villa must be appreciably enhanced if its front windows enjoy a moiety of sunshine, so that gentlemen's negatives may be printed before leaving for the City. No enterprising dealer has yet annexed the notion of retailing complete sets on the hire purchase system; but it is evident that before long certain dwelling houses will be mentally ticked by those who are amateur photographers and those who are not, according to their sympathies, just as now one remarks, responsive to his feelings towards that ill-used instrument, the presence or the absence of a pianoforte.

Those who are turning their backs upon the populous city pent are to be envied. In company with the grand old gardener and his wife in the great Miltonic epic, the world is all before them, and there is little doubt that full advantage is being taken of so wide a choice, and that when October comes round the operations of development and printing, for which the month of brown ale and nuts is noteworthy, will be the chief concerns of an expanding circle. It is in the field that the qualities of the modern landscape camera are put to the only satisfactory test, and that we find out the true value of paper theories and shop-counter nostrums. Students of these columns will not have failed to notice that whilst one authority recommends an instrument because it possesses all the "latest" improvements, another denounces it on account of its faddishness. In fact a bitter duel is in progress between the ideally perfect and the simple but practically efficacious. Of late there has been a strong tendency to supplement the chief functions of the landscape camera by a host of ingenious but superfluous movements. Now it is easy to go too far in the direction of florid "improvements" when devising a new camera, just as in architecture an otherwise beautiful façade may be marred by too much ornamentation. In this connection simplicity is almost synonymous with efficiency. The new race of patent cameras are certainly not simple, and many of their movements are—if a camera can be accused of any latent waggishness—absurdly funny; more, they are not only unnecessary, but they defeat their own object by taking longer to work than the very methods they are supposed to supplant, and, in the case of entirely new devices, are not wanted once in a blue moon. If a camera is made of well-seasoned wood, and by hand; light, without being flimsy; portable, at no sacrifice of freedom of play; with a rising, falling, and sliding front; a reversing holder; double swing; and a good length of focus, every possible requirement of all but the supreme virtuoso will have been provided for. These patent movements will not stand the very easy test of constant usage. For example, revolving backs are uncertain in their action, and their advantages are imaginary, for the reversible holder is simpler, more reliable, and often quite as quick in practice. Again, the turntable as an integral portion of the baseboard possibly saves a second or two, but I believe it to be an ultimate source of weakness to the camera, for whilst the time-honoured triangle causes no structural strain to the instrument it supports, in the case of the "feather weights" now in favour the diverging pressure of a powerful tripod must tell in the end. Despite the ingenuity of some of the recent improvements, I do not think they are destined to win much applause. At the present rate, the patent camera of ten years hence will be an awful thing to comprehend, especially to a novice. It is bad enough now, even if all the movements work as smoothly as it is claimed they do. The other day one of these clever concoctions was forwarded to its purchaser, who had to use brute force to get one of the patent movements to fulfil its task, whilst, horrible to tell, he had to open the dark slides with a chisel, for the clasps were hammered down quite a sixteenth into the wood. They manage these things better in the vicinity of Clerkenwell and Gray's Inn-road, where innovation is slow but successful.

I always follow the patent news week by week, as it is generally instructive, and sometimes amusing. For one thing, it fills me with astonishment at the tremendous fecundity of the photographic "inventor." I wonder how many times it stands recorded that So-and-so has applied for letters patent for improvements in instan-

taneous shutters; that Tom, Dick, or Harry, has made a similar request in connection with the camera; and that Mister Tout le Monde has humbly prayed for ditto ditto for a new tripod stand? This sort of thing has been going on for years with almost grotesque persistency, and yet to-day, if we could take a plebiscite, I believe we should find that the plain drop shutter with an elastic accelerator is the best for all-round use; that the camera I have sketched (which, minus the reversing holder, was known a decade since) is not likely to be displaced: and that the simple folding tripod, which is relatively as old as the hills, is almost as firm in popular favour. Our inventors should diffuse their energies. Why won't somebody give us a dark slide, [which, by ready adjustments, will carry plates of every size below its maximum capacity, and thus obviate the troublesome inner frame? I never look at one of these heavily patented cameras without thinking of the moral metaphor wherein figureth a camel and a gnat. What is the use of a hundred adjustments to the camera if the slides are not absolutely, unimpeachably light-tight? It will read strangely, no doubt, but actual experience proves that for every ten men who make a good camera not more than one turns out a reliable dark slide. So much for machine-made apparatus. As Thackeray's Jeames remarks, "Oh, trumpery! oh, Moses!"

Some people think that the size of the small numerals on their slides might be increased with good results. It was a practical man, and not, I should imagine, wholly unconnected with the tea trade, who had the numbers of his slides painted on them to the size and appearance of the fat figures one sees on the caddies in the grocers' shops. The resource of the young lady who went to Egypt with her camera was scarcely so happy. Having focussed her first picture to the requisite sharpness, she gave orders to have the screen, which was a moveable one, packed away, and instructions that the camera was not to be touched on any account. "For," to quote the fair innocent, "I've got a good focus, and I mean to keep to it." So she did; roaming Pharaoh-land, and exposing dozens of plates upon as many objects, near and far, big and little, with a light heart and a "good focus." And when she came home and had her plates developed, and scrutinised the results, she—well, she emulated the parrot of revered memory. A collection of all the photographic oddities one hears of would form a droll book. An absent-minded man "took up" with photography and on his first outing forgot to remove the cap; on the next, took it off before pulling out the shutter of the slide; on the next, solemnly exposed the plateless slide for five seconds with $\frac{1}{2}$; and ended by offering his kit for sale. He didn't find a purchaser, and after a time he began to wonder if the non-utilisation of his brains had anything to do with his failures. I don't know what conclusion he arrived at, but he is now, or was recently, passably proficient in the art he was once heard to stigmatise as too difficult for him.

MARSTON MOORR.

MAGNESIUM COMPOUNDS FOR FLASHING LIGHTS.

RECENTLY in a note appended to our reprint of a patent, it was pointed out that the use of a mixture of powdered magnesium, sulphur, and sulphide of antimony, to give flashing lights for photographic purposes, is a very old invention, seeing that it was prominently brought before the South London Photographic Society on November 9, 1865, by J. Traill Taylor, and formed the subject of an editorial article in THE BRITISH JOURNAL OF PHOTOGRAPHY in the following year. But its utility seems now to be on the point of being appreciated, for its merits are being fully investigated in Germany. It seems likely to have considerable commercial value in photographing sitters in their own homes; it may make this class of work common.

At one of the meetings of the Berlin Society for the Advancement of Photography, with Dr. Vogel, the President, in the chair, Herr Miethe gave particulars relating to some experiments he had made in company with Herr Gædicke concerning instantaneous photography by the magnesium light. The *Photographische Mittheilungen* states that he mentioned that they had worked for six months at the experiments in order to render the method of practical utility; they abandoned the use of magnesium riband and replaced it with the powdered metal mixed with salts rich in oxygen, but until recently they did not obtain satisfactory results in photographing moving objects. Herr Kuntze, who assisted them in their researches, said that the final results were surprising, and exhibited some pictures they had taken, including one of a dog, which proved the rapidity attained. Another print was from a negative of an old painting, and was a well-balanced monochromatic reproduction; in this case, salts which coloured flames red and yellow had been added to the powdered mixture. Herr Schultze-Hencke remarked that one of the portraits had been taken by daylight, and the part which was in shadow by the light of day alone, had become the brightest under the influence of the

magnesium light, consequently plenty of illumination was afforded by the method. The meeting considered the invention to be of high value.

Herr Gædicke then gave a practical demonstration, by taking the portrait of Herr Milster. The mixture was placed in a lantern with a glass face, that the smoke might not escape into the room. The shadow side of the sitter was illuminated by a reflector built up of tin plates, and too intense lighting of any part was avoided by the interposition of thin sheets of silk paper. To photograph a group, Herr Gædicke placed his mixture in a little iron cup, suspended by means of a cord before the luminous focus of a reflector made of leaves of paper. The lighting was graduated in the following manner:—Two or three thicknesses of silk paper were placed between the light and those nearest to it; the next part of the group had but one or two thicknesses of the paper interposed; upon the most distant part of the group the light fell direct.

The *Mittheilungen* then makes some statements which require additional verification. It says that the inflammable mixture has the following properties:—1. It contains powdered magnesium and a substance rich in oxygen; chlorate of potash, saltpetre, and sulphide of antimony answer the best. 2. This mixture does not disengage expansive gases; it cannot be inflamed by pressure or percussion. 3. It is therefore inoffensive. 4. It burns without detonating. The statement that it cannot be inflamed by pressure or percussion is difficult to believe, since most dangerous explosions have taken place with such a composition. Of course the materials must be ground separately and mixed gently, but even then, no matter how far the chlorate of potash may be diluted down, so to speak, with the two other substances, the statement that the mixture is safe against pressure and percussion is too serious, as well as too improbable, to be safely accepted on the authority of an anonymous newspaper paragraph.

The same journal goes on to state that the mixture can be used to give instantaneously any desired amount of light; the smoke is got rid of by burning the mixture in a lantern furnished with an open tube; the burning mixture chases before it the air contained in the lantern, but does not force its own smoke out; as the lantern cools, the products of combustion fall to the bottom thereof; the lantern can be cleared out afterwards by the aid of a bellows.

Next comes the use of the light in portraiture. To take instantaneous pictures it is necessary to use but one source of light. By making use of reflectors of silvered paper and screens of silk paper—probably thin oiled paper would answer—one has the power to produce lighting effects which will permit the taking of portraits anywhere, and that, too, instantaneously, which is an advantage; the flash lasts but from one-thirtieth to one-fiftieth of a second. This gives the following advantages:—(1), A better light during the dark days of winter; (2), sitters can be photographed in their own homes without difficulty; (3), children and animals can be readily photographed, no matter how much they may move about; (4), dark localities with persons in motion may be photographed; (5), by mixing in salts of lithium, barium, and so on, coloured pictures or objects may be well photographed.

Herr E. Vogel states that by the method he has photographed a group of six persons in a room of sombre colours, by the aid of two grammes of magnesium powder, with chlorate of potash added; the objective employed was an *aplanat* of Steinheil's, at a distance of 2·80 metres. All the members of the group gave a start when the light flashed upon them, but no effect was produced thereby upon the sensitive plate, which proves that the contraction of their muscles took place after the exposure. Herr H. W. Vogel has taken a group at eleven o'clock at night with a Steinheil *antiplanat*, not stopped down. The group consisted of from twelve to fourteen persons. Two and a half grammes of Gædicke's mixture, containing three-fourths of a gramme of magnesium, were employed, at a distance of two and a half metres. No reflector was used, yet the negative is full of detail. It is necessary to prevent the direct light from the flame entering the lens, otherwise the plate will be fogged.

A SEARCH FOR A SUBSTITUTE FOR HYPO.

[American Convention.]

ONE of the most useful discoveries ever made in the art of photography was the fact ascertained by Sir John Herschel in the year 1819, that solution of sodium hyposulphite dissolves the chloride, bromide, and iodide of silver. When we take into consideration that this salt, although now made in hundreds of tons every year, was then only a laboratory chemical, and very little used, we are surprised that Herschel should have thought of using it. But he did use it, and photographers ever since have blessed him; that is, they have done so if they got clean

prints. But in spite of the fact of the wonderful solubility of the silver haloids in sodium hyposulphite, there are numerous drawbacks to its use, and various other compounds have from time to time been suggested as substitutes for this universal fixer of plates and prints. Sir John Herschel used other solvents for the silver salts, notably ammonia and solution of common table salt.

Fox Talbot also used a strong solution of common salt. But these solvents never entirely dissolved the silver haloids from paper, and the white parts of the picture gradually acquired a blue colour, which, Talbot said, was not unpleasant, probably because he could not do any better. Robert Hunt kept some of these salt-fixed pictures for eight years, and found that they changed very little, except the blue tint acquired by the white portions.

In regard to the use of ammonia, it was found to be a good solvent for the silver haloids, but it also attacked the picture, and there was danger of destroying it completely.

Among other solvents used by the early workers in photography is potassium bromide, which was employed by Fox Talbot, and strongly recommended by him. Gustave le Gray, of Paris, used this solvent in a bath containing 360 grains in a pint and three-quarters, the fixing taking at least three-quarters of an hour; and he says it is better to wait two or three hours. Le Gray also mentions the addition of ammonia to the fixing bath of sodium hyposulphite, and recommends one fluid ounce to every quart of bath, which has a strength of about one in ten. He says this addition gives very pure whites; but the pictures were not permanent.

During the last year or two the question of using some other solvent for the silver haloids used in photography has again come up, and two substances have been tried—sodium sulphite by Captain Abney, and ammonia by a Scotch photographer, whose name has escaped me. In the case of the sulphite of sodium it was found to be too weak a solvent to use as a substitute for hyposulphite, although Captain Abney placed on record his work with it and made a table of its solvent power, which was published in the journals.

Thinking I might find something interesting in this question of the solubility of the silver haloids in various chemical solutions, I have made a number of experiments, which I desire to place on record. Although I have not been able to find a chemical compound that will supplant sodium hyposulphite in the fixing bath, yet I have experimented with materials that are solvents of the silver haloids, and this in no mean degree. In every scientific investigation the failures are often of as much importance as the successes, and with this idea in my mind I beg you will accept with charity this record of imperfect work done in the spare hours of a life that is full of engagements and calls to duty.

In the first place, I made a solution of silver nitrate of such a strength that one cubic centimetre of it would give 0.01830 gramme of silver bromide, 0.02290 gramme of silver iodide, or 0.01396 gramme of silver chloride, according as the precipitant was bromide, iodide, or chloride of an alkaline metal (potassium or sodium). To put this in other words, every hundred parts of the solution would give 1.830 parts of silver bromide, 2.290 parts of silver iodide, or 1.396 parts of silver chloride. The first series of experiments was with silver bromide.

Taking the solution of silver nitrate mentioned above, 25 cubic centimetres were used for each experiment and carefully precipitated with potassium bromide, so as to insure the least possible excess of the alkaline haloid. By this method there was secured a precipitate of silver bromide weighing 0.457 gramme (7.052 grains), which was carefully washed by decantation and drained from as much water as possible.

The first step was to find out how much of a given solution of sodium hyposulphite was necessary to dissolve this moist silver bromide under constant agitation. As the result of several experiments, it was found to require 8 cubic centimetres (about 2½ fluid drachms) of a solution of sodium hyposulphite containing 1 part of the salt in 6 of water, which is considered a fair strength for a fixing bath. This solubility of silver bromide means that in a bath of hypo 1 in 6, every part of silver bromide requires 2.9 parts of sodium hyposulphite for its solution.

Taking the same quantity of silver solution and producing the silver bromide in the same manner as mentioned before, the solvent action of ammonia was examined. The ammonia solution had a specific gravity of 0.97, and contained about 7 per cent. of ammonia gas. This solution was used upon the silver bromide without any perceptible solvent action, even when used to the extent of three times the volume of the hyposulphite before mentioned. It appeared that this strength of ammonia was the greatest that could be conveniently used in practice, and, therefore, no further experiments were made with solutions of greater strength.

The next step was to see the effect of an addition of sodium hyposulphite to the above ammonia mixture containing the silver bromide still undissolved. On adding 4 cubic centimetres (about 1½ fluid drachms) of a solution of hyposulphite (1 in 3) complete solution took place. Hence, in presence of a 7 per cent. ammonia solution, 1 part silver bromide requires about 2.9 parts of sodium hyposulphite for its solution, an amount exactly the same as in the case of the sodium hyposulphite solution of a strength of 1 in 6 mentioned above. But it must be remembered that the amount of hyposulphite in the bath was only 1 in 21 of water. Therefore the presence of ammonia facilitates the solvent action of the hyposulphite.

A solution was now made by taking equal volumes of a hyposulphite

solution (1 in 3), and solution of ammonia of 0.96 specific gravity. This gives a fluid containing one-sixth of hyposulphite and 4.87 per cent. of ammonia. Using the same quantity of silver solution, the silver bromide being prepared as before stated, it required 4.5 cubic centimetres (about 1½ fluid drachms) of the mixture of hyposulphite and ammonia to dissolve 0.457 gramme (7.052 grains) of the silver haloid. This means that in presence of 4.87 per cent. of ammonia, one part of silver bromide requires 1.6 parts of sodium hyposulphite for solution. So that in the presence of ammonia a hyposulphite solution of the same strength will dissolve nearly twice as much silver bromide as in the case of one where the ammonia is absent.

Another mixture of ammonia and hyposulphite was now made to see the effect of diluting the bath with ammonia solution. One volume of a solution of hyposulphite (1 in 3) was diluted with three volumes of ammonia solution of 0.96 specific gravity. This gave a mixture containing one-twelfth of hyposulphite and 7.32 per cent. of ammonia. Of this solution the silver bromide, as used in the previous experiments, required 7.5 cubic centimetres (about 2¾ fluid drachms) for complete solution. Hence, one part of silver bromide requires 1.37 parts of hyposulphite for solution in presence of 7.32 per cent. of ammonia. But such a solution of ammonia is too strong to work with practically, and nothing further was done with it, except to keep a record of the experiment.

As the solution of ammonia is such a pungent liquid to work with, it was thought that perhaps some of its salts might be substituted for it. With this idea in view, a solution of ammonium carbonate was made containing 1 part of the carbonate in 10 of water. Equal volumes of this solution and sodium hyposulphite (1 in 3) were mixed and used upon the silver bromide prepared as before. The same quantity of silver bromide required 7 cubic centimetres (about 2 fluid drachms) of the mixture for complete solution. Hence one part of silver bromide requires 2.53 parts of hyposulphite for solution in presence of 5 per cent. of ammonium carbonate. We here see that there is but little gain in the use of the ammonium carbonate, and that it is not at all equivalent to ammonia.

Other salts of ammonium were suggested as possible solvents, and the chloride was next tried. A solution of sal ammoniac (ammonium chloride) was made containing 1 part of the salt in 10 of water. This was mixed with its own volume of hyposulphite solution (1 in 3), and used on the same quantity of silver bromide as in previous experiments, and prepared in exactly the same way. Of this mixture the silver haloid required 7.5 cubic centimetres for complete solution. This means that 1 part of silver bromide requires 2.73 parts of hyposulphite for solution in a bath containing 5 per cent. of ammonium chloride. Therefore the presence of ammonium chloride is no material gain as an addition to the hyposulphite bath.

One other salt of ammonium was available, and it was thought it might possibly prove useful; this was the acetate. To make this salt, ordinary acetic acid was taken and neutralised with strong ammonia. The solution thus obtained had a specific gravity of 1.055, and contained about 30 per cent. of ammonium acetate. One volume of this solution (which was slightly alkaline with ammonia), and one volume of hyposulphite of sodium solution (1 in 3), were mixed and used on the silver bromide as before. It required 6 cubic centimetres of this mixture to secure complete solution. Hence 1 part of silver bromide requires 2.2 parts of hyposulphite in presence of 15 per cent. of ammonium acetate. Comparing this with a solution of hyposulphite of the same strength (1 in 6), but without the ammonium acetate, we note a gain of solubility, but the large quantity of acetate necessary to secure it makes the mixture too expensive and not worth considering from a practical standpoint.

ARTHUR H. ELLIOTT, PH.D., F.C.S.

(To be continued.)

Our Editorial Table.

A CONVENTION GROUP.

By JOHN STUART, 120, Buchanan-street, Glasgow.

THOSE of the members of the Convention who were posed on the rocks at Tarbert to have a group taken will remember among the numerous cameras erected on that occasion the very large one brought, with others of smaller dimensions, by Mr. John Stuart, of Glasgow, and which was the Triton among the minnows. That very excellent work was performed by this magnificent field-piece on that occasion we have for some time been aware, and the result is now before us.

The small-sized group which we issued a fortnight ago contained a goodly proportion of those who made up the party on the occasion referred to; but, in this large group, Mr. Stuart had been fortunately able to secure the presence of several who "made tracks" for their own cameras the instant the lens was capped, for there were many enticing subjects in the immediate vicinity, and the steamer by which the excursionists were to return was quickly expected to appear.

With a generosity which does him credit, Mr. Stuart, the artist, has placed his large group on the market at a price so low that no

one who desires to obtain a copy of this admirable group could possibly hesitate in securing it. The prices and details are to be found in our advertising columns.

The dimensions of this noble picture are 18x15 inches, and it is issued in two styles of printing, silver and platinotype. For an expenditure of from 3s. to 5s. 6d. photographers and photographic *cognoscenti* have it in their power to place on their walls a work of unsurpassed merit and interest. The individual figures of the group are large and distinct, and Mr. Stuart is entitled to the highest credit for having made such an excellent photograph, especially under the somewhat hurried conditions which prevailed at the time.

ILLUSTRATED CATALOGUE OF THE PHOTOGRAPHS IN THE NEWCASTLE JUBILEE EXHIBITION.

A SIXPENNY catalogue is no great feat in itself, but this one possesses special claims on our notice, for not only is it illustrated, but the illustrations are copious and printed in an admirable style. It contains not only the catalogue of the exhibition of photographs still open to inspection in the Newcastle Exhibition, but is embellished with a fairly large collection of the principal photographs in the exhibition. These are well printed, and, taken all in all, it is the cheapest sixpennyworth we have seen in connection with art photography. The publishers are R. Robinson & Co., printers and publishers, 56 to 66, Side, Newcastle-on-Tyne.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 11,136.—“Process and Means for the Production by the Zincographic Process of Imitation Wood, Copper, or Steel Engravings.” H. BOGAERTS.—*Dated August 15, 1887.*

No. 11,289.—“Improvements in Coloured Photographic Printing.” J. GRETH.—*Dated August 18, 1887.*

PATENTS COMPLETED.

IMPROVEMENTS IN LENS SHUTTERS AND CAMERA FRONTS.

No. 12,238. JOHN EDWARD THORNTON, 3, New Lorne-street, Moss Side, Manchester.—*September 27, 1886.*

THE improvements which are the subject of this invention are threefold, and are hereinafter more definitely described, and have for their object, firstly, the construction of a lens shutter which can be made to operate and admit light through the lens to the sensitive plate in a photographic camera either instantaneously or for a lengthened period; and, secondly, to provide means to show or indicate outside whether the shutter is open or closed; and, thirdly, to reduce the number of loose parts and also the bulk by placing the shutter so as to work inside the camera front and behind the lens. In this case the shutter is always attached to the camera ready for use, and the usual cap may be used for exposing instead of the shutter, if desired, without detaching the said shutter from the camera.

In constructing a lens shutter according to my invention I form a box-shaped casing (hereinafter called the case), which may be made to fit on the hood of lens, as usual, or may be made to form part of the camera front (as hereinafter described), and having an aperture through the same for the passage of light. In the said case I insert two rollers working in suitable end bearings. One of the said rollers contains a spiral spring, and is hereinafter called the spring roller; this roller is provided at one end with a one-toothed ratchet and a spring catch to engage with the same, for the purpose of allowing extra tension to be put on roller when required, so as to cause the shutter to work quicker. The other roller (hereinafter called the winding roller) is provided at one end with a ratchet and pawl or catch, to prevent a reverse action of the said roller. A flexible blind of material impervious to light, and having a suitable-sized aperture therein to allow the passage of light, is attached by its two ends to the two rollers, so as to admit of being wound from off one roller on to the other.

When the blind is wound from off the spring roller on to the winding roller it causes the spiral spring to coil itself tighter and so put tension on the blind. When the pawl is thrown out of gear with the ratchet the blind, being released, winds itself back again on to the spring roller, and the aperture in blind allows light to pass through whilst it is passing across the lens.

In carrying out the first part of my invention I place on one end of the winding roller to which the ratchet is attached a small pinion, which is made to gear into a toothed wheel, which I call the detent wheel; the number of teeth on this wheel are so calculated that when the blind has partly wound on to the spring roller, and the aperture in the said blind has come opposite the lens, and the shutter is open, the said wheel shall have gone through one complete revolution.

Near the periphery of this said wheel a small stud or stop is fixed. A lever, for the purpose of actuating the release, is pivoted to the side of case, and a small detent or stop is pivoted to this lever in such a manner that when the said detent is turned down it will come in the plane of the stud on detent wheel, and thereby arrest the motion of the said wheel after one revolution, and when turned over in the other direction it will be out of the plane of the stud, and so allow the free revolution of the said wheel. A spring pressing against the lever keeps it out of contact with the detent wheel until desired.

To set the shutter for an exposure the blind is wound on to the winding

roller and the pawl is put into gear with the ratchet to prevent its unwinding. If it is desired to give an exposure of short duration (commonly called instantaneous) the detent is turned over out of the way of the stud. The detent lever is so pivoted that when pressed the other end lifts up and throws the pawl out of gear with the ratchet on winding roller. The blind, thus released, instantly winds itself on to the spring roller, allowing the passage of light through the lens during the passage of the aperture in blind, and again closes the lens. If it be desired to give an exposure of longer duration the detent catch is turned over towards the detent wheel. When the lever is pressed down the detent is caused to come in the plane of the stud and the pawl is thrown out of gear, thus releasing the blind and causing the detent wheel to revolve. After one revolution of the said wheel the detent catches against the stud and so prevents the wheel from revolving any further, thus causing the shutter to remain open as long as the detent lever is pressed down. When the pressure is released the spring pressing against the said lever causes it to rise and allow a further revolution of the detent wheel, thus allowing the shutter to close. A stop spring operates against the pawl to prevent it falling into gear with the ratchet during a lengthened exposure, or any other suitable device may be used.

The usual pneumatic cylinder, piston, and ball, may be attached, if desired, for the purpose of actuating the detent lever in such a manner that the shutter will remain open as long as the ball is pressed and close when the pressure is released.

In carrying out the second part of this invention I attach a pinion to the detent wheel axle so as to revolve therewith; a toothed wheel is made to gear into this pinion, and the number of teeth are calculated so that this wheel shall make one revolution while the blind winds completely off one roller on to the other.

A pointer or index finger is attached to this wheel and indicates on a dial or plate whether the shutter is open or closed. By turning this wheel backward through one revolution the blind may be wound on to the winding roller more readily than by several turns of the said roller.

A brake for regulating the speed may be caused to operate against the indicating wheel, and may be adjusted by a screw, spring, or other suitable device.

In carrying out the third part of this invention I construct a camera front in the form of a shallow box or case, with an aperture through the same, and I place the shutter inside the said case so as to work behind the lens. To the back portion of this case the bellows are attached, and to the front portion the lens may be attached in the usual way or the ordinary lens panel inserted.

By inserting the shutter in a camera front, as described, the whole is more compact than when the shutter is in a separate case, and it does not interfere with the free use of the various parts of the camera.

In order not to unduly increase the thickness and bulk of the camera front and still make room for the rollers to work free, I make openings in the case to allow the rollers to partly project, and I cover the projecting parts each with a half tube or box-shaped covering, to make the whole light-tight; or the case may be thicker, if preferred, and the rollers placed entirely inside. The case may be made of wood, metal, or other suitable material, either wholly or in part combination.

I do not bind myself to any particular position of the parts, and the rollers may be placed in any convenient position, either horizontally or vertically.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
August 30.....	Bolton Club	The Studio, Chancery-lane, Bolton.
31.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C
September 1.....	Bolton Photographic Society	
1.....	Glasgow Photo. Association.....	Philosophical Soc. Rms., 207, Bath-st.
1.....	Leeds	Philosophical Hall, Leeds.
1.....	London and Provincial	Mason's Hall, Basinghall-street.
2.....	Halifax Photographic Society.....	M. Manley's, Barum Top.
2.....	Yorkshire College	

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. William England, Vice-President, occupied the chair.

Mr. Friese Greene exhibited some photographs of the eclipse of the moon of August 3 last, taken by Mr. T. G. Gwilliam, F.R.A.S., and himself, with a Newtonian reflector six and five-eighths inches in diameter and six feet focal length; the exposures given were from a quarter of a second to eight or ten seconds. Mr. Greene next exhibited an instrument called the “phantoscope,” for projecting figures upon the screen, to which figures apparent motion could then be given.

After some general conversation the meeting broke up

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

At the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, on Thursday night, August 18, Mr. A. L. Henderson presided.

Mr. H. M. SMITH exhibited a Watson's new metallic developing tray, nickel plated, furnished with a bent lever arm for raising the plate at will. He stated that the Eastman Company had just brought out a new roller slide, so light that the slide, with enough paper for forty-eight whole-plate negatives, weighed but two and a quarter pounds.

Mr. J. J. BUGINSUAW said that the difficulty with roller slides is that before

developing only in about one case in ten is it possible to find out where to cut the paper; one way of doing it is to measure the paper from the starting point. Ordinarily it is not unusual for the operator to cut a picture in two.

Mr. E. G. DERNBUSCH exhibited some negatives developed after they had been wrapped in tissue paper and in old newspaper fragments outside the tissue paper; the printed matter appeared upon the negatives.

The CHAIRMAN remarked that in one of the plates the printing was "fuzzy," as if the newspaper had not been in close contact.

Mr. A. HADDON saw no reason why the effect should be prevented by the interposition of tissue paper.

The HON. SECRETARY said that the old question of what is the best method of packing plates when travelling seemed not yet to have been satisfactorily answered.

Mr. A. MACKIE responded that they should be packed face to face with nothing between, and each pair kept from sliding over each other by means of gummed paper at the corners.

Mr. WILLIAM ENGLAND stated that in some negatives sent to his son to print inequalities on the backs of the plates had produced images of themselves in the films.

Mr. A. COWAN said that the plates had evidently been packed in an unsafe light, and the inequalities had therefore produced a latent image of themselves through the glass.

The CHAIRMAN asked if any one present had photographed lightning flashes during the late storm.

Mr. J. TRAILL TAYLOR had heard of a photographer who had photographed a vase of flowers in his studio by the illumination afforded by successive flashes of lightning.

Mr. W. M. ASHMAN said that a developer containing sulphite of soda, recommended by Mr. Lincoln Adams in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, gave the best negatives he had ever seen; the formula was really worth trying.

The CHAIRMAN said that ammonia was best for very rapid plates, where density was required without frilling.

Mr. TAYLOR was of a different opinion, for with proper proportions of the carbonates of potash and soda density could be obtained, and the mixture answered equally well for paper and glass plates. Such a developer had been given by Mr. Wellaston at the Convention, and the speaker could strongly recommend it. It consisted of:—

Solution A.

Sulphite of soda	6 ounces.
Hot water	32 "
Make slightly acid with citric acid, and when cold add	
Pyrogallol.....	1 ounce.

Solution B.

Carbonate of soda	3 ounces.
Carbonate of potash	1 ounce.
Water	32 ounces.

To develop, mix equal parts of A and B, then add two parts of water. He often added double that quantity of water.

Mr. ENGLAND remarked that it bore much resemblance to Beach's formula.

The CHAIRMAN was of opinion that the more rapid the development the more brilliant was the picture, therefore he objected to the use of sulphite of soda.

Mr. TAYLOR had a batch of foreign plates which gave fog, and had no other plates available to expose upon a house they were pulling down opposite his office; how should he develop these plates without fog?

The CHAIRMAN said that before use the plates should have been exposed to sunlight, then treated with weak nitric acid and water in the dark; they would then have given unvelled negatives.

Mr. TAYLOR was aware of that, only in such cases he used hydrobromic acid, but in the one under consideration the exposures had already been made.

Mr. MACKIE thought that in such cases fog might be avoided by long exposure and very restrained developer.

Mr. TAYLOR responded that that also was his opinion, so he had given fifteen instead of two seconds' exposure to each plate; he should use the developer already mentioned, and when the image appeared would apply a restrainer freely. He thought of giving two minutes' exposure on the morrow, and applying an acid developer as in the old dry-plate days.

Mr. A. HADDON thought that one reason why sulphite of soda produced green fog was that it was a solvent of silver, so might tend to deposit finely divided silver all over the plate. Bromide of potassium was also a solvent of silver.

Mr. W. H. HARRISON thought it to be an open question whether green fog were not an organic dye.

Mr. AYRES wished to know the cause of the perishability of some photographic enamels.

The CHAIRMAN responded that they were perishable when dropped under a cart-wheel.

Mr. J. F. PEDSGROVE was elected a member of the Association, and the proceedings closed.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

ON Tuesday, August 16, the ordinary meeting of this Society took place at Myddelton Hall, Islington.—Mr. A. Mackie, Vice-President, in the chair.

The minutes of the previous meeting having been read, Mr. MACKIE stated that at the previous meeting he said that Mr. Smith had been very accurate in his paper, not that he had attempted to be very accurate. With this correction the minutes were confirmed.

Several views taken at the recent excursions were shown by Mr. Higgins and others.

Mr. A. LITTLE exhibited an example of pinhole photography.

Mr. E. DUNMORE showed some curious crystals which had formed in a jar in which citrate of silver had been kept.

The HON. SECRETARY called attention to a formula for backing gelatine

plates which appeared recently in THE BRITISH JOURNAL OF PHOTOGRAPHY, and said that he had found it very easy to prepare and extremely useful in the prevention of halation.

Mr. DUNMORE said he always used burnt sienna and did not trouble to wash it off before developing his plates.

The CHAIRMAN then invited the members to continue the discussion upon Mr. Octavius Smith's paper *On Systems of Numbering Photographic Lenses and Diaphragms*, which had been adjourned from the previous meeting.

Mr. DUNMORE advocated the system adopted by the Photographic Society of Great Britain.

The HON. SECRETARY considered the discussion at the previous meeting turned upon the lines of experience *versus* exposure tables, instead of dealing, as he thought should have been the case, with the tables themselves and other aids to exposure. He agreed with those members who had previously spoken, that it was better to trust to one's experience than to trouble and perplex oneself with the many tables that had been compiled; but in the case of a person just commencing photography, and without an experienced friend at his side to assist him, he thought exposure tables were better than nothing at all to guide him in his difficulty.

The CHAIRMAN said it was necessary to have some system by which we could convey our ideas to other people, and whatever system was to be adopted should be an universal one—one easy to work and easy to apply. He was in favour of the system recommended by the Photographic Society of Great Britain.

Mr. DUNMORE said in ordinary landscape work he only used two stops, namely, $\frac{1}{2}$ and $\frac{1}{4}$.

Mr. GEORGE SMITH used six steps for his combination set of nine lenses. He thought Mr. Octavius Smith had adopted the main principles of the area system. The public hated figures, and, still more, formulae. Mr. O. Smith was quite wrong in his application of the area system.

Mr. OCTAVIUS SMITH then proceeded to reply to the various arguments which had been brought up in the discussion. It appeared, he said, that one of the chief faults in this paper was its extreme accuracy. So far as the paper was theoretical he considered this point a great compliment, in the practical part, on the other hand, this extreme accuracy did not exist. Mr. Smith then proceeded to show, by reference to Mr. George Smith's published article on the area system, that the error which he had pointed out in his paper really did exist. In some cases it amounted to as much as one hundred per cent. With regard to a standard aperture, if $\frac{1}{8}$ were taken as the unit we should get as comparative exposure numbers many more fractional numbers than if we took $\frac{1}{2}$, and he thought that private ideas ought to be sacrificed to some extent for the sake of uniformity. The Photographic Society of Great Britain had carefully chosen a unit for the benefit of the photographic world in general, and, unless very good reason could be given for using another standard, it would, he was sure, be better to adopt theirs. The subject of experience *versus* exposure tables was, Mr. Smith thought, somewhat beside the question; it would be very foolish for any one knowing from experience the necessary exposure to use exposure tables. Mr. Smith mentioned two incidents which had by chance come under his notice during the past fortnight. A very experienced photographer who had just returned from a tour in the North had given all his plates about four times the proper exposure; another very successful worker, with over twenty years' experience, having focussed the interior of a church, exchanged the stop for one of half the area, and could hardly discover the difference in the illumination of the two images. In conclusion, he said that in making these remarks and in writing his paper it was not his object to prove that exposure tables were safer than experience or *vice versa*; he took for his standpoint this fact—that various systems of numbering stops existed, and the problem he had sought to solve was which is the best.

Excursions were arranged for August 27, to Oakleigh Park; and September 3, to Mill Hill.

The next meeting will take place on September 6, and the discussion will be upon *Lantern Matters*. Visitors are invited.

Correspondence.

Correspondents should never write on both sides of the paper.

FIFTY SITTINGS FOR A PORTRAIT.

To the EDITORS.

GENTLEMEN,—Mr. R. Barrett's reply to the question at issue, I think, cannot be taken as successful and satisfactory. In his former article he introduced the names of celebrated artists and told us how many sittings they wanted to produce a portrait, and that nowadays by the aid of photography we have done with such troubles. Now to what comes the help Mr. R. Barrett advises us to obtain from photography? He says, in the first instance, the "independent" artist shall take into account a photograph which the people, ordering a large portrait, and all their friends, regard as a successful one. I venture to say, when the "independent" artist would allow at all such interference and try this way to execute his work, it would greatly embarrass him and surely not lessen his labour in any direction, including the sittings, as every artist of experience will testify, provided his aim being a work of art. Mr. R. Barrett himself testifies this indirectly, perhaps unconsciously, by his remark: "Of course there are many artists like 'A Painter' who will not accept the assistance of photography, such as Sir F. Leighton or Sir J. E. Millais." Then he goes on to say: "But there are also many exceedingly good men, upon whom fortune has not smiled so kindly, who are obliged to humble their pride and accept photography willingly as a

help." What can this suggestion mean? Does it mean that these exceedingly good men have not had the opportunity to learn the necessary technical adroitness of drawing sufficiently and therefore must look out for help? In such case they cannot come in consideration here at all, because it must be expected of any one who claims to be classed as a portrait painter, that he is possessed of sufficient preliminary knowledge, skill, and practical experience, to execute his work. In possession of such qualities it will be of no consequence, indeed, to have resource to any such help as Mr. R. Barrett recommends. Besides this, the principle of art, as sanctioned by all the art academies everywhere, has been, and is still, that any work not based entirely upon the study of nature cannot come in the category of art. Therefore is it not pride or caprice, as Mr. R. Barrett seems to fancy, which compels Sir F. Leighton and all the rest to have nature only for a guide, but it is because this grants the only means to come to any satisfactory result, and thus your correspondent "An Artist" speaks out rightly in a few words all that can be said about the whole matter, namely, "No true artist would condescend to use photography as a help, and if he did it would only lead him astray." The other remarks in Mr. R. Barrett's answer I consider as irrelevant, and do not care to reply to, and I think we have had now enough said about the question on both sides, so as to enable any impartial reader who cares for it to draw his own conclusion, and I therefore propose to drop the matter.

Thanking for your kindness to lend space for my notes in your valuable JOURNAL,—I am, yours, &c.,
A PAINTER.
Liverpool, August 22, 1887.

To the EDITORS.

GENTLEMEN,—Mr. Redmond Barrett need not have excepted Sir Frederick Leighton from those artists who accept the assistance of photography. Sir Frederick told me himself that the portrait he painted two years ago of a daughter of Lord Rosebery was done chiefly from photographs, as there was a difficulty about getting sittings. Your anonymous correspondent signing himself "An Artist" asserts that "no true artist would condescend to use photography as a help, and if he did it would only lead him astray." Hence, gentlemen, we learn not only that "photography is photography, but art is art," but also that Sir Frederick Leighton cannot be an artist!—I am, yours, &c.,
1, Cheniston Studios, Kensington, W.
HERBERT S. MOBERLY.
August 20, 1887.

To the EDITORS.

GENTLEMEN,—Just a few words on the question between artists and photographers. A year or two ago there was a short anecdote in one of the comic papers that seems much to the point. A lady had a portrait painted, and when it came home complained that it was not a bit like. Said the painter, "If you wanted a likeness, madam, you should have gone to one of those photograph fellows. I am thankful to say that I am an artist." (I quote from memory.) And *apropos* of nothing in particular, I have somewhere seen a signboard which read, "Plumber, Artist, and Glazier." Can this be the artist who so anxiously disavows ever receiving aid from photography?

Yet I think that photographers have brought on themselves many of the impertinences from the minor artists of which they complain. Many of us were rather astonished that the judges in a recent exhibition seemed to be selected for their ignorance of photography, and certainly one at least of their decisions excited universal wonder. The artists (I mean painters) never did such a foolish thing as to leave the judging of their works to photographers. If they did, I fancy some even of the R.A.'s would be placed in a back seat. I confess I do not like all this fawning on artists for a little praise and encouragement. We deserve what we get—more kicks than halfpence. Why can't we go our own way and stand on our own legs?—I am, yours, &c.,

PHOTOGRAPHER (Not Photographic Artist).

To the EDITORS.

GENTLEMEN,—I hope you will forgive me for writing a few lines in answer to "A Painter," although he addresses you (not me) in his letter which appeared in the last issue of your JOURNAL. I am responsible for his displeasure, and now I am no longer "laid up" I do not wish to appear to shirk the duty of giving him every satisfaction.

In the first place, I would recommend him before going any further into this matter to read over carefully the original "par" which has led to this little storm. I think by so doing he will find that he has somewhat got "the wrong end of the stick." I do not think I ever suggested *making artists* by the aid of photography, especially of such calibre as those for whose memory he is so particular. I feel sure no man has a greater respect for their works than I have. Nevertheless, I still hold that photography *could* have been a help to them if they *would* have condescended to use it. A stick or a crutch is no use or help to a lame man if he won't use either, and to such as *won't* use it photography is similarly placed.

"A Painter," again, mentions that all paintings which have received help from photography as being only *imitations*. That point I consider answered by my last letter.

In your correspondent's last letter (forgive me if I am wrong) I seem to

think that the question is suggested, "Will photography help to produce such artistic work as that left to us by Sir Joshua Reynolds and Sir Thomas Lawrence?" I must say I think this a very foolish way of putting it, and one that can serve no practical good. The best way of answering it that occurs to me is by asking, "How many artists have we to-day who—with or without the aid of photography—can produce such works?"

If my last letter will not prove sufficient to convince "A Painter" that there are many good artists who accept photography as a help, I will have much pleasure in giving further examples. I also hope that he realises the fact that works of art—*real art*—can be produced *without* showing the *strokes of the brush*. I can also satisfy him on this point further, if he desire it. I presume he knows that sculptors (I hope I may term them also *artists*) in very many cases receive *help from photography*.

To your correspondent who signs himself "An Artist" these lines should be an answer, as he only seems to say "Ditto" to "A Painter." He says "art is art;" he seems to possess enough of it not to offer a very strong opinion. If he would like to ask any special question I will be happy to give the best answer I can. I can say no more.

I beg to thank "One who finds Photography a Help" for his kind offer to take my part. Had I not been unwell and missed reading my JOURNAL I certainly would not have let "A Painter" think I was *unable* to answer his *easy* question.—I am, yours, &c.,
REDMOND BARRETT.

THE FLORENCE EXHIBITION.

To the EDITORS.

GENTLEMEN,—The translator was correct in presuming that the exhibitor of the frame of transparencies at the Florence Photographic Exhibition was Mr. A. Cowan—or rather they were transparencies produced by Mr. Cowan on his chloride plates and exhibited by us.—We are, yours, &c.,
MARION & Co.

22 and 23, Soho-square, London, W., August 23, 1887.

PHOTOGRAPHIC ENGRAVING.

To the EDITORS.

GENTLEMEN,—Mr. Stebbing, in your issue of August 12, 1887, describes a process of photographic engraving, the invention of M. Sartirana, which was brought before the notice of the last monthly meeting of the Photographic Society of France. I beg to call attention to the fact that I patented the method twenty-one years ago, namely, May 9, 1866. The following is copied from my specification:—

"Raised surfaces prepared as above described (see patent) may be used advantageously to produce engraved plates, by machine copying or ruling with the instrument known as the pantograph, the irregularities of the surface which is being copied producing undulations in the lines whilst the instrument rules on the copper or other plate, as is well understood."

I tried to get the patent taken up by the Woodbury Company, which was then working at Brompton, but I met with no encouragement.

In the patent will be found the germ of Woodbury's latest process—Stannotype. My use of the tinfoil on a gelatine relief was, however, for another purpose; but as applied to the gelatine relief, could be used for Stannotype printing.

In this country, unfortunately for inventors, "the voice of one crying in the wilderness" has to be pitched very high indeed before you get attention. The patent never brought me in a penny.

I shall feel obliged by your calling Mr. Stebbing's attention to the facts I have given above.—I am, yours, &c.,
D. C. DALLAS.
9, Farnival-street, London, August 23, 1887.

A QUESTION OF COPYRIGHT.

To the EDITORS.

GENTLEMEN,—What is the law of copyright in the following case? A statue of the Queen has been erected in this city, and was unveiled last week. A local photographer is advertising that he has the sole right of photographing this statue, and cautions other artists from infringing what he calls his sole right of reproducing the same.

Can any copyright exist in a public statue any more than in a public building—to wit, the Houses of Parliament, Albert Memorial, or the elaborate monumental structure where once stood Temple Bar?—I am, yours, &c.,
A HAMPSHIRE PHOTOGRAPHER.

Winchester, August 23, 1887.

THE PORTRAIT NEGATIVE.

To the EDITORS.

GENTLEMEN,—Feathers are said to show how the wind blows, and the correspondence which has appeared in your excellent JOURNAL may be taken as indicating the direction of the wind with regard to the portrait negative. Allow me, however, to congratulate your correspondents, and all interested in the negative, on the resurrection of a venerable friend from the dead—if one can be said to be dead who has never departed out of life.

The law is brief and plain, as shown in the extracts from Mr. Foster's articles in the letter from "J. F." It gives to the photographer his much-prized negative and it also gives to the sitter his much-valued protection.

Evidently your correspondents have been ignorant of the existence of this law, and this being so it is not to be wondered at that sitters, also, are ignorant of it, and that consequently no registration by them of their copyright takes place.

With professional photographers I find no fault. I have no need to do so. I believe that they are an honourable body of men, in whom their clients may have the fullest confidence. Yet among photographers, as among other honourable professions, there are to be found unscrupulous persons without knowledge of moral right, with only selfish instincts, and these very strong, who would for gain rob the hands that gave them bread. These persons are not a new importation into the profession. Mr. Foster advised caution when dealing with them.

The law, on the resurrection of which I have offered congratulations, deals with these persons and clearly settles the pound of flesh, and, should it become generally known, clients will in many cases alter use and wont. I may add that the law of Copyright may be had post-free for fourpence from Eyre & Spottiswoode, East Harding-street, E.C. It is dated 1862.—I am, yours, &c.,
M.LLIE.
August 19, 1887.

BLUE COPYING INK ON PHOTOGRAPHS.

To the Editors.

GENTLEMEN,—Having occasionally a large number of photographs to mount—taken in all quarters of the globe—I am often very much surprised that publishers, and sometimes even photographers, have recourse to a rubber stamp and copying ink in order to advertise themselves; foreigners are, as a rule, the greatest sinners in this respect, though a few English photographers sin grievously. Fancy having a hundred or so 12 × 10 photographs to mount, each one having copying ink on the back; they must be wetted and placed on the slab of glass or piece of paper singly in order to apply the mountant, for if you attempt to place another print on top of "Tom Jones, publisher"—hey, presto! the transfer is complete even to the punctuation. "Tom Jones" on an Italian sky is unique—almost equal to the balloon system of advertising soap.

My object in writing this to the JOURNAL is to ask all photographers who use copying ink to refrain from doing so; it will not certainly add to the permanence of the print. Placing paper between the prints disposes of the difficulty to some extent, but why not write or print your name and address on the negative?—it will appear then, whether the print be mounted or unmounted; or simply use a steel dye minus ink. Please do so, and less big D's will be uttered by the useful people we call mounters.—I am, yours, &c.,
MOUNTER.

Exchange Column.

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

Will exchange new seven-string silver-plated banjo for presses, backgrounds, or accessories.—Address, CURTIS, Sinton, Surrey.

Wanted, camera and lens by good maker in exchange for tricycle with ball bearings, luggage carrier, and lamp.—Address, S. NICHOLS, Railway-road, Ormskirk.

Will exchange Dallmeyer's 3d patent portrait lens for 2d patent portrait lens of same maker.—Address, I. GRIMSHAW, Dale-street, Haslingden, near Manchester.

Will give quarter-plate camera, lens, and stand, with six Tylar's double slides, for Gem or Victoria camera and lenses.—Address, W. R. FAIREY, Harrold, Bedfordshire.

Wanted, stereoscopic camera in exchange for half-plate instantaneous lens, adjustable diaphragms, and patent shutter (Lancaster's).—Address, LINDSAY, Pine-grove, Solkirk.

Answers to Correspondents.

K. W. (South Shields).—We must decline giving any opinion concerning paper of which we know nothing.

D. S.—The most that we can do in the case mentioned is to receive the letter and forward it to the required destination.

JUBAR.—As you describe the lens we cannot understand its construction. It will only cost you a few pence to send it to us for examination.

ALEX. TAYLOR.—Get a doublet lens of wide angle, such as one which with a focus of four and a half or five inches will cover a whole-plate, or in these proportions.

R. C. SAWYER.—If the albumen behaves as you describe it is clear that you have not "whipped" it sufficiently to produce limpidity. It should be beaten up until the vessel containing it can be inverted without any running out.

SAVE ALL.—It is no use saving the developing solution from dry plates, because it contains no silver. Indeed, if you add this to the residues containing chloride it may do harm, inasmuch as the ammonia might dissolve some of it, hence it would go down the sink when the residue was decanted.

W.—Several different methods of producing type blocks have from time to time been given in this JOURNAL, but none of them have been all that could be desired. Type blocks in half tone are, however, produced which, with the aid of the engraver to touch them up, and with careful printing, yield excellent results, but those who make them preserve the details of the processes they employ as trade secrets.

F. A. writes to ask us the discount a certain maker of dry plates allows off his list price.—We cannot answer the question. Why does not our correspondent write to the maker direct for the information?

LOLO inquires: "Can you tell me if using gallic acid in mistake for pyrogallie acid would have the effect of frilling a gelatine negative so badly that the entire film slipped off, leaving the glass clean?"—In reply: We should not expect it to have any such effect. The frilling must have been brought about by some other cause.

T. HILLIER.—Although you have used the lime toning bath, "which is said to give black tones," you clearly have not obtained them, nor will you from such negatives as you are using. Weak and feeble negatives will never yield prints with rich black tones whatever bath may be employed. The fault lies not with the bath but with the negatives.

S. RAY asks if a paraffine cask will do for collecting the silver residues. He says that, although he has washed several times with soda and water, and has kept water standing in it for more than a week, he cannot get rid of the smell of the oil.—The cask will do quite well for the purpose, and the smell of the paraffine will do no harm whatever.

S. J. J. wishes to know if prints on bromide paper cannot be developed with alkaline pyro instead of ferrous oxalate.—Prints on bromide paper can be developed with pyrogallie acid, but ferrous oxalate is preferred on account of the better tones it yields. Moreover, the pyro has a tendency to stain the paper, hence such pure whites are not obtained with it as with the iron developer.

R. JOHNSON asks if it be necessary in making enlarged negatives that the transparency be by the carbon process, as he has been told it must.—It is not at all necessary that the transparency be a carbon one, as one by any other process will answer quite as well. All that is required is a good transparency for the purpose, and this can be made by any process. Ordinary dry plates are very generally employed now.

ALPHA.—1. We cannot give you any idea of the exposure required as you do not say the rapidity of the plates you are using. "Four times wet collodion" means nothing unless you define the sensitiveness of the wet collodion with which you compare your plates.—2. We have not tried the first shutter you name, and we know of no objection to the second.—3. Increasing the proportion of pyrogallie acid conduces to density.

W. C. says he has just made up a silver bath for paper, as he wishes to try his hand at sensitising his own, and complains that when the silver was added to the distilled water, which he obtained from a local chemist, it became "milky," and after standing for a time a white deposit settled at the bottom of the vessel. He asks if this is the general behaviour of the bath.—No, it is not. The fault lies with the water, which evidently contains some impurity, probably a chloride. If the water had been pure the solution would have been clear. If the bath be filtered it will probably work all right.

MR. G. P. CARTLAND, of Windsor, has been appointed Photographer to the Queen by warrant from the Lord Chamberlain.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, August 31, 1887, will be on *Stripping Films*. Saturday outing at Kew. Meet at bridge foot at six o'clock.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—Excursions, on August 27 to Oakleigh Park, train from Broad-street at forty-seven minutes past two p.m.; and on September 3 to Mill Hill, trains from Broad-street at twenty-seven minutes past two p.m., and from Moorgate-street at thirty-eight minutes past two p.m.

MR. B. J. SAYCE sends us a *Note-book for Photographic Exposures* made in connexion with roll holders. Those in common use hitherto do not, in Mr. Sayce's opinion, quite meet the wants of those who employ films, which has led to his having devised the one a copy of which is before us, and which, Mr. Sayce says, any publisher is at liberty to reproduce. It certainly forms a most complete note-book for the purpose intended.

PHOTOGRAPHIC SOCIETY OF INDIA.—First Annual Exhibition, 1888. 1. The Exhibition will be opened early in January for a period of about three weeks. 2. Medals will be awarded by judges to be appointed by the Society. 3. Photographs need not be framed, but they must be mounted, and in the hands of the Secretaries before January 1. 4. Carriage on exhibits must be prepaid and full instructions given as to return or sale. 5. Photographs to which medals are awarded will become the property of the Society, and the Society reserves the right of ordering further copies to be printed for distribution among members before a medal is despatched. The extra copies ordered will be paid for at fair rates. 6. The following medals will be open for competition:—Class I (open to the world), His Excellency the Viceroy of India's own special medal and the Society's gold medal for the best photograph in the Exhibition; a silver medal will be held at the disposal of the judges. Class 2 (open to the amateurs of India), silver medal for best photograph in the Exhibition; silver medal for best set of not less than four photographs; a silver medal to be at the disposal of the judges. 7. All exhibits to be forwarded to the Secretaries, Photographic Society of India, 8, Clive-street, Calcutta.

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THE EFFECT OF QUANTITY OF SOLUTION ON DEVELOPMENT.

RESUMING this subject where we left it last week we may now turn to the more purely practical side of the question, and consider how the matter of bulk of developing solution actually affects the character of the result. As may be gathered from what has already been said, we hold that, though the composition of the wet and dry plate developers is totally different and the manner in which the image is formed in the two cases equally distinct, yet in a general way the effect produced by increasing or diminishing the quantity of solution is similar in both cases. In the former, by limiting the quantity of developer, the silver which goes by deposition to form the image is concentrated and so leads to contrast, while in the latter the bromine liberated in the formation of the picture is in like manner utilised with a similar result.

In speaking of the wet plate developer we must be understood to refer to the processes of "silver development" generally, that is to say, those processes in which a soluble silver salt—usually the nitrate—is deposited by means of a reducing agent upon the exposed portions of the film. This method is equally applicable to dry plates, and before the introduction of the alkaline form was universally employed for the purpose. But this difference exists when operating upon dried films, from which all traces of free silver have been carefully removed; the silver is added directly to the reducing solution, whether gallic acid, pyro, or ferrous sulphate, instead of, as in the case of a wet plate, being derived from the excess of bath solution clinging to its surface.

Now it will be remembered that, in conducting this style of development of dry plates, and equally in redeveloping or intensifying films of any description in cases of under exposure or when the object is to subdue or hold in check violent contrasts, it is the practice to add the silver slowly and in very small quantity, which virtually amounts to using a large proportion of the reducing agent. On the other hand, where over exposure is the condition, or contrast is desirable, the silver is used more liberally, and the circumstances then more nearly resemble the application to the plate of a small quantity of developer.

We should, therefore, be guided by precisely similar ideas in the treatment of modern dry plates. It has been remarked in our former article that the difference in the results obtained by varying the quantity of developing solution may not be great, but there may be circumstances under which the very slightest variation should be seized as having importance, notably in extremely short exposures. The problem has long

been, as Colonel Wortley happily phrased it, "how to get most out of a plate." The Colonel's plan was to give the plate a preliminary soaking in dilute alkali previous to the application of the pyro, a method which may be considered to have for its *rationale* the conversion of the bromine dissociated by the action of light into less harmful alkaline bromide. The first attack of the developer is then made under conditions more favourable to the production of the best results, for not only is its alkalinity—and therefore its energy—not reduced by combination with the dissociated bromine, but, what is perhaps of higher moment, the *reversing* action of the latter is absent. All who have tried Colonel Wortley's plan know not only how it answers the intended purpose, but also how much more rapidly development takes place, especially in the early stage.

If so apparently small a matter as this exercise such beneficial results—results not otherwise obtainable by increasing the strength of the developer or "forcing," which only end in fogging the plate—it behoves us to avail ourselves of every means, however slight, tending in the same direction. This we can do by increasing the quantity of the developer, and in adopting that course we introduce not the faintest element of danger to counterbalance the anticipated benefit. If we resort to the preliminary soaking in ammonia, followed by washing, and then apply double or treble the usual quantity of developer, we may consider that we have done all it is possible to do in the way of making the most of an extremely brief exposure; and it is only under such circumstances that it becomes necessary to trouble with the niceties of manipulation.

Some of our readers may perhaps imagine that the same result can be arrived at by adhering to the normal quantity of solution and using a proportionately less quantity of restraining bromide, but such is far from being the case. At the precise moment of applying the developer to the plate, and at that moment only, similar conditions prevail; but instantly the smaller volume of solution commences to change its condition "by leaps and bounds," as compared with the greater bulk. Its active alkali is not only neutralised, but converted into equally active restrainer, and this in inverse ratio to its volume, so that in a very short time the solution which, if it had remained at its normal developing strength would have sufficed to bring out an image full of detail, is reduced to such a condition as to produce only a hard, under-exposed result.

It has been stated by Burton and others that the effect of

excess of bromide in the developer is merely to retard its action, and that if a sufficient time be allowed the final results will be identical with equal exposures, no matter how much bromide is employed. This is true to a certain extent only, namely, where an adequate, or we may say, a "full" exposure has been given. But when the exposure is curtailed to the utmost, it becomes important to work with as little restraining bromide as possible. It cannot be altogether dispensed with, especially when, as in instantaneous work, the development must be, in a measure, forced, certainly prolonged, but the quantity used should be reduced to a minimum. With such subjects or exposures, too, the character of the imago is formed at the earliest stage of development, and any error then is irremediable at a later stage. The late Major Russell pointed out years ago the importance of using bromide sparingly in the first stage of development, showing that a proportion which might be added with perfect impunity later on in the process would inevitably ruin the negative if employed at first.

The necessity, then, for commencing the development of a delicate subject with a solution which, while sufficiently restrained in the first instance to ward off fog in the later stages, will retain its original character with but comparatively little change, will be recognised by all who care to give the subject a moment's thought. And it will further be evident that the greater the volume of solution the greater its stability or freedom from tendency to alter during the process of development.

An absolutely perfect method of developing brief exposures will perhaps not be available until we can imbue the sensitive film with some substance which, while free from restraining or other injurious action, shall possess a stronger affinity for bromine than the silver compound forming the invisible image. In this manner we should render inert the dissociated bromine and prevent its reversing action: the preliminary soaking of the film in alkali only partially effects this by converting the free bromine into a restrainer devoid of reversing power, but it cannot prevent a partial recombination, the instant the film is wetted, between the bromine and the silver from which it has been loosened by light.

It is not only with instantaneous exposures that the increase of volume of the developing solution will prove useful, but in any case where it is desirable to subdue unnatural contrasts, as, for instance, in photographing dark interiors, woodland scenes, or any subjects where masses of heavy foliage, or rocks in deep shadow, have to be developed on the same plate as the unclouded sky. In such cases the employment of a large volume of solution, by diluting the restraining power of the liberated bromine, places less check upon the development of the feebler details, and these are consequently brought to printing value before the high lights have acquired too great density.

For cloud negatives, for copying black and white, and for all subjects where contrast is wanted, the opposite course should be pursued and the volume of solution kept as low as possible. But here it is obviously possible to produce the same or a greater result by the direct addition of bromide to the developer, if necessary; so that it is scarcely worth while to risk other troubles by unnecessarily cutting down the quantity.

To those engaged in the production of positives on gelatino-bromide paper, especially where a number of prints are developed in the same solution, the importance, in securing uniformity of result, of employing a considerable volume of developer, no matter whether it be ferrous oxalate or pyro, must be palpable. To expect any two successive prints to develop alike in a quantity of solution only sufficient for one

is to anticipate an impossibility; whereas, if the quantity necessary for a dozen or half a dozen be mixed at once and used for its proper number, the development of the whole would prove tolerably uniform.

A PRIZE of a thousand francs, or, in round numbers, forty pounds, is offered by M. Davanne for a process by which a plate combining the advantages of both gelatine and collodion may be manufactured, the chief conditions being great simplicity in the operations combined with extreme sensitiveness. Descriptions of the process sent in for competition should be very full, be accompanied by negatives and prints, and sent in before the thirty-first of December next.

RECENTLY we had an excellent opportunity of putting again to the test of practice the method we described a short time ago for combating violent frilling tendencies in a gelatine plate. We made two exposures of a certain subject upon plates which had been in our possession for a considerable length of time, but of whose properties we believed we had a complete recollection. To our surprise, however, the first plate we developed became covered with blisters directly after we put it to wash when removed from the hypo, and we were just in time to prevent a similar disaster with the second plate. We placed it, without fixing and after well washing the developer away, in a drying cupboard till it was quite hard again, and then put it to fix. The result was entire absence of any tendency whatever to either frill or blister.

M. JANSSEN brought before the Paris Academy of Sciences on the 16th ult. an account of the work carried on at the Meudon Observatory, with the object of perfecting solar photography and the study of the laws governing the absorption of luminous rays by the gas of the atmosphere. The photographing of the sun has made great progress, pictures being now obtained containing details from the centre to the edge of the disc, and embracing even details in the penumbra of spots. At first difficulties were presented by the immense difference of luminosity in various portions of the solar surface. M. Janssen presented proofs of negatives of a large sunspot which was visible about the middle of July last, and in it the striæ of the penumbra were seen to resolve themselves into granulations, a circumstance which enabled him to draw the conclusion that the solar surface is completely uniform.

Our always interesting contemporary *La Nature* has recently been giving its readers popular articles on various aspects of photography, the last, under the heading of *Photography and Forgery*, being an illustrated description of the various modes in which forged cheques and bank-notes, and even counterfeit coins, have been detected by the agency of the camera. Of course the principle of these processes has long been familiar to our readers, but the illustrations deserve passing notice. M. Gobert, a clever expert of the Bank of France, was able to prove conclusively before a legal tribunal the fact of an erasure and forgery in a cheque which they would have honoured, but for their suspicions having been aroused by non-receipt of advice note, and a reproduction of the particular cheque is given in *La Nature*, the printing block having been produced by photographic agency alone. An enlargement on a large scale showed conclusively the original writing had been washed away, the grain and the appearance of the paper being completely modified by the action of the chemical employed. So that the forgery should not be detected by any difference in the colour of the ink, the whole sum had been taken out and the new written in its place; but the photograph plainly showed the new figures under the old. As the writer properly points out, a similar proof might have been obtained by chemical means, but in that case the forgery would be obliterated, while in the photograph both are shown, one superimposed upon another. A similar treatment of a genuine and a counterfeit coin is also shown, but the difference is so slight as to require careful scrutiny before it can be discerned.

ANOTHER popular article consists in a description of a very old photographic trick—the photographing upon one plate the same person several times repeated in various positions. Thus we have

an artist painting, as it were, at his own portrait, while an onlooker is perceived to be a third representation of the same head. Again, we have a two-faced head surmounted by a single hat and joined to the body, also two-fronted, by an impossible and absurd neck. We need scarcely describe to our readers the method of working this very old trick, but the periodical named contains full details, and is illustrated with a drawing of the dark slide with the double sliding back. We think it is about a quarter of a century since these useless but amusing photographic toys were first invented.

PHOTOGRAPHERS are, or have been, great experimenters with varnishes, and they will, no doubt, be interested in the announcement of a new varnish possessing very remarkable properties. It has been devised for aeronautic use, but from the published description it would appear to be available for photographers also. It is the invention of M. Jovis, the Director of the Aeronautic Union of France, which has applied to the Société d'Encouragement for help to give this new industrial branch a worthy development. The varnish is stated to possess an enviable record of good qualities; in fact, the very excellent reputation given to it excites doubt. It is of great flexibility, though possessing no oleaginous base, and which, adding little to weight, confers great impermeability; it is suitable for paintings, wainscoting, &c., and will not grow mouldy; it can be exposed to great fluctuations of temperature without alteration; and, finally, the by-products of its manufacture can be utilised entirely for a variety of useful purposes. So far as we can learn, the mode of manufacture has not been divulged; but it is evident that if the above description of its properties at all tallies with actual facts, it ought to be of prime use in photographic operations.

THERE are a large number of temperature regulators—instruments for keeping water baths, cupboards, &c., at a constant temperature, but almost all are designed for use with gas as the heating agent. It is evident there must be a large number of experiments at work where gas is not available, and to them these regulators are useless. Mr. W. C. Borden, M.D., describes in the *American Monthly Microscopical Journal* a neat arrangement devised for histological purposes, but alike useful to the photographer, in which any ordinary oil or alcoholic heating agent may be used, the check action being supplied by a small electric battery. The principle of action is a mercury cup immersed in the bath, which forms an electric connection when the desired heat is exceeded, the result being a deflection of the heated air until the temperature is reduced to the required extent, being brought about by a small electro-magnet actuated at the required moment by the current brought into play by the little phial of mercury. The method seems both practical and useful.

A VISIT TO THE ORDNANCE SURVEY OFFICE, SOUTHAMPTON.

(By our Special Correspondent.)

IN giving a brief description of the work carried on at the Ordnance Survey Office, Southampton, it may be well, at the outset, to give some general information as to what is done there, and then to explain how it is accomplished. The Southampton establishment is probably the most complete of its kind in the world; the various buildings and grounds occupy a space of something like seven acres, and it gives employment to between eight and nine hundred persons. Of these about eighty are military—the Royal Engineers—the remainder being civilians. The entire establishment is under the command of Col. Sir S. W. Wilson, K.C.B., R.E., the Director-General, the different departments being under the immediate direction of other officers of the Royal Engineers, Col. Bolland, Col. White, Capt. Sankey, and others, the photographic department being under the charge of Sergeant-Major Algar, R.E. It may here be mentioned that the greater portion of the work carried out in this department is done by the military, and one cannot fail but to be impressed with the interest and pride they appear to take in their work.

The Ordnance maps, as published, are on several different scales. For example, there is a general map of Great Britain and Ireland to the scale of one inch to the mile; there are county maps six inches to

the mile; there are parish maps on the scale of $\frac{1}{25000}$, or a little over twenty-five inches to the mile; and town maps on a scale of $\frac{1}{10000}$, or a trifle over ten feet to the mile. In addition to these, which may be termed the standard scales, there are various miscellaneous maps issued. For instance, there are indexes showing the positions of the different sheets. These, also, are on different scales, such as ten miles to the inch, fifty miles to the inch, and some are forty, and some thirty. A large proportion of the maps, in addition to being published in line, are also issued with the hills shaded, others showing the contours in outline only. The work of the Survey Office is not confined to the production of maps alone, as it has issued many other publications, such as *Surveys, Photographs, and Models of Jerusalem and Mount Sinai; a Facsimile of Doomsday Book; Black-letter Prayer Book of 1636; National Manuscripts of England, Scotland, and Ireland; Anglo-Saxon Charters, &c.* Until quite recently the office had a depôt in London for the sale of the maps and the other productions, but this is now abolished, and the sole agency is at present in the hands of Mr. E. Stanford, of Charing Cross, from whom any of the maps or other publications can be obtained for a trifling sum.

Although the maps are issued on so many different scales they are all obtained from single original drawings. Towns of more than 4000 inhabitants are drawn to a scale of $\frac{1}{25000}$, commonly called the ten-foot scale. On this scale every inch represents a little over forty-one feet. Country districts are drawn to the scale of $\frac{1}{35000}$, usually termed the twenty-five-inch scale. On this scale each square inch on the map represents approximately one acre. The drawings are all made on sheets of stout paper measuring thirty-eight inches by twenty-five, and from these all the smaller scales are produced by photography and printed by zincography. On the walls of the library of the Institution are shown some gigantic maps to the various scales, built up of the sections as issued to the public, and so neatly and accurately are they joined that the junctures are quite imperceptible. The methods and appliances by which the work is accomplished will now be briefly described; first, the photographic department.

The camera in which the largest negatives are taken is a substantial building standing by itself in the grounds; in this the operators work. In one end of the building is fitted a lens, six inches or so in diameter, specially constructed for the establishment by Messrs. Ross & Co. Opposite this, on the outside, is a massive iron easel, which carries a large board, upon which the maps to be copied are fixed. The easel travels on iron rails, upon which it runs freely, and is provided with a fixing arrangement by which the utmost rigidity is secured after it is once placed in position. It is also furnished with screw adjustments, by means of which the object to be copied can be moved vertically or horizontally with the greatest nicety, without altering its parallelism. In the room, behind the lens, is fixed a firm table, on which are two Λ -shaped bars or rails, upon which travels a strongly-made frame, like the back of an ordinary camera. This frame carries the ground-glass focussing screen, and is actuated by a quick acting screw for adjusting the focus. After the focus has been obtained the screen is removed and replaced by an open frame, somewhat resembling the carrier of an ordinary dark slide; in this the plate is secured during exposure. The plates are sensitised in a horizontal bath. This is a large wooden tray lined with gutta-percha; the latter, in order to prevent its acting injuriously on the silver solution, being well coated with shellac varnish. It was mentioned that, although many other plans of making large bath vessels "silver solution proof" had been tried, none had proved so efficient as this. Here, in this camera are, of course, sinks and the usual dark room appliances. This camera is chiefly devoted to the production of the largest size negatives, and it is scarcely necessary to say that they must be, as they are, in every respect, of the most perfect description; and so excellently does the lens do its work that no difference in definition can be detected between the centre and the extreme corners of the plate. These negatives are all on plate glass, and measure somewhere about four feet by three. I may add that I was shown a large number of them, and I must say they are technically the most perfect negatives I have ever yet seen of these dimensions.

The smaller negatives are taken in the studios, of which there are two, both raised twelve feet or so from the ground. Ascending

a staircase, one enters the smaller, or old, studio, which is a handsome glass structure, well adapted to photographic purposes. Leaving this by a gallery we enter the new studio, where the greater portion of the smaller work is now done. This building, which has only been erected during the last year, is most complete in every way. It measures about forty-five feet by twenty-five, is lofty and is well ventilated. It is built on massive arches, and has an asphalted or concrete floor. So rigid is the floor, that the operators walk about during exposures without the slightest fear of causing vibration. In the floor are let in two pairs of iron rails, upon which the camera stands travel. There are two huge cameras in use here—one is fitted with a Ross lens, the counterpart of the one previously referred to, and the other with one of the rectilinear type by Dallmeyer.

One of the camera stands is of wood and the other of iron. This latter requires description. It has been constructed to the design of Sergeant-Major Algar, who, as before-mentioned, has the charge of this department, and it is one of the most perfect for its purpose yet made. Although it is most massive it can be moved backwards or forwards on its rails with the slightest pressure, and, when it is got into position a very ingenious though simple contrivance, by the action of a lever, enables the wheels upon which it travels to be put out of gear, so that the stand then rests as a dead weight upon the floor itself. As the stand weighs over half a ton, some idea may be formed of its rigidity. It has the usual adjustments of a camera stand, with the addition of one which enables the camera to be moved laterally without disturbing the parallelism. The cameras are of the usual type of copying camera, and are provided with a series of elongating cones, all of which are interchangeable. At the end of the studio, at right angles to the rails, are the copying easels. These are of iron, and furnished with screw adjustments, which enable the copying board to be moved either horizontally or vertically as may be required. The copying boards are large enough to take four of the largest size maps at a time. The sheets are secured to the boards by pins, and so neatly is this done that the junctures scarcely show at all in the negative, and, where they do, only in such a manner that they can easily be touched out. Behind the studio are the dark rooms, about which little need be said, except that for size or convenience they are in keeping with the other portions of the establishment.

One of the essential qualities of a negative for photo-zincography or photo-lithography is that the lines should be represented by clear glass while the other portions are perfectly opaque. Only those who have tried to produce negatives with these qualities know the difficulty there is in obtaining them without, at the same time, clogging up the finer details. At Southampton this is accomplished most perfectly. It may be mentioned that only the wet collodion process is employed. Here are the details: The collodion used is Rouch's (Hardwich's formula), simply iodised with potassium iodide. In winter a small proportion of bromide is sometimes added, but not as a rule. The plates are all sensitised in horizontal baths, the silver solution being of the usual strength and made slightly acid. The negatives are developed with the ordinary iron developer, and fixed in a solution of cyanide of potassium. With the exception of the use of a simply iodised collodion there is no departure from the everyday method of working wet collodion. After fixing, however, the negatives require intensification; this is done by immersing them first in a solution of bromide of copper until the image is whitened and then, after thorough washing, treating them with a solution of nitrate of silver. This treatment confers upon them great density without in any way clogging up the finest lines. Of all the methods of intensifying which have been published, none answer the requirements of the Southampton establishment so well as this. All the negatives, both large and small, are varnished with dammar varnish applied cold, hence the risk of cracking the thicker plates by heating, which would have to be done were a spirit varnish employed, is avoided. This varnish is also found the best for working upon, as it does not chip up under the etching point, which in some cases has to be used freely. The varnish is made by simply dissolving the best dammar resin in pure benzole.

It goes without saying that in copying maps, the national ones in particular, extreme accuracy to scale is of the utmost importance—an error of the sixteenth of an inch in a couple of feet would, of

course, be fatal in the finished result. As the image has to be obtained from the negative in fatty ink on paper, and it has to be transferred to the zinc while it is damp, it follows, as paper expands when it is wetted, that if the negative were made the size of the finished map it would prove too large, hence allowance has to be made for this in the copying. After every negative has been examined and passed, a print is taken from it by the platinum process. This then goes into another department, together with the original from which the negative was made, for examination, when any defects that need remedying, or alteration that may be required, are marked upon the print, to be afterwards dealt with by working upon the negative. So far as photographic defects are concerned there is never much to remedy, but sometimes considerable alterations have to be made or fresh details introduced.

(To be continued.)

ECHOES FROM THE SOCIETIES.

THE French Photographic Society must surely be at a loss for matter with which to fill up their meetings if we may judge from some of the recent reports. For instance, we are told that the Secretary announced, apparently as something worth announcing, that "a Belgian" had published as a practicable method of preventing unmounted prints curling their immersion in a mixture of alcohol, glycerine, and water. It really seems a pity to waste the alcohol and glycerine, for the water alone would answer quite as well if they were left in it until required for mounting, or they might be preserved between damp blotting-paper in waterproof portfolios, and in either case would remain as permanent as under the glycerine treatment, I should think.

Then "a great discussion" took place as to whether the practice of focussing with a large diaphragm, and substituting a smaller one when the picture is taken, is a feasible and advisable one, and it was resolved to solicit a theoretical paper on the subject. I am afraid the paper when it appears will not bring much balm to the souls of French amateurs who wish to continue the convenient practice, for cheap single lenses are mainly employed on that side of *La Manche*, and aplanatic lenses are regarded as almost unnecessary luxuries in landscape work. There must be a few aplanatic lenses in use among the members, however, since we are told "a great divergency of opinion was manifested on the subject." If the parties to the discussion each spoke from his own practical experience, no doubt the suggested theoretical paper may bring general conviction.

Next "the cabinet makers present" exhibited "some acrimony"—an euphemism, I presume, for "began quarrelling"—over the right to call a camera "*Le Polygraph*," and though the name appears from the description of the instrument to be its best feature, I scarcely think it was worth getting angry about.

This was followed by an exhibition of negatives taken in the camera upon gelatino-chloride plates, in itself a really interesting exhibit, though Professor Stebbing says he fails to see its value. It is decidedly interesting from a scientific and technical point of view, and proves that good results may be produced on such plates with exposures far shorter than many would be disposed to believe. M. Tondeur must have been quietly chaffing the workers at high pressure—those who invariably make "drop-shutter" exposures—when he said he got better results as regards detail with his five minutes exposures than if he had used gelatino-bromide with exposures of a twentieth of a second. If the "high pressure" men could only take it to heart!

The last and "most interesting subject of the evening," a "new and novel" photo-engraving process, casts a curious old-time shade over the members of the Society who invested it with its interest and the inventor (?) who patented it. I have a full description of the process so far as the production of the engraved plate is concerned, as well as of the machine by which it is engraved, in an account of the exhibits in the 1851 Exhibition. When photo relief blocks first came into use, their application to the process was perhaps a patentable one, and I believe Woodbury did take out a patent. But now I cannot see what there is to patent, or to excite the special interest of the premier Photographic Society of France. I have not seen the

specimens forwarded to the Editors, but perhaps it may be something superlative.

Many landscape photographers will be grateful to Messrs. Spurge and Cowan for their suggestions as to the use of a biconcave lens as a view finder. This is about the simplest and most efficient contrivance for the purpose that I have yet seen mentioned, and at a very small cost might be made to suit any lens and any size of plate if used as a view meter, while for merely locating objects on the plate, without using the focussing screen, it stands unrivalled for simplicity. M. Chevallier's practical rendering of the same idea reported from Paris is very convenient and portable. It consists of a parallelogram of glass with one of its surfaces ground concave, making it a plano-concave lens that will stand on edge on the camera without trouble, and may be carried in the waistcoat pocket without the slightest inconvenience. It is to be hoped something of the sort will be introduced here before long.

Speaking of "finders" leads me to ask the question how they are to be used with some of the ridiculous cameras that have been recently introduced into the market. With an instrument fixed under the waistcoat or in the coat-tail pocket, I fail entirely to see the use of a finder, or even if it could be used, I should like to know how the camera is to be made to answer the will of the operator. Yet the Chinese used to be said to make tolerably fair practice with their matchlocks when fired from the hip.

But the members of the Birkenhead Society have discovered still another difficulty with one of these waistcoat cameras, namely, how a correct level is to be obtained, so as to secure perpendicular lines, when the instrument is used by an operator "with abnormal corporation!" It seems to me that the operator who is clever enough to select and "locate" a picture with such an instrument is not one to be mastered by trifles, and, "corporation" notwithstanding, I would back him to produce lines at any rate straighter than his own.

Theatrical interiors appear to be getting quite the fashion since Messrs. Hyslop and Roberts set the ball rolling once again—for they were not the first by many years to produce such pictures. But why should "an imitation of a Turkish street scene" be selected from among its fellows as "most natural?" Has the term "natural" any reference to the character of the illumination—or want of illumination—of the bazaars and slums of Eastern cities? If so, the criticism is not complimentary to the pictures, as a whole, exhibited at Birkenhead.

After all, publication in the photographic journals does not seem to be of much value, or at any rate it is not esteemed so by those who read papers and those who report them. I can forgive the reader for repeating a formula *vis à voce* to his hearers, but I am not so inclined to be lenient to the reporter who occupies several lines of "displayed" type in repeating it, and gives me the trouble of re-reading it in his account of the meeting. Mr. Wollaston, at the Convention, gave a developing formula singularly resembling the American Standard I referred to last week, and it was duly given to the public in THE BRITISH JOURNAL OF PHOTOGRAPHY the following week. If the JOURNAL is any good at all, where then is the need to repeat it weekly in the same columns, as has been the case for at least the last fortnight? I shall wait until next week for a reply; meanwhile, if any secretary has republished it I hope he will be able to give a good reason for so doing.

MONITOR.

IMPROVING FEEBLE NEGATIVES.*

BEFORE exposing the plate, I have already mentioned that it must be made perfectly dry and warm, and in that condition placed in the printing frame, the sensitive surface being duly protected from mechanical injury, as well as damp, during the period of exposure. In order to learn development it will be as well to practise the reproduction of a negative instead of merely the improvement, as this will give a better idea of the capabilities of the process and better permit the progress of the formation of the image to be watched. We will, therefore, suppose a clean glass plate to have been coated with the sensitive mixture, dried, and, together with a negative, to have been placed warm in the printing frame and exposed.

Upon taking the plate from the frame, if the exposure has been short, it may probably still retain some of the warmth, in which case

* Continued from page 531.

the development or dusting process may be at once proceeded with. If perfectly cold, it is imperative; and, in any case, it is safer, before commencing, to again gently warm the plate, in order to ensure its being perfectly dry, as, if it should have absorbed any considerable amount of moisture, the first touch of the brush may produce a mark which will be afterwards indelible, especially if it happen to fall on any of the protected parts of the film. It is well, also, to heat a small quantity of the powder to be employed, in order to ensure that that also is perfectly dry.

The light to be used should be orange or yellow, and plenty of it; the so-called "canary medium" or "golden fabric" will either give a suitable illumination, the translucent surface forming a good background against which to examine the progress of the development. A sheet of clean white paper should be spread upon the table to serve the double purpose of catching the powder dusted off the plate and also to reflect the light through the negative while in a horizontal position. The brush must be a soft one of camel-hair or similar material, of moderate size, so as to hold a fair quantity of powder, and enable it to be spread quickly over the plate. I formerly used a flat brush about an inch in width, but now prefer a round dusting brush fixed in a quill about the thickness of a lead pencil; such may be obtained for about a shilling. A smaller brush may be kept handy for local treatment.

All the necessary arrangements being made, the warm plate or negative is taken in the hand or on a pneumatic holder, and the brush, having been dipped into the powder, is passed rapidly over the surface, backwards and forwards, along and across. A good supply of powder may be applied to the surface, but kept in motion, and never allowed to rest long in one place. At first no apparent effect will be produced, but, as the plate cools, the surface will begin to present slightly dull patches as the powder commences to adhere; and if, after a minute or two, the superfluous colour be dusted off, a faint picture will be visible by reflected light, though probably not when the plate is looked at by transmission.

If the exposure has been correct and the sensitive mixture is in proper condition—that is, contains the proper amount of hygroscopic matter for the state of the atmosphere—all that will be requisite will be to continue the dusting process until the desired degree of density has been attained, always observing that the powder is kept in constant motion and that the brush is kept working pretty evenly over the whole surface of the plate. But it is seldom that the prevailing circumstances are altogether favourable; it is no easier to accurately hit the proper exposure in this than in other processes, but, fortunately, as in others, the development affords a good deal of latitude. The following general hints will give the learner an idea how to proceed in case of any hitch in the proceedings:—

If after some time, say three or four minutes, of diligent dusting no image is formed, or only that visible by reflected light, either the exposure has been very much too long or else the sensitive solution is deficient in hygroscopic matter and the atmosphere is too dry to supply it with the necessary moisture. In such a case the best plan is to lay the plate on one side for a few minutes, first dusting off very carefully all the superfluous powder from the surface. This is important, as, should the film become suddenly tacky, as is very often the case, the powder would become attached, and not only give a spotty appearance, but form a number of nuclei, around which further quantities would settle on resuming the dusting.

After a few minutes' rest the film will, in all probability, have acquired sufficient tackiness to allow development to proceed, but before again applying the brush it is necessary to see that it has not become too moist. First, try the edge of the plate with the finger; if a decided impression is left the plate is too moist and must be redried before proceeding any further. Upon the resumption of the dusting it will in all likelihood be found that the film is not so slow in absorbing moisture as at the outset. If the film take no decided impression from the finger, it may be tested further by passing the brush, lightly charged with powder, round the edges, when, if no tendency be shown to violently attract the powder in patches, it may be passed lightly and rapidly over the whole surface, and the former course of procedure resumed until there is again a stoppage of the action, when a further rest must be given.

It is the custom with some operators under such circumstances as these to breathe or blow upon the plate in order to supply it with the requisite moisture, but this is a practice I do not recommend, except in very refractory cases, as the action set up is so apt to be irregular and the powder laid on in dense patches. In bad cases of this sort—that is, when the atmosphere is very dry and the sensitive surface deficient in hygroscopic matter—the best plan is to create an artificially moist atmosphere by shutting up the plate in a box or drawer in proximity to a wet sponge or some damp blotting-paper; this will at least promote uniformity of action.

If, on the other hand, the powder commences to attach itself rapidly to the plate, and in a coarse, smeary, and irregular manner, showing the marks of the brush, it is evidence of under exposure, or, what is more probable, excess of hygroscopic material and the presence of too much moisture in the atmosphere. This is a more difficult state of things to cope with than the previously mentioned, and the result rarely justifies the trouble taken; it is better to begin afresh with a new exposure, and, if need be, with a modified solution. All that can be done is to keep the plate as dry as possible by repeatedly re-warming it, but, as may be readily imagined, the game is scarcely worth the candle.

I do not wish to infer that slight cases of under exposure cannot be successfully met in this manner, because, by carefully re-warming, combined with a judicious local use of the brush, they undoubtedly can; and in occasional circumstances, which will suggest themselves as experience is gained in working the process, the method of repeatedly redrying an under-exposed or over-hygroscopic film will prove of great use. It is advisable to have at hand always, when developing, the hot plate described in my last article.

A word or two may be said on the subject of the sensitive solution, and its preservation in a condition suited to the prevailing conditions of the atmosphere. This is a sufficiently easy matter when the process is in constant use from day to day, but not so when it is only taken up occasionally and perhaps at rare intervals. When it is in regular use a simple hygrometer suffices to indicate from day to day the changes, if any, that have taken place, and the modification necessary or advisable in the working solution. But it is impossible to fix any definite proportions of the different materials to suit any particular atmospheric conditions, even if it is feasible to accurately estimate the latter at short notice; hence the amateur must trust very much to experiment. It need not prove a very difficult matter, however, to get the solution into working order if the formula I have given be taken as the starting point. That will suit what I may term normal conditions, and any departure therefrom can readily be discovered by the behaviour of the plate under development.

In preparing the solution, it is, perhaps, the best plan to make use of separate solutions of known strength of albumen, honey, and bichromate, each carefully filtered, mixing them in due proportions when required for use. The mixture does not keep in good condition for many days, hence the advisability of mixing only so much at once as may be required. If on the first trial it should prove to require modification, it is easily effected by the addition of more of one or other of the separate solutions, bearing in mind that the honey is the hygroscopic element.

It is scarcely possible to give any more detailed instructions on the subject of development beyond what I have already said. One or two actual experiments in the process will make perfectly clear the distinction between under and over exposure, and all that then remains for the novice is to always observe a few very simple rules. Always have the solution carefully filtered and the plate perfectly clean and well dusted. Always put the plate warm into the printing frame. Always warm the plate before commencing to develop. Always test the plate as to its hygroscopic condition before reapplying the brush after it has been laid aside. And, lastly, always have everything perfectly dry. If these simple rules be observed the rest will be comparatively easy.

And now turning briefly to the treatment of negatives, the chief value of the process is the facility it affords, when the development is mastered, of local treatment, or the treatment of portions only of a negative. It enables this to be performed in a far more efficient manner than by any system of masking, as the dusting operation places in the hands of the operator a power of "vignetting" one part

into another that he does not otherwise possess. Indeed, I have seen used, and have used myself, the bichromated albumen mixture without any exposure to light, simply as a basis upon which to apply powdered colour for purposes of local treatment and masking, and I am not sure that this application of it alone is not worth serious cultivation.

There is one "dodge" that I have found particularly useful in working on the back of the negative when it is desired to magnify contrast. Give a very short exposure *through* the negative, and develop until there is a fair deposit chiefly on the *lights* of the negative. Now redry and again expose for a *very* short time, but this time let the bichromated side of the plate have the exposure. In this manner the *surface* of the unprotected parts becomes hardened, while the deposit already formed on the protected portions retains for them their power of still taking on more powder, and so gaining density. This may be repeated more than once, but it is clear that each individual exposure must be excessively brief—not more than a few seconds.

To finish off the plate when the required effect is gained, let it be once more heated, and then placed in the sun or daylight for some time to thoroughly harden the film. It is then coated with collodion, and afterwards washed until the colour of the bichromate is removed, a very dilute solution of sulphuric acid aiding materially towards that end. It is in view of this washing operation that I advise that the gelatine negative film be not varnished, as it will then better stand the washing. There is no need to varnish the dusted image, as it is exceedingly hard when collodionised.

Should it be desired to remove the image produced in this manner it may be done with a mixture of sulphuric acid and water, one to five, or, if that be not at hand, a *cold chisel*. H. Y. E. COTESWORTH.

WRITING AND DRAWING ON GLASS.

I.

HAVING made a few experiments recently with the object of finding out the best method of producing sketches and handwriting upon glass with pen, lead-pencil, or brush, I propose to narrate the results obtained. The subject is naturally one of interest to photographers, who constantly have to do work of this kind, chiefly in connection with the improvement of negatives. Etching on glass is sometimes necessary, not with hydrofluoric acid, but by coating a glass with an opaque film, and scratching through this with a needle, so as to produce a negative of a line subject, from which positive duplicates can be produced by any printing process. I propose also to describe a novel method of converting a line drawing upon glass into a negative having perfectly clear glass in the lines, and any strength up to opacity in the ground. The same system is also available for producing transparent coloured drawings upon a shaded or opaque ground.

Writing with Ordinary Ink.—When writing on glass is wanted by a lecturer, as a slide for the lantern, the readiest method of doing it would be to use the usual pen and writing-ink on a small piece of clear glass. It is possible to write thus, but the results are extremely imperfect. The ink spreads on the glass so that fine lines cannot be produced at all; if the glass is greasy the ink refuses to take to it, except in blots; and, lastly, the writing is very faint, through the ink not being sufficiently opaque. In order to enable the ink to take more readily to the glass, it has been recommended that the tongue should be applied to the surface, so as to moisten it; when this moisture dries the glass is apparently clean, and writing upon this surface, it is said, can be done with facility with ordinary ink. The method may command admiration on account of its simplicity and readiness, as most people have a tongue at their disposal, otherwise it has few virtues; there is a slight improvement over the first method, and that is all that can be said in its favour. A little ox-gall rubbed on the plate has a similar effect. Gum is frequently added to writing-ink to prevent it spreading upon paper, the amount is small, and is not sufficient to prevent spreading when the ink is applied to glass; hence the addition of a little more gum arabic (or, what is better, white sugar) to the ink causes an improvement in this respect. If a cloth is moistened with the gum solution, and the glass is rubbed with the cloth so as to leave a thin film of gum on the surface, and this film is allowed to dry, the writing will become easier, and it will

be possible to produce fine lines. If, instead of the gum, we employ a film of gelatine, we have again an improvement, and our writing on glass for the first time becomes easy. The gelatine should be dissolved in warm water, in such proportions as to form a thin jelly when cold; the glass having been warmed, the solution may be applied with a brush—the film will dry in a few minutes. A hard gelatine is the best for this purpose, such as Coignet's Gold Label. A soft gelatine is apt to tear up and absorb the moisture from the ink too quickly. The writing produced in this way is not very dark in the lines. The ink that is employed may appear black enough on paper, but on glass, owing to the light only passing *once* through the ink, it proves weak. When the writing is on paper, the light passes through the ink to the surface of the white paper, which reflects it back again through the ink, thus producing by a double passage a greater depth of colour.

The Powder Process.—There is a simple method of producing opaque lines on clear glass, but it is not suitable for very fine work. A glass plate is carefully cleaned from every trace of grease or gum, and is then polished with French chalk. A thin syrup is made by dissolving white sugar in water; if cold water is saturated with the sugar it will be of the right strength. This is used as ink in a pen, by which the writing is done; when the latter is dry it will be nearly invisible. We can now select a fine dry powder of any sort or colour, and dust it over the writing with a soft camel-hair brush. If the sugar is perfectly dry none of the powder will adhere; but if the writing is breathed upon, so as to soften the dried syrup, it will retain the pigment, and the writing will stand out clear and distinct. Powdered plumbago and lampblack may be used for black lines; other colours in powder, such as burnt sienna, gamboge, Prussian blue, &c., will impart colour, but not a transparent colour; while gold, silver, and bronze lines may be produced by dusting over with the various bronze powders sold by druggists. With care, very fine lines may be produced by this system, but they are apt to be obliterated through the softened syrup being carried away by the powder during the act of dusting. If the sugar becomes too much softened by the breath the lines will become blurred; however, the process is very useful and practicable for many purposes. Designs may be cheaply produced in quantity in this way with the aid of indiarubber stamping blocks, such as are used with aniline inks on paper. If such a block is pressed on a pad containing syrup, and then on a clean glass, the design will be transferred in invisible form to the latter, and will instantly start into clearness and vigour when the powder is applied. When the syrup becomes dry, the powder adherent to it will be firmly held, and will withstand a moderate amount of friction. If exposed to damp, however, the writing will be apt to rub off. This may be prevented by applying a protective film to the glass after the writing is completed—this film may be either plain collodion poured over the glass, or mastic varnish put on with a brush, or negative shellac varnish applied in the usual way to the previously heated plate. If the syrup is replaced by a sticky substance insoluble in water, such as jappanners' gold size, or Canada balsam thinned with turpentine, the design, when dry, would be quite unaffected by damp, and would not require any protection on this account.

For fine writing or sketching on glass with a pen, the syrup is the best medium, as it flows easily from the nib. In order to render the writing visible during its production, and before the application of the powder, a little aniline blue or black may be dissolved in the water before adding the sugar, or the syrup may be made by dissolving sugar in common writing-ink.

The same process may be employed on any smooth surface—card mounts, for instance. A photographer can easily put his name or autograph in gold letters on any mount by having a rubber stamp made with the desired inscription, or he can write with a pen dipped in a limpid solution of Canada balsam in turpentine. The writing will be faint at first, but on applying a gold bronze or coloured powder, which will only adhere to the writing, it will become very distinct, and, when dry, will bear handling. This method gives much better results than writing with the gold ink made by mixing bronze powder with syrup or a thin varnish.

The best result of all is obtained by using gold leaf, which is pressed upon the writing as soon as it is set, and then left for some hours to allow the varnish or "ink" to get thoroughly dry. The superfluous gold leaf is then wiped off with a cloth.

A Collodion Film, when dry, is very easy to write upon with a pen and to paint on in water colours. The ordinary enamel or plain collodion may be used, and will be found to give a surface perfectly free from grease, so that the ink will take to it readily. It is not, however, fit for lead-pencil work.

Gum Dammar, dissolved in turpentine or benzole, gives one of the best surfaces for writing upon with a pen, and it has the additional advantage of being available for the lead-pencil. I believe that this gum is more largely employed than any other by retouchers, as a medium for enabling them to work upon gelatine negatives. Care should be employed in the selection of the solvent; some turpentine leaves traces of grease, and this makes the film useless. The rectified turpentine should be employed, or, what is better, the dammar gum may be dissolved in a little benzine, which is then thinned with ether to the proper consistency. This medium flows as easily on glass as collodion, it gives an even film, and it has the advantage of drying quickly, so as to be available for work in a short time. The drier the gum is the better does it take the lead. A little indiarubber solution is added by some to give elasticity to the film; practically the gum dammar alone answers very well.

ALBERT WM. SCOTT.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

THERE is nothing more essential to an artist's securing comfort in his working and completeness in his effects as his *materials*. Above all things they should be good, indeed, the best procurable; they will soon and effectively repay all the extra outlay entailed. I think it is only justice to mention the name of Mr. James Newman when on the subject of materials. He has devoted years of study in order to produce various *spécialités* to aid the artist in his efforts to colour photographs. Among such I may name his "*Diamond*" *Enamel Paste*, which imparts not only a beautiful finish to either plain or coloured photographs, but also a depth and brilliancy, combined with a certain degree of protection against the evil effects of exposure to the atmosphere. It also gives to the photograph a bright surface which hides all offensive touches or markings which would be too prominently observable without its application.

Another of his *spécialités* is his "*Sizing Preparation*," which will be found very useful in many ways. It is most efficacious as a preparation to render the surface of the photograph suitable for working upon. In its natural state it is rather difficult to float colour evenly over the surface of a photograph, and there is usually a necessity for some means or other to give it such a quality as will allow of an even wash of colour being passed over it. For this purpose, therefore, I can recommend this "*Sizing Preparation*." There is a somewhat similar "*size*" for use on absorbent papers, and, if needs be, will produce a surface where same may be injured by over work or the too frequent application of the sponge. The colours, by being slightly mixed with this preparation, will have a great tendency to become fixed, and can be worked over with very little risk of being disturbed, and can be even varnished. I may as well say that my remarks are almost exclusively intended to treat on water colour, although a few may be equally applicable to oil colour as well.

A wash passed over a carbon print will not only make it easy to work upon, but, without giving it a gloss, will add a general brilliancy to it, as well as impart a general delicacy of tone. In fact, these preparations are very useful, and in some cases almost indispensable.

Brushes! Ah! what trouble sometimes to get good ones. The artist should always keep a sufficient quantity by him, and they should be the best. He must have some fine pointed sables for stippling and working out the finer details, and larger ones for working in the washes and broader portions of his picture. There is no rule which can be laid down for the selection of brushes; every one should select those with which he can work with the maximum of comfort, but they should always be the best as to quality. It is quite a matter of taste whether they are mounted in quill or metal. Personally I use the latter, as they stand wear and tear somewhat better.

For very many years (I do not care to say *how* many) I have been in the habit of using Winsor & Newton's brushes, and have invari-

* Continued from page 537.

ably found them really good. Their price is not the lowest, but they don't profess to be *cheap* rather than supply the best article. All sensible men who think a little must know that a really good article is worth a fair price. I have known them rise their prices, and when I inquired how it was they very kindly explained that it was owing to the difficulty in procuring the sable with sufficient *spring* to enable them to provide a first-rate brush. One need never grumble at the price varying a little, but it would be another matter if the *quality* varied. This, I must say, I have never found; their brushes are always well selected, and if they sell you a brush and say it is first-class you can rely upon it. At least, such has been my experience.

I do not wish to infer by this that a *cheap brush* by other makers may not be good, but I do say that such brushes are not dependable. One may be really a good brush, but the next half dozen may be unfit for producing good work.

We should be provided with a china palette, a few saucers, and one or two slanting tiles. When large washes are required it would be impossible to get enough colour mixed upon a palette, and in such cases the saucers or slanting tiles will be invaluable. Indiarubber, ink-eraser, sharp knife, scraper (this instrument may be procured at any colour shop). Some painters use a lancet, while others use a needle. We must also have some very finely powdered pumice-stone, a bottle of gum-arabic water, not too thin, as it can easily be diluted by the addition of a little water. An agate burnisher and drawing pins will almost complete the list of your wants. Of course, if you are engaged on large work I would recommend the use of a *mahl stick*, as its use gives considerable freedom to the hand.

If, again, you paint, in general, large work, an easel will be necessary, and for general work and usefulness a "Corbould" is undoubtedly the most desirable. But any easel, if sufficiently firm, will answer the purpose quite well enough. For the smaller work, however, an easel will be somewhat awkward, although one can get into the habit of working at one to such an extent that they will prefer painting even the smaller work upon it, pinned to a drawing board. I think a desk suitably placed upon a table will be found more convenient, notwithstanding, for the smaller work. I may here mention that a small pot of prepared ox-gall will be found very useful at times. It is not necessary to use it on ivory, but it is often almost indispensable for paper that appears somewhat greasy. The less, however, used of it the better, as too much will have a ruinous effect upon the photograph or paper. Any subject which seems to require it should have a weak solution of it washed gently and quickly over the entire surface with a camel-hair pencil. Camel-hair pencils are no use for painting generally, as they have not sufficient *spring* to give a reliable *touch*. Some prefer red sables to all others on account of their greater stiffness, although the brushes made of black sable invariably have better points. The small sables used for stippling should not be too small, as working with such would lead to an excess of finish or rather fineness of stippling, which would materially injure the higher objects of art, viz., depth, solidity, and colour.

We now come to the most important part of all—the colours. As in the case of the brushes, I have ever given the preference to the colours produced by Winsor & Newton. I have never found them vary, and have always found them easy and agreeable to work with. I mostly use moist colours, and have always found those supplied to me by Winsor & Newton, although they retain their moisture in the box, dry consistently and in convenient time when applied to the picture. These are both qualities which recommend themselves to the artist using them, and I feel sure any adopting their use will derive complete satisfaction therefrom.

I will give a list of colours used in miniature painting, with a few words as to their properties and uses, and supplement them with such others as would allow of every class of colouring being carried out.

Carmine.—A brilliant crimson, possessing great power in its fuller touches, its paler washes being possessed of considerable clearness, though not quite equalling rose or pink madder in this latter quality. It is easy to work, but is somewhat fugitive.

Pink Madder.—A most delicate carnation, much used on account of its superior permanency. It is much clearer than either crimson, lake, or carmine in its lighter tints, but is not possessed of density.

Rose Madder is similar to pink madder, and is possessed of a little more depth.

Crimson Lake possesses much of the characteristics of carmine, but lacks its extreme richness and brilliancy. A most useful colour for mixing in various tints for draperies, &c.

Venetian Red.—A most beautiful as well as permanent colour. A beautiful colour for flesh. Its tints, if not bright, are always clear, and in combination with cobalt or French blue will produce fine pearly greys. It works better than light red, and is a better and more delicate tint.

Light Red.—A clear and transparent red, low in tone, more of an orange tint than Venetian red, but otherwise similar in character. Makes a good ground for flesh.

Indian Red.—A powerful red of a purplish hue. It is an excellent colour for the shadows of the flesh either alone or in combination with blue.

Vermilion.—Rather a heavy colour, and very little adapted for use in flesh tints. It does not flow well, and is not transparent, hence it is not so generally used as it otherwise would be.

Scarlet Vermilion.—More scarlet in tint than above, and washes much better.

Orange Vermilion.—Rather more transparent than the others, with a clear but not bright orange hue. Washes moderately well. Some miniature painters hold it in great esteem.

Chrome Yellow is an opaque or body colour. Very necessary for some effects, such as bringing out gold, &c. There are three tints of this colour—pale, deep, and orange. For miniature painting the lightest tint will be of sufficient depth.

Indian Yellow.—A beautiful intense yellow. It works well and is permanent. Mixed more or less with Venetian red can be used for a flesh. Is also very serviceable for draperies, &c.

Roman Ochre.—Used for dark flesh colour and also draperies. For these purposes is much preferable to yellow ochre.

Gamboge.—A pale and somewhat greenish yellow, sometimes used in draperies.

Cadmium Yellow.—A nearly transparent colour. Best vehicle for procuring an orange tone. A most brilliant and powerful yellow.

Ultramarine.—Permanent, but does not work well, except in large masses of drapery. It is one of the most permanent colours we have, and is most pure in tint. It is not so well adapted for mixing with other colours as the other blues, owing to its gritty quality.

Ultramarine Ash is not so positive in tint as ultramarine, but washes better; it is sometimes used in flesh.

Cobalt.—Most useful in every respect, sufficiently bright, permanent, and washes well. Cobalt in conjunction with pink madder and raw sienna will form a flesh.

French Blue.—Darker than cobalt and of great intensity, is permanent, and resembles the tint of real ultramarine. Although not so pure or vivid, generally it is more useful, for it washes and works well.

Indigo.—Useful for dark compound tints.

Prussian Blue.—Used in miniature draperies, useful to portray blue velvets, and when mixed with carmine all the varieties of purple, violet, and marone velvets can be obtained. REDMOND BARRETT.

(To be continued.)

ON THE FADING OF SILVER PHOTOGRAPHS.

I.

NOTWITHSTANDING the large amount of information which, from time to time, has been published respecting the permanence of auriferous photographs, there still remains much to be learnt before we can arrive at a precise knowledge of the *whole* of the causes which combine to change and ultimately destroy them. And even were these causes fully understood, it is obvious that some of them are not under our control, whilst others, by proper care in selecting and compounding the necessary materials and in conducting the various manipulations, can be easily avoided.

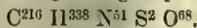
It is hardly necessary at the present day to enlarge on the decay-inducing causes which are under our own control. These may be briefly summed up in the use of impure materials, imperfect elimination of hyposulphite, impure mounts, easily decomposed mountants, and, lastly, the storing of such prints in positions where impure air has access so them. It may be stated generally that sulphur and

some of its compounds are the most common and, at the same time, the most potent agents in the destruction of silver photographs. Now these may be communicated to them in several ways. First, from a decomposition of the hypo in which they are fixed; second, from an imperfect removal of the fixing agent by thorough washing; third, from the action of sulphurous fumes derived from the air of the place in which they are stored; and, lastly, from some of the antichlor-hyposulphite of soda not having been eliminated from the paper composing the mounting cardboard.

When Herschel discovered and first described hyposulphite of soda (in the year 1825, I think), he particularly called attention to the fact of its forming an easily decomposed double salt with silver compounds—the chloride for instance. Under such circumstances, if we dissolve two equivalents of silver chloride in one of hyposulphite of soda, we obtain two equivalents of chloride of sodium and one of hyposulphite of silver, thus:—

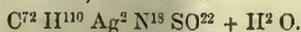


Now this latter compound (hyposulphite of silver) is most easily decomposed, either by very gentle heat or by even the weakest acids. The consequence is that sulphurous fumes are set free to react on the photographic image and eventually destroy it. For this reason it is important that fresh solutions of hypo should be used for fixing each batch of prints, and, further, that this solution should be neutral or preferably slightly alkaline. Further, to avoid risk of decomposition, every trace of silver nitrate should be eliminated from the prints before they are fixed, inasmuch as the addition of this salt, even in minute quantity, to hypo solution is almost certain to liberate sulphurous acid, which will, of course, react prejudicially on the silver image. But this acid, although it ranks in the list of bleaching agents, if its action be long continued, seems to exercise, also, a deteriorating influence on the paper itself; but whether this be due to its original composition or to some chemical change effected by the silver nitrate, is a question worthy of full investigation. Be this as it may, the fact remains that even the most carefully executed silver print, on plain paper, has its high lights dimmed by the action of this gas. When albumenised paper is the supporting medium, the yellowing effect of the gas is much more decidedly marked, more especially when the air is moist. But this might be expected when we bear in mind the fact that albumen itself contains sulphur, although this quantity varies considerably according to the source from which it is derived. Indeed, albumen is a very complex compound, its composition, according to Liebig, being represented by the following chemical formula:—



Mulder and Lieber-Kühn give slightly different formulæ, but all agree in about two per cent. of sulphur.

With albumen, silver forms a compound called albuminate of silver, having, according to Watts, the formula:—



If any one tries the experiment of subjecting to hydrosulphuric acid fresh albumen coagulated by heat and albumen precipitated by silver nitrate, the latter being fixed in hypo and then thoroughly washed, he will find a considerable difference in the effect produced. The plain albumen, so acted on, will remain perfectly white long after the silvered portion of the same albumen has become quite a dingy yellow. To my mind this proves that hyposulphite solution does not altogether remove the silver from the albuminate of that metal, even although the compound has not been subjected to luminous influence so as to suffer reduction. If these experiments of mine with albumen be confirmed, the question would arise whether it would be judicious to continue the use of albumenised paper for silver printing, seeing that such photographs are more liable to decay than when made on specially-prepared plain paper. If we substitute gelatine for albumen we may only be walking out of the frying-pan into the fire; for it also contains sulphur in its composition, but whether in a form wherein it is affected by silver nitrate I have not yet ascertained.

GEORGE DAWSON, M.A., PH.D.

THE FIRST INTERNATIONAL PHOTOGRAPHIC EXHIBITION IN ITALY.

THE International Photographic Exhibition in the fair city of Florence is now open; it is of special interest because it is the first one of an international character which has been held in Italy, and it has resulted already in the founding of the first Italian photographic society. The lack of organization among Italian photographers was one difficulty in the way of holding an exhibition, since it threw much extra work upon the promoters in the way

of bringing their own photographic countrymen together; another impediment was the fact that some of the Italian photographers are saving the best specimens of their work for the Paris Exhibition of 1889.

The Exhibition was opened by the King and Queen of Italy, who were conducted by the president of the managers, Commander Nobili, over the galleries, some of which, thanks to the climate, are in the gardens of a hospital, and some in salons. All the exhibits of Italian amateur photographers, and of persons residing outside Italy, are in special salons.

From M. Léon Vidal's report in *Le Moniteur de la Photographie*, and from a report by Dr. Gioppi in the *Journal de l'Industrie Photographique*, we learn that neither money nor work has been spared to make the Exhibition attractive and interesting, and that the exhibits number 350. In exhibits from outside Italy, France and Germany take the lead. The United States has but one representative among the exhibitors; M. Carlos Relvas sends a fine collection of pictures from Portugal; the Topographic Institute of the Low Countries has sent a very interesting series of exhibits. One of the great features of the Exhibition is the collection sent by M. Nadar, of Paris, which fills the whole of one salon, and is fitted up with perfect taste. It includes varieties of apparatus, also some portraits nearly three yards long upon Eastman paper, and of magnificent execution; there are also several good portraits of Chevreul in various positions, and some interesting photographs of Underground Paris; also a long series of portraits of French celebrities.

From England the Woodburytype Company has sent specimens of its work. Mr. A. Cowan has forwarded some of his gelatino-chloride lantern slides, which occasionally have been projected upon the screen, and were much admired. Some marine views have been contributed by Auty, of Tynemouth, and by West & Son, of Southsea; the former also exhibits two fine prints of a flash of lightning. Messrs. Marion and the Eastman Company exhibit their products. The phototypes of M. Bruckmann are stated to be marvels of good work; M. Bette, of Berlin, is an exhibitor; M. Schuster, of Berlin, exhibits photo-engravings; Dr. Just, of Vienna, bromide enlargements; Dr. Donadieu, of Lyons, furniture, interiors, and decorative designs; and M. Tissandier, photographic proofs turned out in the ordinary printing press. Dr. P. Richter and M. Londe exhibit photographs taken at the Salpêtrière of the features of certain diseases; Thury and Amey their celebrated shutter; Anschütz, of Lissa, instantaneous pictures of horses at full gallop; Pietsch, of Switzerland, and Debas, of Madrid, landscapes; and De Meyer, of Kief, Russia, some good transparencies. There are exhibits from Constantinople and Barcelona. M. Reutlinger sends some fine specimens of artistic photography to aid painters; the subjects are children, young women, and so on. Among the French expositors of apparatus and materials are M. Darlot, M. Mackenstein, the Paris Central Society of Chemical Products, and M. Tailfer. Voigtländer exhibits lenses; Bussler, of Berlin, elegant columns and statues in *papier mâché* for studios; and M. Français, his last novelty, the '*kinégraphie*.' M. Boissonas, of Lyons, and M. Beernaert, also Mrs. Van Monckhoven, send specimens of their dry plates. Dr. Liesegang exhibits panoramic apparatus for tourists.

The literature of photography is represented by its newspapers and periodicals, and by the numerous works on photography issued by French and German publishers.

Among Italian exhibitors Giardelli, of Florence, sends phototypes; Paganori, photo-engravings; Turati, of Milan, some important prints from type-high blocks, produced by a patented process; Lamperti and Garbagnati, of Milan, tourist and other cameras; Brogi, magnificent photographs on glass; Pallavinci and Sobacehi, of Lodi, portraits cut by the sand-blast; Garofali, Martorelli, and Mosconi, of Milan, apparatus and cards; Colombo, of Milan, and Cappelletti, of Florence, cameras; well-made burnishers and rolling presses by Casalegno, of Turin; a student's microscopic camera by Corsi, of Florence, engineer; ceramic photographs by Bucciolini, of Florence; porcelain vessels by Ginori; dishes, bottles, and measures, by Alman, of Turin; popular Italian dry plates by Dringoli, of Empoli. Capelli, of Milan, and Melazzo, of Naples, exhibit their dry plates; Ghezzi, crystallographic prints; Bardelli, of Turin, compact apparatus for Alpine explorers; and Muffone, pocket apparatus. A *salon* is reserved for portraits by Alinari, Alvino, and other Florentine photographers. Among Italian exhibitors are also Brogdi, Rossi, Montabone, and Bettini; the firm of Trèves Brothers exhibits good specimens of photo-mechanical printing, type-high; and the Military Geographical Institute of Florence exhibits work which deserves special study. M. Léon Vidal mentions various Italian commercial firms which do good work in photo-mechanical printing, but adds that it is not equal in quality to that of the best German houses, such as Bruckman, of Munich, Rommel, of Dresden, and Rumler & Jonas, of Leipzig. He

adds that photo-engraving in half tone is but little practised in Italy, and that at the Exhibition the best work of this kind is the magnificent exhibit of the Photographic Society of Berlin. Ceramic photography is little worked in Italy, and, so far as he could see, not upon an industrial scale. The aristotype pictures on view are of good quality; several platinum prints are on view—notably, the artistic specimens by M. Debas. There are very few carbon prints in the Exhibition.

Among the most active members of the Executive Committee are the President, Commander Nobili, Count Bastogi, and Signor Carlo Brogi. At a banquet, after the labours of the jury had been completed, the President said that the Exhibition ought to be the occasion of the foundation of an Italian Photographic Society, and all the persons present at the banquet signed their names as its first members. Count Bastogi was nominated President of the Society, and M. Paul Nadar and M. Léon Vidal corresponding members.

At present it is too hot for Italy, but Florence being a hill town, the heat there is not so fervent. Later in the season this Exhibition should be much visited by English tourists, despite the numerous other exhibitions and attractions in the city.

The mysterious statement about some of the photographs being placed in gardens, no doubt refers to gardens surrounded by colonnades or cloisters, which are common in connection with large Italian buildings, to give protection from the fierce rays of the summer's sun. For the same reason the streets in Italian towns are commonly narrow, or when broad are frequently provided with colonnades. English visitors do not always avail themselves of the protection, perhaps from force of habit, hence the Italian saying:—"Dogs and Englishmen walk in the sun."

A SEARCH FOR A SUBSTITUTE FOR HYPO.*

HAVING tried these experiments upon silver bromide, it was natural that the iodide also should receive some attention. Using the same quantity of silver solution, but precipitating it with potassium iodide in the same careful manner to avoid an excess of the alkaline haloid, washing and draining, there was obtained for each experiment 0.5725 gramme (8.835 grains) of silver iodide. Starting with the usual hyposulphite solution (1 in 6), it required 78 cubic centimetres (2½ ounces) of it to give complete solution of the silver iodide (0.5725 gramme). Hence 1 part of silver iodide requires 22.7 parts of hyposulphite for solution in a bath of 1 in 6.

Another bath of hyposulphite, twice as strong as that given above, was now tried, and it required 37 cubic centimetres (1½ ounces) of it to give a solution of the same quantity of silver iodide. Therefore 1 part of silver iodide requires 21.5 parts of hyposulphite for solution in a bath of 1 in 3. It would therefore appear that there is no economy in hyposulphite used in strong solutions when silver iodide is considered.

As in the case of silver bromide, ammonia solution has no perceptible solvent action upon silver iodide. However, a bath was made containing one-sixth hyposulphite and 4.87 per cent. of ammonia, and this was used as a solvent for the silver iodide. It required 67 cubic centimetres (2¼ ounces) of this solution to dissolve 0.5725 gramme (8.835 grains) of silver iodide. Then 1 part of silver iodide requires 19.4 parts of hyposulphite for solution in a bath of 1 in 6 containing 4.87 per cent. of ammonia. Here is a slight gain (about 11 per cent.) in the use of ammonia, and although not as great as in the case of silver bromide, yet under some circumstances it may be of advantage.

Ammonium acetate in a solution containing 30 per cent. of the salt, and slightly alkaline with ammonia, had no appreciable solvent action upon silver iodide. But when ammonium acetate is used in a solution containing one-sixth of hyposulphite and 15 per cent. of the acetate (slightly alkaline with ammonia), it required 68 cubic centimetres (about 2½ ounces) of the mixture to dissolve the above-mentioned quantity of silver bromide (0.5725 gramme = 8.835 grains). This is practically the same result as that obtained by the addition of ammonia to the hyposulphite.

The effect of other admixtures with the hyposulphite was also tried with negative results. In some cases the mixing of another salt with the hyposulphite actually decreases the solvent power of the latter. Calcium acetate was tried as a solvent, both alone and mixed with hyposulphite. Alone, in a solution of 23 per cent., calcium acetate has no perceptible solvent action upon silver iodide. Mixed with hyposulphite solution so that the mixture contained one-sixth hyposulphite and 11½ per cent. of calcium acetate, it decreased the solvent power of the hyposulphite so that it required more than 30 parts of sodium hyposulphite (in a bath 1 in 6) to dissolve 1 part of silver iodide. The same is equally true if sodium acetate is used; this also retards the action of the hyposulphite. A mixture of sal ammoniac (ammonium chloride) and sodium hyposulphite acts in about the same manner, although not so badly, solution being obtained, but very slowly. Ammonium carbonate also, when mixed with hyposulphite, also decreased the solvent action of the salt upon silver iodide, requiring about 30 parts of sodium hyposulphite to every part of the silver haloid.

* Concluded from page 540.

Two other compounds were tried upon silver iodide, for this appears to be the most insoluble of all the silver compounds with which the photographer has to deal, and it would be a great boon if some better solvent than hyposulphite of sodium could be found for it. A solution of sodium sulphite was made containing 1 part of the salt in 4 of water; but it had no perceptible solvent action upon silver iodide, even with the addition of a little ammonia.

Ammonium sulphite in a solution containing 1 part of the salt in 3 of water, had no apparent solvent action upon silver iodide, addition of ammonia making no change. But on adding a solution of sodium hyposulphite (1 in 3) complete solution was obtained after adding 50 cubic centimetres, the mixture already containing 50 cubic centimetres of the ammonium sulphite solution. It requires, therefore, about 30 parts of hyposulphite in a solution 1 in 6, with about 16 per cent. of ammonium sulphite to dissolve 1 part of silver iodide.

There are a few practical results that can be drawn from these imperfect and incomplete experiments upon the solubility of silver haloids. In the first place, there is the determination of the fact (already known in a general way) that silver iodide requires 7.8 times more hyposulphite for its solution than silver bromide in a bath of 1 in 6. Second, addition of ammonia to the fixing bath increases the solvent action of the hyposulphite so that nearly twice as much silver bromide and 11 per cent. more silver iodide are dissolved than when ammonia is absent. Third, that the addition of certain salts to the fixing bath decreases the solvent action of the hyposulphite independently of dilution. Fourth, that the action of the different salts in the fixing bath is materially different with the two haloids.

How the various additions to the hyposulphite act when applied to the fixing of plates and prints I have not yet been able to determine, but hope to do so in the future. The question up to the present time has been: Is there anything we can use, either wholly or in part, as a substitute for sodium hyposulphite? At present there is nothing so harmless and so cheap as this now almost universally used sodium salt; but the many drawbacks to its use lead me to believe that something better may be found by diligent searching. And it would appear that some such experiments as these I have briefly reviewed are steps in the right direction. At some future time I hope to have the honour of presenting to this Association a continuation and amplification of the results here noted, and hope that others will be found able and willing to work in the same field.

This, then, is a kind of report of progress in a line of experimental work that has engaged my attention during spare hours in the past year. I know it is very incomplete, I know there is little that is practical in it at present, but I am satisfied that work of this kind is needed in photography. There is room for a hundred workers upon this and allied questions in photographic science, and if I shall have interested but one of you to take up some work of this kind, I shall be fully repaid for the time I have taken to bring before you this imperfect report upon a series of experiments that have given me great pleasure in prosecuting.

ARTHUR H. ELLIOTT, PH.D., F.C.S.

THE BRITISH ASSOCIATION.

THE first General Meeting of this Association for 1887 was held on Wednesday evening in the Free Trade Hall, Manchester, which was filled with a large audience, including the leading scientific men in this country and many distinguished foreign savants. Sir Henry E. Roscoe, President, delivered his inaugural address, in course of which he made fitting allusion to the services rendered to science by two of their townsmen—Dalton, the chemist, the discoverer of the laws of chemical combination, the framer of the atomic theory upon which the modern science of chemistry is based, and Joule, the determinator of the mechanical equivalent of heat. "It is well, therefore," said he, "for us to remember, in the midst of the turmoil of our active industrial and commercial life, that Manchester not only well represents the energy of England in these practical directions, but that it possesses even higher claims to our regard and respect as being the seat of discoveries of which the value not only to pure science is momentous, but which also lie at the foundation of all our material progress and all our industrial success. For without a knowledge of the laws of chemical combination all the marvellous results with which modern industrial chemistry has astonished the world could not have been achieved, while the knowledge of the quantitative relations existing between the several forms of energy, and the possibility of expressing their amount in terms of ordinary mechanics, are matters which now constitute the life-breath of every branch of applied science. For example, before Dalton's discovery every manufacturer of oil of vitriol—a substance now made each week in thousands of tons within a few miles of this spot—every manufacturer had his own notions of the quantity of sulphur which he ought to burn in order to make a certain weight of sulphuric acid, but he had no idea that only a given weight of sulphur can unite with a certain quantity of oxygen and of water to form the acid, and that an excess of any one of the component parts was not only useless but harmful. Thus, and in tens of thousands of other instances, Dalton replaced rule of thumb by scientific principle. In like manner the applications of Joule's determination of the mechanical equivalent of heat are even more general; the increase and measurement of the

efficiency of our steam engines and the power of our dynamos are only two of the numerous examples which might be adduced of the practical value of Joule's work."

Professor Roscoe's address had mainly reference to chemical progress, and at the close he observed that up to the present time 3568 members and associates had joined, while the money received amounted to 4000*l*. These were the highest figures in both respects which had ever been reached in the history of the Association, and he had no doubt that before the meeting concluded they would have over 4000 members and associates present.

Our Editorial Table.

PHOTOGRAPHIC PRINTING METHODS.

By Rev. W. H. BURBANK.

In this volume, which forms one of *Scovill's Photographic Series*, New York, the author disarms ordinary criticism by his honest announcement that the work is rather one of compilation than of original research, and that "the opening chapters on the theory of light and its action on sensitive compounds are merely condensed from Abney's *Handbook of Photography*."

The plan of the book is to devote as nearly as possible a chapter to each method or system of printing, compiling and grouping under each all, or almost all, accessible formulæ which refer to it, and coupling with any definite statement made respecting it the name of some one responsible for such. We confess that we should have liked better had the author allowed more of his own *personnel* to appear throughout the work.

The mere mechanical labour in collating the formulæ from photographic *Almanacs* and other works of reference cannot have been small, and the reverend author is entitled to much credit for the manner in which he has carried into effect his intention as expressed in the preface: "The author has aimed to collect, in easily accessible form, information and formulæ connected with the production of photographic prints."

Mr. G. Hanmer Croughton has contributed to the work a practical article on *Finishing Permanent Bromide Enlargements*, which we here introduce:—

"In working upon drawing-paper, from life or from photographs, the paper chosen is one that is strongly sized, because a higher degree of finish can be obtained upon such a surface. In the necessary manipulations of preparing the paper for solar prints—the developing and fixing and subsequent washing—the sizing of the paper is entirely washed out; it is so with the platinum print, the hot developer taking the size out of the paper and making it as soft and absorbent as blotting-paper. With a permanent bromide print, although it has to undergo all the manipulations of development, fixing, and washing, the gelatine surface is not removed, and when dry serves as a strong sizing to the paper. This necessitates a somewhat different method of treatment than upon the softer paper, but all the manipulations for producing an artistic effect upon solar or platinum prints can be followed upon permanent bromide, and from my years of experience I can say confidently that the best results can be obtained quicker and better.

"*Crayon Finishing*.—The only difference is in the material used. Instead of using a stumping sauce alone, I find a mixture of No. 1 Conti Crayon, finely crushed with an equal quantity of crayon sauce, the best for all stumping purposes. Most crayon artists put in their background with a chamois leather. You cannot use a chamois skin upon permanent bromide paper, but a soft tuft of cotton is just as effective and can be manipulated in exactly the same manner; then the fingers can be used as a stump, and the background graded with the above mixture, worked with the fingers quicker and better than with the stump. If you should get your background too dark or uneven, lay the picture flat, sprinkle a little pumice powder over it and rub lightly with the fingers all over, using more powder where you wish your background to be lighter.

"The stumping of hair, shadows in drapery, &c., can be done with a paper stump with the mixture above, in exactly the same manner as upon any other paper, with the difference that the print being so much more perfect in gradation and more brilliant than a solar, there is not near so much stumping needed. In fact, a good permanent bromide enlargement needs very little stumping, the principal work being sharpening and deepening with the point, and flat tints with the mixture, over drapery, &c. The shadows of drapery can be deepened with Nos. 2 and 3 Conti, in the usual manner, softening and grading with the finger or stump.

"The use of rubber and ink-eraser for taking out lights is well known to crayon artists. The same method of taking out the lights can be used on permanent bromide paper and with greater effect, for the lights can be taken out cleaner and with greater facility than upon absorbent paper, where the crayon is rubber right into the fibre of the paper. Another advantage is that you can use the scraper upon these prints for taking out lights and even lightening dark places. With a sharp scraper lights can be taken out in lace, white draperies, &c., giving great brilliancy without

abrading the paper, for the picture being entirely upon the surface, you can scrape quite through the deepest tint before reaching the paper itself.

"The finishing of the face must be done with a harder crayon than usual, as the harder surface of the paper requires a harder crayon to work upon it. The best for the purpose is No. 0 Conti superfine in wood. A No. 1 of the same kind will also be required for the darker touches. This work upon the face is more in the manner of mending and joining gradations than the usual work upon the solar, and it is in this respect that a permanent bromide print is so much superior to any other, and requires so much less work, while the result is much finer.

"*Pastel*.—With the pastel there is no difference in the manipulations, the gelatino-bromide taking pastel with the greatest facility.

"*Water Colour and India Ink*.—For water colour or ink it will be necessary to wash the surface of the print with a weak solution of ammonia till all the greasiness disappears, and to be careful not to wash one colour over another till the first is thoroughly dry, not alone surface dry, but be careful that the gelatine is dry before washing over the same place, or blisters may result.

"*Note*.—In case any paste has been allowed to get on the face of the print, in mounting, it should be washed off with tepid water and a soft sponge, and the print allowed to dry thoroughly before any crayon work is done on it.

"It has been found by experience that prints take the crayon better if they have been dried and afterwards soaked in water before mounting. The preliminary drying hardens the film."

The work contains two illustrations, a frontispiece by the excellent engraving process of Mr. Edwards, of the Photogravure Company, New York, and a bromide print from an Eastman film negative. The typography and general get-up of *Printing Methods* leave nothing to be desired. The price is one dollar (four shillings and twopence).

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 11,451.—"Lyne's Perfect Photographic Print Washer." E. H. B. LYNE
—Dated August 23, 1887.

PATENTS COMPLETED.

A NEW OR IMPROVED POCKET OR PORTABLE APPARATUS FOR THE TAKING OF PHOTOGRAPHIC PICTURES.

No. 12,571. WILLIAM JAMES LANCASTER, Colmore-row, Birmingham.—
October 4, 1886.

My invention has for its object the production of an extremely portable apparatus for the taking of photographic pictures, and which said apparatus may be made either in the form of a watch or chronometer case, tobacco box, match box, cigar or cigarette case, purse, locket, charm, or other like article, by which means a person is able to carry a complete photographic apparatus in a very small compass.

I will describe my invention in connexion with a watch or chronometer case to be carried in the pocket or about the person.

I take an ordinary watch case having a hinged closing front or lid which is automatically opened by pressure applied at the side or at the loop part, which liberates a catch bolt, and so allows the enclosing lid to fly open.

Within the hollow of the body of the case the camera is situated, which consists of a number of short tubes working telescopically one within each other, so as to render the same collapsible when not in use. The back tube of these series of tubes, which is of larger diameter, is secured loosely within the inner edges of the open front of the case by a flange connexion, and within the inside of this telescopic body a coiled spring is enclosed which automatically distends or opens out the camera body on the lid of the case being opened. The lens is secured within the last or outward tube, while the dark slide, which contains sensitised paper, gelatine sheets, or prepared plates, is disposed at the back.

The focussing of the lens may be done by any suitable adjusting expedients or by hand.

The dark slide consists essentially of a flat case with folding overlapping doors having spring hinges which automatically open the said doors on a catch or other fastener being liberated. The catch fastener consists simply of a button or turn, which on being rotated is made to engage with or be disengaged from one of the doors.

The back of the enclosing case is pierced with a hole suitable for the reception of the frame of what is commonly known as the dark slide, and which is held in position by rotating turns or catches moved in and out of position preferably by hand.

In using the instrument or apparatus in order to take a portrait, simply press the releasing catch of the enclosing lid, when it automatically flies open and allows the body of the camera (and lens within its front) to be distended to its fullest extent by the expansion of the enclosed coiled spring.

After focussing, a button or turn at the back of the case is rotated, when the doors of the dark slide automatically fly over, and so present the sensitised surface or plates enclosed within.

After sufficient exposure has been allowed, the lid of the enclosing case is simply closed, when the collapsing body of the camera and the lens at its end is folded up and enclosed within the body of the case, when the negative can afterwards be removed from the dark slide, and placed in a printing frame as usual.

The apparatus or appliance is principally applicable for taking instantaneous photographs for detector purposes.

The bellows constituting the body of the camera may be formed gusseted, when made of leather or indiarubber, or the said body may be made of a coiled riband spring with the coils or involutes working telescopically one within each other.

Instantaneous shutters may be provided at the lens end of the photographic apparatus, or at the dark slide end; in the latter case, the shutters or doors are made to instantaneously open and close by an automatic or other device, which may be regulated to any predetermined exposure as may be necessary.

The application of my invention to other articles, such as purses, cigar and cigarette cases, lockets and other pendant articles, differs in no essential respect to a watch case as already described.

The claims are:—1. The means herein described of taking photographic pictures, by combining with a watch or chronometer case, cigar or cigarette case, tobacco box, match box, purse, locket, charm, or similar pocket or pendant article, of a photographic apparatus. 2. The combination with a watch or chronometer case, cigar or cigarette case, tobacco box, match box, purse, locket, charm, or other similar pocket or pendant article, of a photographic apparatus, constructed, arranged, and worked substantially as described and set forth. 3. Making the camera bodies, of portable photographic apparatuses of the kind herein described, distend themselves automatically, from the front cap being opened, as described and illustrated. 4. Providing "dark slides" or boxes for holding photographic sensitised plates, films, or paper, with spring hinged folding doors, or shutters, and which said boxes are constructed, and the doors or shutters held (closed) and liberated by means herein described and illustrated.

IMPROVEMENTS IN MACHINES FOR COATING PHOTOGRAPHIC PLATES.

No. 12,700. BENJAMIN JOSEPH EDWARDS, The Grove, Hackney, London.—
October 6, 1886.

To provide improvements in certain parts of the machine for coating photographic plates with gelatine emulsion, for which letters patent were granted me in 1884, No. 8643, or in other machines for the same purpose.

The improvements are designed—1, To effect more perfect contact between the distributing roller and the edge of the scraper which carries the emulsion to the plates; 2, To effect the more rapid and perfect setting of the emulsion or cooling of the plates when coated; 3, To provide travelling bands of greater utility and durability for carrying the plates; 4, To effect the more perfect cleaning and drying of the backs of the plates, together with greater facility of working and saving of time and material; 5, To provide for colouring the backs of the plates; 6, To effect the removal of particles of dust from the surface of the plates previous to coating.

I effect the improvements in the scraper by introducing a separate adjustable blade of indiarubber or other suitable material of a soft and yielding nature, which is inserted in or attached to the metal scraper and may be removed from time to time as required.

I effect the improvements in the cooling of the plates and setting of the emulsion in the following manner:—In place of the continuous close tunnel or cooling chamber as described in my former specification, through which the plates are made to pass, I construct the roof of the said chamber of a series of bars, which may be of the form of the letters S or Z, and upon a grid formed by these bars I place lumps of ice. I fix the bars in such proximity to each other and incline them at such an angle that they shall carry off the water from the melting ice and also the water of condensation which forms on their lower surfaces, and at the same time allow for the passage of a current of intensely cold and partially dried air to the plates as they pass underneath.

To provide improved travelling bands for carrying the plates I do not alter the general construction of the ordinary woven wire band which I have hitherto employed, further than to insert two or more wires which may be somewhat stouter than the rest, which are woven in and run the entire length of the warp, and I cause these wires to be woven over cross wires of suitable thickness at short intervals. The cross wires being afterwards withdrawn, each of the stouter wires is left, forming a row of projecting loops upon which the plates rest slightly above the surface of the rest of the band. If preferred the loops may be formed in the web instead of the warp.

To effect the improvements in cleaning and drying the backs of the plates I make use of a similar arrangement to that described in my former specification, but I make the surface of the cleaning band of soft cloth, felt, woollen velvet pile, or other suitable material, and I arrange it to pass over one or more rollers, so adjusted that the under side of the coated plates shall rest upon and be drawn or pushed (by the action of the travelling band) over its surface while it is made to travel slowly in the opposite direction. Thus any emulsion which may have escaped on to the backs of the plates is removed on to the band which passes through a tank (through which a stream of hot water is kept constantly flowing) before coming again into use. More than one cleaning band may be employed if desired. To remove any excess of moisture I arrange one or more strips of indiarubber, or other suitable material, to act as a scraper or squeegee, over the edge or edges of which the plates pass as they enter the cooling chamber.

The above-described cleaning apparatus may be dispensed with altogether if desired when my improved endless wire bands, as specified above, are employed, in which case any emulsion which may have escaped on to the backs of the plates is dried on, and, if necessary, afterwards removed by hand or by other convenient method.

In order to keep the cleaning band (or in the event of the travelling bands only being used to keep these) as clean as possible, and also to economise the material used, I employ a narrow trough or receptacle of porcelain, glass, or metal, which I fix immediately below the lower edge of the scraper or distributor, from which the emulsion flows on to the plates, keeping its upper edge slightly below the surface of the travelling bands, space being obtained by arranging the rollers over which the bands pass (as described in my previous specification) so as to allow for the insertion of the trough. Thus any of the emulsion which escapes is caught by the trough and may be used again.

To provide for colouring the backs of the plates I employ one of the cleaning bands (if more than one is provided) or I arrange an additional band of similar construction, and by passing it through a solution of suitable colouring material I carry a portion of it to the backs of the plates and thus prevent the defect in

photographs on glass known as halation. When the colouring band is employed the squeegee are dispensed with.

To effect the removal of particles of dust from the surfaces of the plates before coating I employ a revolving or stationary brush secured immediately in front of the distributor, so that the plates shall be brushed as they are drawn or carried by the band into the machine.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
September 5.....	Notts	Institute, Shakespeare-street.
" 6.....	Coventry and Midland	Coventry Dispensary.
" 6.....	North London	Myddelton Hall, Upper-st., Islington
" 6.....	Glossop Dale	Society's Rms., Norfolk-sq., Glossop
" 6.....	Holmfirth	
" 6.....	Sutton	Society's Rooms, 18, High-street.
" 6.....	Sheffield	Masonic Hall, Surrey-street.
" 6.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 7.....	North Staffordshire	Mechanics' Institute, Hanley.
" 7.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 8.....	Birkenhead	Free Public Library, Hamilton-st.
" 8.....	Bradford Amateur	Grammar School.
" 8.....	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, August 25, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. J. Traill Taylor presided.

The CHAIRMAN exhibited the results of his experiments to obtain good negatives upon plates which ordinarily gave fog, as described at the previous meeting; he maintained that similarly clean results could not be obtained by ammonia development.

Mr. A. L. HENDERSON thought that it would be fairer to let him have one of the plates to see if he could not get an equally good printing negative by ammonia development. A sulphite developer suited a slow plate.

Mr. B. WOLLASTON believed that equally good negatives could not be obtained with ammonia.

Mr. A. COWAN thought it to be possible to obtain as good results with ammonia and pyrogallol.

The Chairman exhibited a photograph taken by Mr. Joseph Gray of a flash of lightning.

Mr. COWAN hoped that there was no joke about it, for it looked like a print of a piece of cotton laid upon paper.

Mr. J. BARKER said that there was no halation such as usual with lightning flashes.

Mr. A. HADDON had never seen a flash of electricity which turned upon itself so as to form loops, as in the print.

Mr. WOLLASTON thought it impossible for a flash to so turn upon itself.

Mr. HENDERSON supposed it might be a flash of greased lightning. He was willing to write to Mr. Gray for full details of the conditions under which it was photographed.

The Chairman exhibited a pretty good view photograph by Mr. Dunmore, taken without lens, camera, or stand. A hole had been pricked in a piece of tinfoil and fixed upon the top of his felt hat, the plate had been placed in the hat some distance from the crown, and the light had been kept from the back by stuffing in a handkerchief; the exposure had been of half an hour's duration; it was a fair photograph, quite sharp.

Mr. H. M. Smith exhibited Eastman's new light-weighting roller slide, as described by him at the previous meeting.

Mr. WOLLASTON said that it had a clever frictional arrangement to keep the paper tight.

Mr. Henderson exhibited Bracher's automatic still for distilling water over an ordinary household fire.

The CHAIRMAN stated that Mr. John Stuart, of Glasgow, was selling large photographs of a group taken at the Convention at a cheap rate to members of the photographic craft.

Mr. Atkinson exhibited some very good quarter-plate landscape views he had taken in the Killarney district.

The CHAIRMAN remarked that a German periodical had published a good photograph of a meeting of the German Photographic Society; the members were indulging in lager beer, and had the appearance of being jolly good fellows.

Messrs. A. P. Higgins and E. G. Dornbush were elected members of the Association.

The meeting was then made special to deal with matters relating to the new rules, after which it adjourned for a week.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting was held on Thursday, August 25, at the Royal Institution.—The President, Mr. George H. Rutter, in the chair.

The minutes of the last meeting were read and confirmed.

Mr. RUTTER reported on the Southport excursion in the absence of Mr. B. Bootliroyd. It appeared that only five members took part.

The HON. SECRETARY read report of the Ingleton excursion on Bank Holiday. Seven members and five friends, carrying in all nine cameras, were present; seventy exposures were made, of which thirty were 11ford plates, twenty-four Eastman films, and sixteen Edwards's plates.

Mr. A. W. BEER reported that the Tonge and Lilleshall excursion did not come off, as only two members gave in their names beforehand.

The HON. SECRETARY read report of the Frodsham excursion, in which only three participated, who made seventeen exposures, the weather being dull.

Mr. E. ROBERTS gave an account of the Obernetter's emulsion paper, on which he showed several prints; he also exhibited Newman's patent alhutter.

The Hon. Secretary showed prints on Rivet's self-toned paper, also a series of prints from the Ingleton excursion.

Work was also exhibited by Messrs Sayce and Day.

Mr. W. A. WATTS opened the discussion on Mr. Beer's paper on a new development. He quite agreed with slow and tentative development, having practised it in his own work, but he had not previously tried the developer recommended by Mr. Beer, namely, the American Standard Developer, which, he said, many persons confused with Beach's. He worked Eastman paper exclusively, employing first the Eastman soda formula; not liking the working of that, he tried carbonate of potash, using it proportionally to the carbonate of soda. Although he had read of the American Standard or ferrocyanide developer, he had not thought it could surpass the potash one until he saw Mr. Beer's negatives; but, being much struck with their beauty, both for gradation of density and freedom from stain, he had made up some ferrocyanide developer, and tried it with very great satisfaction and success. He no longer needed to use clearing solution, as the films were quite free from stain, and he recommended those present who had not yet given this developer a trial to do so.

Mr. BEER had heard that some persons found the American Standard Developer to stain; he thought that when that was the case it might arise from the omission of the sulphite of soda.

Mr. RUTTER had thought that the ferrocyanide developer was not suited for Eastman films, and he pointed out that in the Eastman instructions for stripping films they direct that not more than six of sulphite of soda must be used to one of pyro, whereas Mr. Beer's formula gives four ounces of a ten per cent. solution, or one hundred and ninety-two grains of sulphite of soda to six grains of pyro.

Mr. B. J. SAYCE said that if a plate was duly exposed there was no difficulty in development, but if under or over exposed then came the difficulty, and that was intensified by the fact that we work by seconds and fractions of seconds where the older processes took minutes; if, for instance, the correct exposure was one-one-hundredth of a second and we gave only one-two-hundredth that was a large amount to pull up, but it might be done by slow development. He generally gave slow development—half an hour on an average, but one of the interior of Speke Hall took an hour. As an encouragement for patience in slow development, he had given, when using the shortest exposure on collodion-albumen plates, as much as a week in development.

Mr. J. H. DAY said as American development had many advocates he would speak in favour of the older Swan method coupled with slow development. He used one drachm of ammonia and one drachm of bromide of potassium in ten ounces of water, dissolving dry pyro in an equal quantity of water, using ounce for ounce of solution, but beginning with only one-third of the quantity of ammonia solution and adding the remainder as development progressed.

Mr. Sayce showed a new note-book that he had prepared specially for his own use, but which any printer or publisher was at liberty to copy. It is intended to meet the wants of those who use the roller slide, and contains a column for the *winder's initials* to be added as soon as wound off, thus obviating double exposures.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of the above Society was held in the Technical Schools, Bridge-street, on Thursday, the 25th ultimo.—Mr. G. A. Thomason in the chair. Forty-nine members present.

The minutes of the last meeting were read and confirmed.

The following gentlemen were nominated for election:—Messrs. Greening, Coppall, Shilton, and Venour.

The HON. SECRETARY (Mr. J. H. Pickard) read a letter from Mr. B. Karleese, relinquishing the co-Secretaryship on account of pressure of business and ill-health.

A number of members having spoken with regret of the loss to the Society of the help of Mr. Karleese, it was resolved unanimously that the best thanks of the Society be given to him for his past valuable services, and hoped that he would soon be able again to render his great help and assistance.

Mr. W. Rooke was elected to the vacant co-Secretaryship.

A number of photographs were shown, taken during the holidays by Messrs. Harold Baker, Leeson, Godfrey Thomason, Tylar, and J. H. Pickard.

Mr. S. DELICATE read an instructive paper on *Outdoor Photography*. In the course of his remarks he said the paper was intended for beginners and members who had recently joined the Society more than for the older members. He divided it under three heads—The Lens, The View, and The Development, and pointed out that the best lens for general outdoor work was one of rapid rectilinear or rapid symmetrical type, these being the proper lenses for architectural subjects. But in some cases, as landscape with only such buildings as cottages, a single view lens would often give brighter negatives than the former; and in some views it is necessary to employ a wide-angle lens to enable the photographer to get in all the view he requires. The ratio of the stops was next explained, and it was shown how the stops may be measured and numbered. Under the second head—The View—the speaker remarked that every photograph ought to be so taken that it will have a striking and also a pleasing effect at first sight. Several kinds of composition were then explained, light, and shade, and contrast, were dealt with, and directions were given as guides to correct exposure. In the last part it was considered how best to develop a plate after it had been exposed. He kept all his chemicals in separate bottles, and by this means was able to modify his developer to suit any plates or any exposure; then explained how to treat different exposures. For an over exposed plate, mix a developer with a good supply of pyro, a large quantity of bromide, and a very small quantity of alkali; but for an under exposed plate the developer would contain very little pyro, little bromide, and a large proportion of alkali, to commence with. As soon as the details were well out add more pyro and bromide to obtain density.

Concluding by saying that an amateur having mastered the use of his lenses, how to place a view on the ground-glass in an artistic manner, and develop the negatives properly, had secured a good grasp of what is necessary for outdoor photography.

A discussion followed, which brought forth a challenge from Mr. Dennison that no good landscape could be taken on an Ilford plate, which provoked considerable remarks and comments. The challenge was taken up by Mr. Welford, who undertook to disprove the same at the next meeting.

Mr. TYLAR read his report of the excursion to Tintern and Lymonds Yat on August 1 last. He said, leaving Birmingham by Great Western Railway at five a.m., we arrived at Lymonds Yat at fifteen minutes past eight, having had a long ride through magnificent scenery. A considerable number of views were taken here, one not having far to wander to obtain good views. Taking the train again, we proceeded to Tintern, *via* Monmouth. On arriving we rode to the Abbey by brake. The ancient ruins were admirably suited for picturing making, both exterior and interiors giving numerous good effects of light and shadow. It was intended to have gone on to Chepstow, but the daylight waning, the remainder of the time was spent in strolling about till the departure of our train, which arrived back into town at fifteen minutes past eleven p.m., having had a long day's outing, but a very enjoyable one. One hundred and thirteen plates were exposed, namely, eighty-three Ilford, six Abney, and twenty-four Eastman stripping films.

Mr. WELFORD gave a short paper on the *Wants of Amateurs*, and exhibited a detective camera (German) with which he had had considerable success; and the meeting terminated with the announcement of the paper for September 22 namely, *Stripping Films*, by E. H. Jaques.

Correspondence.

Correspondents should never write on both sides of the paper.

NOTES ON DAGUERRE FROM A MANUSCRIPT WRITTEN BY M. MENTHENNE, EX MAIRE DE BRY-SUR-MARNE, A PERSONAL FRIEND OF THE INVENTOR OF PHOTOGRAPHY, KINDLY COMMUNICATED TO PROFESSOR STEBBING BY M. GLAISE.

LOUIS JACQUES MAUDÉ DAGUERRE was born at Cormeilles en Parisis, Seine et Oise, the 18th of December, 1787. His father, a clerk in the Financial Department of the State, desiring to give his son an honourable profession, placed him, when yet young, under an architect. The youth manifested very early a decided taste for painting. His parents used their influence to divert him from this art, but in vain; his resolution to be a painter was immovable. His father, yielding at last to his great desire, apprenticed him to Degotis, decorator of the Opera. It was not long ere the young Daguerre made rapid progress in the art he had chosen. Important decorative work was confided to him, and he soon gained the reputation of being a talented artist.

He received an order for a theatrical scene for the l'Ambigu-Comique, and made a complete revolution in this style of decoration. His paintings for that theatre are still cited as *chefs-d'œuvre*—*The Dream in the Chapel of the Castle of Glenhorn, De la forêt de Senart, &c.* He then executed, in collaboration with M. Cicéri, the decorations of the wonderful lamp for the great Opera; the magical effect of his rotating sun was remarkable. He assisted Pierre Prevost in the execution of his panoramas of Rome, Naples, London, &c. About this time he associated himself with the painter Bouton, for a moment a rival of Horace Vernet, in view of a panoramic establishment, in which light was made to act in order to give mobility to the effects as well as a charm to the coloration. This establishment was opened to the public on the 11th of July, 1822. Here he offered to the astonished view of the spectators most admirably painted pictures, which, by the different effects of light, were made to pass from daylight to night, and from one scene to another. Renown spoke of a valley in Switzerland: Holyrood Chapel—this was so wonderful as regards painting, as well as scenic effect, that the Government decorated him with the Cross of the Légion d'Honneur (1824). *The Abbey of Roslin in a Fog*—which transformed itself into a snowstorm, *The Fire of Edinburgh, The Deluge, A View of Paris taken from Montmartre, The Tomb of Napoleon at St. Helena, The Mont Blanc, The Black Forest, The Midnight Mass at St. Etienne du Mont, The Temple of Solomon*—this was his last production for his diorama (1839). This exhibition gained for its author universal renown; foreigners came from far in order to witness such a novel and wonderful sight.

Master of his art, Daguerre produced by his perspective the most complete illusion—darkness to light, as well as all the atmospheric variations, were scrupulously represented. All at once the spectators were carried, as it were, into the centre of an immense cathedral—the arched roof, the immense pillars, and the coloured glass windows admirably portrayed—perspective had created space with striking reality. Then the admiring sightseers were shown a landscape lighted up by the silver beams of the moon, a castle hidden in the shade of a grove of trees, the heavens beautifully decorated with silver and golden tipped clouds. As a type of these changing panoramas must be cited the famous *Midnight Mass*, seen at first by daylight, then during the night service. This change was obtained upon the same picture, and without removing it in the least.

The 3rd of March, 1839, a fire devoured these *chefs-d'œuvre*, and many others having a great artistic renown and value. This was, indeed, a

misfortune. From that time up to the present day no establishment of the kind has been got up.

Through this inauspicious event the fortune of Daguerre was very much curtailed. He continued, nevertheless, to occupy himself with the different effects to be obtained by light. Since 1834 he had been seeking to fix the image obtained in the camera obscura. This idea had been ridiculed by all those he had spoken to on that subject, with the exception of the eminent chemist, J. B. Dumas, *l'illustre savant de l'Académie Française*, who gave him every encouragement to continue, and prognosticated his future success. In fact, as a recompense for the loss he had sustained by his fire, towards the end of April, 1839, he discovered the means to fix the reproduction of nature by means of light.

Henceforth an immense fortune appeared to lay beneath his grasp. Brilliant offers were made to him by foreigners for the purchase of his secret. England, which is never behindhand, offered him 10,000*l.* sterling and an annuity of 1000*l.* Prussia and Russia made him most brilliant offers. The United States offered to give him whatever he might demand. But Daguerre was resolved to give the honour of his discovery to his native country. The statesmen of France voted him unanimously a national reward in the form of a pension for life.

By a deed executed before a notary, signed June 15, 1839, he took the solemn engagement to reveal the process he had discovered to obtain proofs by the aid of light, as well as to publish the means he employed to obtain such admirable effects in his dioramas. For this abandonment of his invention he was to receive from the State the humble pension of 240*l.* per annum. The Government decorated him *Officier de la Légion d'Honneur*; the King of Prussia sent him the Order of Merit; the Emperor of Russia sent him a handsome present; the Universities of Edinburgh, Vienna, Munich, and New York sent him the diploma of honorary member of their respective colleges.

Daguerre, desiring to rest a little from his labours, purchased a charming villa in the hamlet of Bry-sur-Marne. He occupied himself in embellishing his dwelling, and there he spent, with his worthy and respectable wife* and his niece (not having any children of their own) the happiest portion of his life. At the same time he did not neglect his taste for scientific subjects. Probably to please the priest he took it into his head to decorate the humble village church. Behind the high altar he prepared a canvas frame nearly five yards square, lighted from above; upon this he painted one of his very effective pictures—the only one left which can give the visitor an idea of what his Diorama was before its destruction.

The decoration represents a Gothic edifice from the *jubé* to the choir. This changes totally the aspect of the little village church, giving it the noble and majestic appearance of a cathedral. The visitor remains in wonder and admiration, looking at the numerous details of that holy scene. The curves of the archwork are so exquisitely rendered that the air appears to float among the pillars and the breath of prayer whispers among the arched buttresses. Spiders' webs can be seen hanging from the acanthus of the chapiters. In the foreground, Christ upon His cross appears about to descend. On the other side a wax taper is represented as being just extinguished, wafting its slightly curled and transparent smoke towards the skies, leaving the wick glowing red. Many other details could be mentioned which when touched are but optical illusions! By this last piece of work Daguerre appears to have left a pledge of his friendship and high esteem for the inhabitants of Bry-sur-Marne.

During his retreat he occupied himself with his favourite studies. He became a member of the Free Society of Fine Arts, established in 1830, and assisted very regularly at their meetings. It appears he sought diligently to obtain instantaneous results for his photography. In the year 1844, at the meeting of the Free Society of Fine Arts held on January 30, he communicated his hopes that he had found a new chemical of which the sensitiveness was so instantaneous that he intended to make the portrait of a horse at full gallop. "The effect is so prompt," said he, "that I can only compare its rapidity to the velocity of the electric spark." Daguerre was very particular and difficult as to the perfection and easy application of his inventions. Perhaps he did not attain the success he desired as to rapidity, for at his death nothing could be found relating to this subject, which appears strange and unaccountable.

He endeavoured to bring designs in pastel to perfection by seeking a manner to fix the colour upon its support so as to do away with the protecting glass which was necessary at that time. It appears he met with many difficulties in order to preserve the velvety appearance so precious in that kind of drawing.

At the moment when death knocked at his door he was occupied with a new process of monochrome painting on glass to be seen by reflection. The glass replaced the best varnish, and gave a highly glazed appearance to the finished picture. The specimens he left are painted with black paint, very vigorous indeed in tone. The half tones are obtained by means of the semi-transparency of the coating, this coating being more or less thick according to the taste of the artist. A coating of white to finish up gives depth of shadow. Several landscapes executed by this process were terminated, and one nearly finished was found upon the easel. As to the mode of production and preparation it can only be surmised, as nothing was left by him on the subject.

Although busy in study and science, he was not against rendering service to the inhabitants of the village he had chosen for his retreat.

* Louise Arrowsmith, an English lady.

Advice and help was not withheld from those who had chosen him to represent them on the Municipal Council.

He received many visits from strangers and foreigners; photographers and artists came even from America, among them Messrs. Meades, who took the portrait of the master they came to honour with the intention of reproducing it on the other side of the ocean, to make the features of the celebrated artist known to their countrymen.

He was very friendly with *Mdlle. de Rigny*, niece of the Baron Louis de Rigny, the great banker. This lady was owner of the greater part of the village, very learned, at the same time advanced in science. Daguerre found great pleasure in her society.

In 1848, during the great Revolution, the inhabitants of Bry were in the greatest distress. He occupied them in the park of *Mdlle. de Rigny* in making a miniature representation of Switzerland. Mountains, rocks, old castles, ruins, lakes, bridges, &c., all were represented on a large scale. A double object was here obtained—an artistic work was accomplished, and the workpeople were prevented from frequenting the national workshops, where bad doctrines were inculcated rather than honest work counselled.

Daguerre died suddenly on July 10, 1851, in the prime of life. A few days before his death he took part in the work of a commission *des Beaux Arts*, and nothing could prognosticate that his end was near.

His loss was universally regretted. When the sad news reached the New World the photographers there sent addresses to his widow, expressing the deepest regret for her bereavement. In order to show their admiration and acknowledgments to Daguerre, they wore mourning during eight days, in sign of sorrow for his loss. A sum of 2000*l.* was collected to build a monument to his memory at New York, so as to show to all nations that the American photographers admired and appreciated the invention of Daguerre.

The mortal remains of this great artist repose in the cemetery of Bry-sur-Marne, where a monument has been erected to his memory by the *Société Libre des Beaux Arts* in the midst of those he loved, surrounded by his friends, which he considered as belonging to his own family.

M. Glaize writes me to-day, "The monument is in stone, two and a half yards high. In the centre is the bust of Daguerre. The inscription is:—

A.
DAGUERRE,
La Société Libre des Beaux Arts.
MDCCLII.

"On the back of the stone is the date of his birth and death, also that of his wife, who survived him six years."

DUBLIN PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—May I, through your columns, remind intending exhibitors that the time for sending in is now approaching, the 15th October being the last day on which pictures, &c., can be admitted? Prospectuses, entry forms, &c., can be obtained from the undersigned.—I am, yours, &c.,
GREENWOOD PIM, Hon. Sec. Exhibition Committee.

Monkstown, Co. Dublin.

P.S.—It would much facilitate if applicants would kindly say how many labels they desire.

THE AMERICAN STANDARD DEVELOPER.

To the EDITORS.

GENTLEMEN,—Your effervescent and sparkling contributor "Monitor," scarcely appears to have taken in Mr. Beer's meaning in his valuable paper on "slow development" read before the Liverpool Amateur Photographic Association, at least, so I judge from the tenor of his remarks. The absolute amount of potash solution to be employed depends, of course, very much upon the amount of exposure the plate has received, and Mr. Beer doubtless gives a very full exposure, so needing a weaker developer to finish with than perhaps many others might do, or than "Monitor" himself would do were he to condescend to try the "American Standard Developer," which, from the tenor of his "Echoes," I conclude he has not yet done. In referring to Mr. Beer's advice to begin with one drachm only (one-eighth normal strength), it must be borne in mind that this is only tentative—should there be much over exposure no harm will have been done, whereas if development does not begin it is easy to add more potash solution.

May I venture further to reply to "Monitor's" question (I don't know to whom addressed), "What constitutes the American Standard Developer, and who appointed it standard?" On page 275 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1887, he will find given the *Standard Developer of the New York Amateur Society*. It was recommended as a standard developer by a Committee of the Society in question, specially appointed to consider the subject of dry plates and developers. I regret I cannot at this moment lay hands on their report, but it has appeared in the photographic journals, and therefore has as much claim to be considered standard as, for instance, the Standard System of Stops of the Photographic Society of Great Britain.—I am, yours, &c.,

THE HON. SEC. LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

PHOTOGRAPHY WITHOUT CAMERA OR LENS.

To the EDITORS.

GENTLEMEN,—Enclosed please find a photograph taken without any of the usual apparatus—no lens, no camera, and no stand. It was made in this way. A bit of tinfoil was gummed over the ventilator of my felt hat, in which a small hole was made with a needle, a plate was stuck by the corner inside the hat, a large red pocket-handkerchief stuffed in behind it, over which I placed my coat. The hat and its contents were then set level as I could judge on a coil of hose that happened to be lying handy, and exposed to the view for half an hour, that was all. The result you will see is a fair photograph, but not quite sharp. Perhaps a smaller hole and longer exposure might improve matters.—I am, yours, &c.,

Beacon Hill, N., August 25, 1887.

EDWARD DUNMORE.

FIFTY SITTINGS FOR A PORTRAIT.

To the EDITORS.

GENTLEMEN,—I have been scanning with interest the correspondence in your columns about the use and uselessness of photographs to artist-painters, and as I have had some experience in the matter, both practically and theoretically, I may be allowed to premise that the parties on both sides of the question are right individually.

That photography can effect an immense saving of time to the sitters getting their portraits painted, no matter by whom, but that the art of the picture is proportionably enhanced is problematical, to say the least of it.

Then, with many artists (some of whom are under the suspicion of mercenary-mindedness) of no small ability, the use of photographs not only aids them greatly with their work, but it enables them to send out far more likenesses than they could possibly do if working from the sitters alone. Some trained artists of great popularity, both in Scotland and England, to my knowledge, neither scruple to use or tell you they use photographs whenever suitable ones present themselves. Sometimes even the negative of a favourite portrait is borrowed for the purpose of throwing the image on the canvas and outlining it with the pencil.

There is a class of artists, however, who cannot use photographs, and, curiously enough, those whose sense is strong in form would think that said class, from their weak draughtsmanship, would be none the worse of a lesson from the accurate forms of photography; but no, such artists are in pursuit of other truths, so few of them concern themselves about severe form. Firm, accurate form with them is mere still life. Loose, shifting form lives or moves. So to the artist striving to reach the higher ranges of nature, the spirit of things carries him captive, and consequently he is apt to spurn matter-of-fact photography, yet knowing and feeling all the time that photographic truth is precious, but that it is nevertheless far down the scale of truth.

But beside all this, there are artists of the highest susceptibilities to the subtle power of colour, who for the life of them could not draw accurately enough, as a rule, to make a striking likeness, and yet these men will be the last to use photographs; and why? Simply because they, too, are spellbound by Nature while she is in the mood of displaying her beauty or her mysteriousness—a mysteriousness that none but an artist can know, so much has colour to do with such appearances.

Seeing, then, that the practice of art is so much a matter of idiosyncrasy, the solution of the present question is obvious, and accordingly it may be asserted that the painter-artist, whether weak or strong in form, if of the peculiar cast of mind indicated, has no need of—indeed, cannot use—photographs. Such minds will grapple with the higher difficulties of art, that they may render in their work the higher real, the true ideal, in nature, while those who can use photographs, although to great advantage at times, must, as a rule, be content with a lower excellence in their work, however much they may strive to also reach the higher truths. How could it be otherwise? Can a photograph speak like Nature herself? No, undoubtedly no. Why, when a painter is under the influence of natural appearances he has no control over himself. Nature is a tyrant at such momenta, and will drive him to despair if he fails in his ability to render her teachings. Has any one felt the power of a photograph so strongly? If not, only one inference can be drawn.—I am, yours, &c.,

Edinburgh.

JOHN PATRICK.

To the EDITORS.

GENTLEMEN,—As my answer in last week's JOURNAL does not seem to have given complete satisfaction to "A Painter," I will try to give him what I think will prove such, if you will kindly allow me the space. In his last letter he states (without the least regard to facts, although I advised him to rephrase the "par." in my original article) that I, speaking of Sir Joshua Reynolds and Sir Thomas Lawrence, "told us how many sittings they wanted to produce a portrait, and that nowadays, by the aid of photography, we have done with such troubles." As I suggested, this is not true, as may be found by reading my "par." on page 406 of the JOURNAL. If I had said such a thing I would have been laughed at, and deservedly—but I didn't. I simply stated that Sir Thomas Lawrence and Sir Joshua Reynolds "have repeatedly had as many as fifty sittings for a portrait," and so on; but although they had so many I can scarcely think they absolutely wanted them all. It was sufficient, however, for the purpose of my article to mention the fact of its being recorded that these celebrated artists had had that number of sittings.

A great grievance with "A Painter," too, seems to be that I should have thought it possible for such illustrious men to receive help from photography, or even dare to mention their names and photography in the same breath. Might I ask what he suggests by asking, "Now, to what comes the help Mr. R. Barrett advises us to obtain from photography?" This I can only answer by saying that if "A Painter" can honestly thus place himself in such company as Sir T. Lawrence and Sir J. Reynolds I might be disposed to say, "Don't look for such help."

"A Painter" was very unfortunate in last week's selections for quotation from my letter wherein he mentions Sir F. Leighton and Sir J. E. Millais, as he evidently did not see the little harmless joke therein. I think, however, the letter of Mr. Herbert S. Moberly—it is particularly worth noting that this gentleman is not an anonymous correspondent—in your last issue will furnish a better answer than any I can give, as I have not the honour of knowing either of these gentlemen except by their works. I may, however, draw attention to the fact that the acknowledgment of help is most complete, and also especially points out that the assistance of the photographs saved the absolute necessity of a considerable number of sittings. I feel extremely obliged for the testimony of Mr. H. S. Moberly, as it is a more than ordinarily valuable one. As a guide to colour those photographs would be useless, and therefore could only be a help to secure the outline and expression. I presume there is no one foolish enough to think that Sir F. Leighton needed such help; nevertheless he accepted it because circumstances dictated the advisability of such a course. No artist can possibly want the help of photography less for the sake of outline than Sir F. Leighton, as I think it is very generally conceded that probably no artist ever lived who had mastered all the details of the human form so completely.

"A Painter" finishes his letter with "The other remarks in Mr. R. Barrett's answer I consider as irrelevant, and do not care to reply to, and I think we have had now enough said about the question on both sides, so as to enable any impartial reader who cares for it to draw his own conclusion," &c. I fear I must disagree with him in this opinion, as I do in nearly every other that he has offered, although, I think, up to date the impartial readers are nearly all on my side. THE BRITISH JOURNAL OF PHOTOGRAPHY has a very large number of not only impartial readers, but close and attentive ones, and is read alike by artists as well as photographers; yet, strange to say, "A Painter" stands alone in taking exception to my remark as made in *Colouring as Applied to Photography*. The remarks in my answer which "A Painter" considers irrelevant, I maintain are not so, unless (which is possible) we have got different ideas as to the meaning of irrelevant. If "A Painter" did not wish to have the other portions of his second letter answered, he should have written across them, "Please take no notice of this—they are only passing remarks upon subjects of which I have but a slight knowledge." I would then have taken no notice of them. Besides, I do not expect a reply to what I wrote; what I did write was a reply to his remarks.

It is all very well to say that matter is irrelevant, but I beg to insist there was nothing of such a nature in my answer. If he refers to his letter, he will find I have only answered the points therein. It is evident that he does not hesitate to give strong opinions upon matters of which I feel sure he knows but little, judging by those given in his second letter to your JOURNAL. One should have good grounds beyond their own cramped opinion before taking to task any assertion authoritatively laid down. We are all liable at times to make mistakes, and I am always very grateful when any correspondent offers me advice, or differs from me in opinion, but I expect the same always to be backed up with somewhat more of common sense and knowledge of the subject than I have succeeded in finding in the letters of "A Painter." I begin to think now that the matter was a joke, and that I should never have taken it up seriously, but treated it like your correspondent, Mr. Herbert S. Moberly, to whom I once more offer my thanks for his independent testimony. Apologising for trespassing so much upon your valuable space, and thanking you for the same—I am, yours, &c.,

REDMOND BARNETT.

To the EDITORS.

GENTLEMEN,—In your JOURNAL of the 19th ult. (I am sorry now to say it) I rushed rather hastily into print. Since then I have made it my business to make inquiries as to the connexion between artists and photographers, and am quite astonished at the amount of work done for the former by the latter. I have gone in for the matter, and had it thoroughly explained to me, and I cannot find how a work suffers, as a work of art, by the help derived from photography, when legitimately used. I would not thus trouble you, but as I took exception to your correspondent's (Mr. R. Barrett) theory, which I thought incorrect at the time, I feel I owe him an apology now I find he was right in what he said. It will be a lesson to me in future not to offer an opinion on what I don't thoroughly understand.—I am, yours, &c.,

AN ARTIST.

St. John's Wood.

A CORRECTION.

To the EDITORS.

GENTLEMEN,—I wish to call your attention to an error that has crept into your last report of the proceedings of the North London Photographic Society, at which I am made to say I "only used two stops, namely,

$\frac{1}{17}$ and $\frac{1}{11}$." What I did say was, that "I thought two stops were sufficient for general work—No. 16 and No. 64 U. S."—which makes all the difference.—I am, yours, &c.,

EDWARD DUNMORE.

Beacon Hill, N., August 26, 1887.

Exchange Column.

- I will exchange a 12x10 rapid doublet lens by Burr for a half or whole-plate camera.—Address, C. BANTAM, Southwold, Suffolk.
- I will give a good Spanish mahogany stereoscopic camera, twin lenses, for half-plate instantograph.—Address, W. SAUNDERS, Dickleburgh, Soale.
- Will exchange magic lantern, three-inch condensers, for quarter-plate bellows camera and lens.—Address, H. COLES, Sunderland-terrace, Ulverston.
- Will exchange a magic lantern, fitted with solar lamp, four-inch condensers, and sixty slides, for a Lancaster's lens to cover 12x10.—Address, P. COSTA, Photographer, Southend-on-Sea.
- Wanted, pair of three-inch wide-angle symmetrical or rectilinear stereoscopic lenses in exchange for pair of longer focus or for cash.—Address, W. I. CHADWICK, Brooklands, Manchester.
- Changing box and dark slide by Ottwell, carries eighteen stereoscopic or quarter-plates; will exchange for half-plate view lens or for quarter-plate camera and lens.—Address, S. HALLON, Station-street, Lewes.
- Wanted, first-class half-plate camera (Middlemiss or McKellen preferred), three or more double slides, hot rolling press, ten-inch rolls; exchange, Rudge rotary tricycle.—Address, W. E. LEEK, 11, Tronmarket, Newcastle, Staffordshire.
- This year's American Annual and Mosaic for fifteen months' Camera; six-and-a-half-inch burnisher for quarter-plate lens; 18x12 white glass bath and dipper, cost 45s., for first-class retouching desk, graphoscope, or embossing press.—Address, C. C. VEYERS, Horsforth, Leeds.

Answers to Correspondents.

PHOTOGRAPH REGISTERED:—

E. J. HOLMES, Post Office, Cranbrook.—Combination group of buildings and Masters of Queen Elizabeth's Grammar School, Cranbrook.

R. A. A.—No.

C. J. GRIMMITT.—Hardwich's *Manual*, published by Churchill, London.

S. WELLS.—If Marien & Co. cannot supply what you require we do not know who can.

K. W.—No doubt the paper will be permanent enough if the toning, fixing, and washing operations are properly performed.

JAS. EDWARDS.—We have written to Mr. Crook respecting the Convention group taken at Edinburgh. He will doubtless reply in our next.

RUS.—1. Without seeing the lens we cannot supply any data for making alterations.—2. There are mats and rugs sold specially for the purpose.—3. Thanks for suggestion.

BARGO.—The stain is no doubt an iron one. If the alum and hydrochloric acid bath does not take it out we fear it is irremovable. Something must have been wrong otherwise the stain would not have been produced.

T. W. HEPBURN (Grahamstown).—The reference to the lens being aplanatic must only be held as meaning that it will define sharply in the centre of the plate only with full aperture. To extend the sharpness over a large area it must be well stopped down.

B. C. C. asks: "Can you tell me of any means of preventing prints cockling when drying?"—The best plan of avoiding the cockling is to dry the prints between blotting-paper or to place them where they will dry slowly. Rapid drying is almost sure to cause the pictures to cockle.

THE MOUNT (Ackworth).—The stain is doubtless caused by the paper having been exposed to light with part of it covered up—that part which is white. It would appear that it was the back which was exposed, and not the front. It is true that the stain can be partly removed by indiarubber, but only by abrading and removing the surface of the paper itself.

J. J. MACNAMARA.—It is difficult to account for the stains unless they are caused by the prints sticking together whilst they are in the fixing bath. If they were washed in an iron vessel which was oxidised, and they were allowed to rest on the bottom, this would cause a staining. The stain on the print sent is of a deeper colour than is usual with mere sulphuretted.

J. S. STRANKS writes: "Will you kindly inform me, in your paper, where I can obtain a ready prepared emulsion for dry plates?"—So far as we are aware, gelatine emulsion is not an article of commerce. No doubt if our correspondent required it in large quantities any dry plate maker would make it to his order. Collodion emulsion, we believe, is still supplied commercially. He might write to Messrs. Rouch & Co. or to Messrs. Wratten & Walnwright.

CORONIAN writes: "Will you kindly inform me, in your 'Answers to Correspondents,' how to dull silver and gold plate so as to be able to get a good photograph of same, and at same time not in any way to injure the plate? I think I saw a formula for same in the JOURNAL about five or six years ago, but am unable to find it now."—There are several different plans of producing a dull surface on plate. One is this:—After the subject has been arranged and focussed, and the plate is ready for exposure, a piece of ice is put into the vessels; this will reduce the temperature of the metal to such an extent as to cause the moisture in the atmosphere to condense on the surface and so dull it. Another plan is to dab over the surface with a piece of putty; this will destroy the gloss. After the photograph has been taken the putty can be brushed off with whiting.

C.—The design for your suggested camera appears to be very good for the purpose you require, while it is very simple. Any camera makers would construct you one. The lens you name, or one of a similar type, would be about the best you could take if you only take one. The shutter mentioned is also very good, but, as you say, cumbersome; you must not, however, expect to obtain every advantage without some slight drawback. A simple form of drop shutter would be more portable if slightly less efficient.

SILVER IODIDE.—1. You had better treat the bath the same as recommended to "W. H." in reply to query No. 1.—2. Better get price lists from makers of second or third-rate repute.—3. Unless we saw the negative we could not give a decided opinion. From your description the markings are somewhat different from those usually arising from imperfect washing between the intensifying operations. It would rather seem that the long continued washing had disturbed the gelatine film, and this might possibly be the case if the water had been unusually warm.

CRAYON inquires: "Would you kindly inform me if there is any work published on 'Facial Anatomy,' and if not, what is the best mode of studying it for retouching?"—We have placed this query in the hands of Mr. Redmond Barrett, who replies: "I have never come across such a work as 'Crayon' seems to require. There have been many works upon anatomy, which naturally includes the face, such as those by Fau, Flaxman (a standard work), Marshall, and Tinney, &c. As, however, he has everything in the negative at starting, and there is rarely a necessity to place the muscles but simply to modify the severity of their expression, I would advise the perusal of the articles which appeared in the JOURNAL some little time back under the heading of *The Art of Retouching*. I should think they would prove sufficient for his purpose. If not, however, I would advise taking a few lessons upon this special branch."

W. H. inquires: "1. How must I proceed to make a negative bath into a silver printing bath?—2. What strength ought a silver printing bath to be? and how long should paper float to yield vigorous prints?—3. Should printing bath be acid or alkaline?—4. What is the cause of the toning bath (acetate of soda) turning a magenta and then a deep purple colour? and what would remedy it?"—In reply: 1. If the bath has been but little used it will simply require making up to the proper strength; if it have been largely used proceed as follows, to get rid of the iodide:—To each pint of the solution add about six or eight grains of citric acid dissolved in water; next add liquor ammonia till the blue colour of reddened litmus paper is completely restored; now expose to a strong light for a day or two, then filter, and make the solution slightly acid with nitric acid, and then strengthen.—2. This will depend upon the amount of chloride in the paper; about fifty grains to the ounce is sufficient for most commercial paper. Two to three minutes will suffice.—3. Very faintly acid.—4. The discolouration of the bath arises from a reduction of the gold, owing to some extraneous cause, say, putting the solution in a dirty vessel, or contamination with hyposulphite of soda, &c. Keeping the solution in a strong light will also cause the gold to become reduced.

RECEIVED.—Mawson & Swan's Pocket Diaries for September and October.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, September 7, 1887, will be on *Dark Room Arrangements*. Saturday outing at Carshalton. Train from Victoria near two o'clock.

INDECENT PHOTOGRAPHS.—A hawker named Marcus Levy was charged in the City Police Court of Edinburgh with having offered for sale and exposed to view in his barrow at the Mound fourteen photographs of an indecent and obscene description. He pleaded not guilty. Mr. William M'Donald, agent, who defended, argued that, with the exception of four, the photographs were classical, such as would be seen in almost any print shop in the city. He produced in court two photographs purchased in two respectable shops on Thursday, and contended that they were worse than those seized by the police as indecent. When a man was charged with an offence of this kind it should be fairly shown that he had really committed an offence—that he stood out prominently from others who dealt in the same things as one who had grossly offended. He asked the Bailie to remember the nature of the figures exhibited in staine galleries. Bailie Walcot said that, altogether apart from the different positions in which the photographs were found on the barrow—some of them being loose, so that any one could see them, and others being in a box, to be shown if required—they naturally divided themselves into two classes. Some of them were nude figures—not all equally good, not all equally bad. Many of the photographs were certainly representations of easily recognised works of art, and to condemn them would involve the condemnation of the works of art themselves. He must say that there were some of them, however, he did not think could have come from the chisel of men who were moved by the highest motive or the highest principles of art; but he intended to put them aside—he did not object to them on the ground that they were nude. Four of them were essentially bad—things that no high-souled artist would produce, and things that no man who had the love of his fellow-creatures at heart would exhibit for sale, or purchase if offered for sale. Especially on the ground of these four photographs he found the charge proven, and fined Levy 14, the alternative being five days in prison.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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MOUNTING PHOTOGRAPHS IN OPTICAL CONTACT WITH GLASS.

FROM what has, from time to time, appeared in our columns in connexion with this subject, one might have surmised that it would now be fully understood. Such, however, does not appear to be the case with many, if we may judge from the correspondence we are continually receiving. Now the cementing of a print in optical contact with a glass plate is really a very simple thing, all that is necessary being to prevent air bubbles from getting imprisoned between the glass and the paper, and to expel all the superfluous adhesive medium, whatever that may be. Such is the process in the abstract.

With reference to the adhesive material, almost any may be employed—such as starch, gum, dextrine, or gelatine. On the whole, perhaps, the last named is the best and most convenient medium to use, and, for this reason, it is the one almost universally adopted. From correspondence received, we are quite aware that many have failed with gelatine, but, in most instances, we have been able to trace the trouble to one or other of a very few causes. These are usually the employment of gelatine of an unsuitable character, or using the solution too strong, or not warm enough, or, perhaps, from not expelling sufficient of the mountant after the print is brought into contact with the glass.

Let us now consider these little points in detail. First, the character of the gelatine. Some have assumed that a gelatine devoid of colour is an essential, otherwise the whites of the picture will be degraded. This is a fallacy, because, if the manipulations be properly carried out, the intervening film will be so attenuated that it will have no influence whatever on the print—unless, indeed, the very darkest glue were used, and even then it is somewhat doubtful. Most colourless gelatines, such, for example, as the foreign ones used for dry plates, have a rapid setting property, which is a very bad one for our present purpose, inasmuch as it increases the difficulties of manipulation considerably. Moreover, most of the foreign gelatines contain a certain amount of free acid, which may, with time, act injuriously on the mounted picture. A slow-setting gelatine—that is, one which might be considered, from a manufacturer's point of view, as of an inferior quality—should be chosen, even at the risk of its being somewhat coloured. With reference to the strength of the solution, many have met with trouble through using it stronger than necessary. A comparatively weak solution is far more adhesive than many would imagine. Regarding the temperature, if it be too low a difficulty will be experienced in removing the superfluous gelatine. The same remark will, of course, apply if the glass plate itself

is not made as warm as the solution. With these comments a novice should experience no difficulty in carrying out the following instructions without risk of failure.

The glass plates, which should be of good quality, and free from scratches and air bubbles, must be thoroughly cleaned, and the prints trimmed to a trifle less than the size of the glasses beforehand. Now four ounces of gelatine—that known as Nelson's No 2 Soluble is very suitable and nearly free from colour—are soaked and afterwards dissolved in a quart of water. The solution is then strained through fine muslin into a warm dish placed in a water bath over a small gas flame to keep up the temperature. The most convenient arrangement is to have a couple of enamelled iron dishes—such as those used by platinotype printers, one standing within the other—the outer containing the hot water and the inner the gelatine. The temperature should be maintained at 110° to 115° Fahr. Before commencing the mounting, the trimmed prints should be soaked in cold water, and then placed between blotting-paper to remove the excess. The glass plates should be made somewhat warmer than the gelatine before the fire, or by allowing them to remain for a time in tolerably hot water. When the latter plan is adopted—and it is the best, as by it dust is avoided—a squeegee must be passed over the plate, back and front, to remove the water, and thus prevent the gelatine becoming diluted.

A warmed glass is now immersed in the gelatine, together with a print, and allowed to remain for a short time for the solution to soak well into the paper. The two are then brought into contact and carefully removed, so as to avoid the formation of air bubbles. Then, with a soft rubber squeegee applied with some pressure to the back of the print, the superfluous gelatine is expelled as completely as possible. The plate is then placed aside to dry spontaneously. The most efficient method of using the squeegee is to commence the first stroke about two-thirds from the end of the plate, carrying it firmly forward to the other end. The second stroke should then be made in the reverse direction, but under similar conditions. By this means, should any air accidentally get between the paper and the glass, it will be effectually forced out. The tool can then be used with considerable force crosswise. Before the damped print is placed in the gelatine it should be dusted over with a soft handkerchief to remove any adherent fibres from the blotting-paper.

It is a good plan, after the prints have been squeegeed down, to pass the squeegee over the face of the glass, in order to remove the gelatine from that, so that there will be less to clean off after the picture is dry. Or the wet gelatine may be wiped off with a sponge moistened with warm water.

If a more brittle sample of gelatine than that recommended be used, or the mounted prints are likely to be subjected to an abnormal amount of dry heat, a very minute trace of glycerine may be mixed with the gelatine, but this will rarely be necessary.

NON-CHEMICAL FOG.

THAT the proportion of foggy negatives out of a given number produced is, nowadays, far larger than was the case when wet-plate pictures formed the staple product of the dark-room will, we apprehend, be denied by no photographer of experience. Whatever faults a negative might have possessed in those times, that of fogginess was the least common; for, whenever it was noticed that the chemicals had arrived at such a condition as to cause foggy pictures to be obtained, it was at once assumed that something was wrong, and a remedy sooner or later was generally found: we may say it was always tried for. But for a long while after the introduction of gelatine plates, a greater or less amount of fog grew to be looked upon as, if not a normal accompaniment of the process, at any rate a condition about which no trouble need be felt. The more so was this the case when of the many different varieties of fog it was found that some did not seem to injure the appearance of the finished print to any important, or, sometimes, even perceptible extent. There is far less tendency to fog in the plates which are now being sent out by the various makers; but while it is easy enough, even yet, to make foggy negatives with the best of plates, there are few expert workers who do not find fog presenting itself in one or other of the many batches of plates they buy in the course of a year.

This being the case, it is evident that the less experienced hand may come across instances of fog which he has no power of designating beyond suggesting that it is the plate that is at fault. A dozen years ago it would have been just the opposite; his first idea then would have been to examine his apparatus and his surroundings. It is therefore reasonable to suppose that there are many foggy negatives made by those whose only experience is dry-plate work, in which the defect is owing to causes other than chemical: lately, very many instances have been brought under our notice that have verified this supposition, and it may be of advantage here to discuss them. Our readers need not take alarm, and think that we are about to resuscitate any old controversies; there are plenty of indisputable facts without introducing polemics. Dark-room work strongly reminds us of the old saying, "What is one man's food is another's poison;" for, in regard to a question of illumination, a light that is safe to a plate in one position would ruin it when differently situated.

The lighting of a dark room is almost entirely a matter of degree, and when one person copies the exact colour of the light screen in a friend's laboratory, where are produced negatives of perfect brilliancy, he may quite easily go wrong, and obtain only foggy pictures unless the other conditions go hand in hand with the original. If he should be so unlucky, it will, in all probability, be long before he finds out the real cause. A certain professional photographer of some standing had many of his negatives slightly fogged through no other cause than the lighting arrangements of his dark room, although this subject was one he had experimented with to a considerable extent previously to his selection of a colour screen, and the mode and place of fixing it. It was a pure accident that led to his discovery of the extent to which his screens were defective.

On one occasion he had a negative of a particularly interesting subject which he was anxious to get through without one moment's loss of time. He made his exposure on a plate backed with coloured collodion, and, as this was of a very tenacious sort, he did not wait to remove it before development, but placed the collodionised plate at once in the solution. A long development was required, and many times during its course he held the plate up to the coloured window to see how the picture was progressing, and to facilitate his examination he rubbed away the coloured collodion from just behind the face. When the picture came to be closely examined after fixation he was dismayed to find a distinct, though slight, fog upon the face. A rigid examination was made, and the fact was clearly shown that the plate in its various examinations had, in the aggregate, received sufficient light to cause fog, though exposure at the ordinary distance during prolonged development caused no fog. Hence in his everyday work some plates were injured and others not, according to the frequency with which they had been examined. For the future this gentleman changed his screen, or, rather, he added another thickness of yellower glass, and this sufficed to prevent danger under anything approaching to average conditions.

Another professional photographer of our acquaintance, also in a large way of business, built himself a new dark room, glazing it with glass exactly similar to that made use of in his old room, with the one exception that there was a much greater area of it in the new place. Here, again, fog trouble arose, and it was not discovered for some little time that the cause was the different conditions under which the light screen hitherto found to be perfectly safe had been used. Now these two instances occurred with professional photographers expert at their work; how much more easy must it not be supposed to be for the amateur with small experience to fall into errors of a like nature, and then to imagine that the fault lay with his plates?

It is not long ago that we were giving a little friendly help to an amateur who showed considerable aptitude in learning, but whom the fog demon had overtaken, as he said. His dark-room lantern we found to be not light-tight at the edges, and, at the same time, the one pane of glass was not sufficiently opaque to the more active rays. These faults were remedied with advantage to the negatives; but still there was fog. We gave him of our own plates, which we knew to be good; but, still fog. We carefully scrutinised his camera, but found no light hole, not even the most minute. A little surprised at our non-success, we took up the lens and at once saw where the trouble lay. At the back part of the mounting there was a flat band of polished metal—blackened it is true, but still possessing a polished surface, and capable of reflecting such an immense amount of light that it would have been a marvel if the plate had not been fogged. A piece of black velvet ribbon pasted over the reflecting rim entirely prevented any further trouble from this source.

We will conclude by pointing out a cause of fog which at times a large number of photographers have suffered from. We allude to the reflection, from the inner portion of the lens mount, of light received from the sky or clouds. If the camera be pointed at a view which embraces a considerable stretch of sky, it is absolutely necessary that the lens be screened with a shade of some kind. This need not be a permanent screen—a piece of cloth or velvet, a coat-sleeve, or, handiest of all, perhaps, a hat, will suffice; but it is imperative that the glare of the sky be not permitted to enter the lens. We

have seen such a very large number of negatives, otherwise most satisfactory, spoiled by this one cause only, that if our remarks but compel attention to be given to this subject alone they will have served a most excellent purpose.

PYROGALLIC ACID AND ITS PRESERVATION.

In former days when pyrogallie acid as a developing agent was almost invariably employed in a state of acidity, little or no trouble was experienced in its preservation, since, though the acid solution was known not to retain its developing energy for any lengthened period, it was an easy matter to make up a sufficient quantity to supply the day's requirements without incurring the trouble of repeated weighings of minute quantities for each plate developed. When, however, the alkaline method was introduced the circumstances were changed, and it became necessary to devise some means by which the pyro could be preserved in solution, or else to weigh out the quantity required for each operation, though the somewhat slipshod method crept into vogue of guessing at the quantity.

The earliest and at one time the almost universal plan adopted by dry-plate workers was to keep the pyro in concentrated alcoholic solution, the tendency to oxidation in that state being infinitely less than in aqueous solution. Accordingly a ninety-six grain solution in pure alcohol or rectified spirit became most commonly used, five minims representing one grain, though many preferred as more convenient a sixty grain solution, eight minims of which represented a grain, and so, greatly facilitated calculation in mixing the developer, since one minim to each drachm of developer formed a one-grain-to-the-ounce developer. Kept in this manner the solution retained its developing power for very long periods, and though it gradually darkened with time, the result appeared to be little detrimental to its subsequent action.

It is true there were periodical outcries against the employment of the discoloured solution, and sinister warnings of the dangers and uncertainties attending the practice, but we are not aware that they produced any great effect; however, to soothe the minds of those who disliked the change of colour, the method was published in a leading article in this JOURNAL some ten or twelve years ago of dissolving a minute quantity of citric acid in the alcohol, in order to still further arrest the oxidation and consequent discolouration of the pyro. The latter, though always prone to oxidation when in solution, especially in the presence of water, only exhibits a violent attraction for oxygen when it is rendered alkaline, in which condition it is one of the most powerful oxygen absorbents known. In rendering it very faintly acid its tendency to deterioration was thus arrested, and the publication referred to was, so far as we know, the first recognition of the use of acid for the special purpose.

With the advent of gelatine plates the necessity of preserving the pyro in solution was in more ways than one forced upon the notice of photographers. The large class of wet-plate workers who joined the ranks of gelatine had been accustomed to prepare their developer in quantity, and the practice of mixing it fresh for each plate not only proved irksome, but if the dry pyro had to be weighed out each time, was a practical impossibility in a busy establishment. The alcoholic solution, if it was ever tried by the ex-wet-plate workers, found little favour, as was only to be expected, for the quantity of alcohol thus introduced into the developer, small though it may be, causes it to flow on the gelatine surface in a "greasy" and semi-repellent manner, which they had been accustomed to accept

as a warning that the bath was out of order and required boiling to free it from excess of ether and alcohol.

The first step towards a preserved pyro solution for gelatine plates was made, we believe, in 1879 by a Mr. Barker, who published his formula in a letter in these columns; it consisted of the addition to the pyro solution of a minute quantity of nitric acid. This innovation at first gave rise to a considerable amount of comment amongst those who failed to see its object, though eventually it came to be recognised that though the acid was neutralised and rendered practically inert before the pyro was applied to the plate, still it had performed its function in preserving the pyrogallie solution in working order. Subsequently, Mr. A. Cowan published a formula in which citric acid played the part of preservative, and this, as well as the nitric acid method, are still adopted in many studios.

The next method was Mr. Herbert B. Berkeley's application of sulphite of sodium, and the commercial supply by the Platinotype Company of "sulpho-pyrogallol," or a solution of pyrogallol and sodium sulphite rendered acid. Some ten or eleven years ago, when experimenting with the late M. Sammann's "hydrosulphite developer," we noticed and commented upon the peculiar manner in which sodium sulphite, but more particularly the hydrosulphite, preserved the clearness of the pyro developer, even in its diluted state as used, the solution, after several hours' exposure to the atmosphere in a dish, acquiring only a clear pinkish-brown colouration, free from any of the muddiness so usual with ordinary alkaline pyro. But it was Mr. Berkeley who first called attention to the special value of sodium sulphite in connexion with gelatine plates; and though his recommendation escaped general notice for some little time, owing to the fact, no doubt, that the public failed to recognise its special usefulness, it is scarcely too much to say that at the present day nine out of ten photographers use sulphite.

Here it may be as well to point out where the difference arises between the use of acids and of sulphite of soda. As we have already mentioned, the acid is neutralised upon the addition of the alkali of the developer, and thenceforward becomes inert, or practically so, its only function, if any, being that of a restrainer. The acid, in fact, behaves purely and simply as a preservative of the stock solution of pyro, its functions in that direction ceasing directly the developer is mixed; consequently, however well the stock solution may keep, the mixed developer discolours as rapidly and as completely as if no acid had been employed. Hence, in a case of prolonged development, or, indeed, under any circumstances, the gelatine film becomes more or less stained by the formation within its pores of an insoluble deposit of oxidised pyro, which necessitates the subsequent application of an acid clearing solution to remove it, or at least to render it less obnoxious.

But with sulphite of soda the case is different; not only does it act as a perfect preservative of the pyro in stock solution, but after mixing with the alkali it still continues to exert its influence in counteracting the staining power of the developer. Though in the diluted state and in the presence of alkali it does not arrest the discolouration of the solution, it keeps the latter clear by preventing the formation of the insoluble deposit that in its absence is formed and constitutes the stain. Thus, except in the case of a very prolonged application, the film only requires a thorough washing to free it from any tendency to abnormal colouration instead of having to be treated with a special clearing solution.

Though, as has been said, the great majority of photographers now use sulphite, there are still those who deery its virtues and deny its efficacy or even attribute to it counter-valuing defects which they hold should forbid its use. Only a few weeks ago a statement was made at a provincial meeting to the effect that sulpho-pyrogallol is "uncertain." This we are prepared to contradict in the most unqualified manner provided the solution has been properly made at first. We are led to say this from the fact of having a few months ago used up a quantity of pyro solution preserved with sulphite of soda which had been made *upwards of five years*, yet which showed no loss of vigour nor any difference in behaviour from a solution newly made by the same formula. The colour had become rather dark, but that fault existed to a slight degree when it was freshly mixed, and the deepening of the tint was far less than would have been anticipated in the time mentioned, while the entire absence of any deposit or sediment argued well for the efficacy of the preservative.

A considerable amount of divergence of opinion is expressed as to whether the addition of sodium sulphite has any effect in retarding development. Much of this discrepancy arises, we are convinced, either from the employment of a bad sample of the sulphite or else from a defective method of employing it. Complaints are also heard of the discolouration of the solution even when fresh, but here again the fault lies with the operator rather than with the method. We have given a large amount of attention to the subject for many years past, and we are prepared to say that if the discolouration which is complained of is a great objection, a solution of pyro may be, if desired, kept for months, perhaps years, practically without the slightest discolouration or deterioration.

Nothing need be said regarding the use of bad sulphite, that is a fault for which there is now not the slightest excuse, as the proper article is readily obtained from any photographic chemist. But even in using the purest and best samples errors and discrepancies may arise. For instance, in the matter of colouration there is a right way as well as a wrong of mixing the solution. The so-called neutral samples are usually slightly alkaline, and directions have been over and over again given to neutralise the alkalinity *before* dissolving the pyro. If this be neglected, or even if it be done *after* dissolving the pyro, then it is not to be wondered at if some slight discolouration occur between the latter and the alkali, whereas, if directions were carefully followed, not the slightest discolouration in the sense of the term need take place. A pale, bright yellow tinge, such as many colourless salts take in solution, can scarcely be described as discolouration, which, as applied to pyro, is usually implied to mean a brown or black hue. If the solution be originally of the clear straw tint, it is not likely to further change.

With regard to the alleged slowing of development, it may chance that the charge is well founded, but not as against the sulphite itself. Thus, in his earlier instructions—and others have since followed him—Mr. Berkeley directed that the sulphite be neutralised with citric acid. Now, as we are all aware, the citrates *are* powerful retarders, so that we can readily imagine that sulphite of soda *plus* citrate of soda may retard the developer to an appreciable extent, when if some other acid—preferably sulphurous itself—had been used, no such effect would have occurred.

It is very easy to introduce complications and uncertainties into any process, but in this respect the method of mixing sulpho-pyrogallol appears to have been specially blessed, though

we think unnecessarily. But by attention to the principles upon which the "sulphite developer" is based, a perfectly reliable and unretarded preparation can undoubtedly be made.

THE Merchandise Marks Act is "An Act to consolidate and amend the law relating to Fraudulent Marks on Merchandise," to which the Royal assent has been given, has just been printed, and may now be obtained from the Queen's printers for twopence by any one who takes an interest in the matter, photographically or otherwise. The Act has been framed more especially with a view of checking a fraud upon certain British manufacturers, which for a long time has existed. It is the well-known custom of some foreign manufacturers to make up goods—textile fabrics in particular—in imitation of those made here, and sending them over to this country. Against this nothing can well be said. But they have also affixed to them the trade marks, and sometimes the actual names, of English makers for the purpose of enhancing their value, especially when the goods are for exportation. There is a special clause in the Act relating to watches, which may possibly apply to photographic lenses. It has of late years been very common for English watchmakers, or dealers, to purchase the movements abroad and to fit them into English-made cases, or in foreign ones bearing the English hall mark, and selling them as watches of English manufacture. When the new Act takes effect this practice will become illegal.

THE Act is very stringently worded, and the penalties under it are heavy. On summary conviction, for the first offence the fine is limited to twenty pounds, or in the case of imprisonment to a period of four months, and for the second offence the fine may be fifty pounds or the imprisonment six months. On conviction on an indictment the punishment may be both fine and imprisonment, the latter, in this case, being limited to two years. In cases of conviction the fraudulent goods become forfeited to the Crown.

ON the whole there is very little in the Act which is likely to affect photographers or photographic dealers. One of the clauses which is perhaps the most important to them is Clause 16, which reads as follows:—

"Whereas it is expedient to make further provision for prohibiting the importation of goods which, if sold, would be liable to forfeiture under this Act; be it therefore enacted as follows: (1). All such goods, and also all goods of foreign manufacture bearing any name or trade mark being, or purporting to be, the name or trade mark of any manufacturer, dealer, or trader in the United Kingdom, unless such name or trade mark is accompanied by a definite indication of the country in which the goods were made or produced, are hereby prohibited to be imported into the United Kingdom, and, subject to the provisions of this section, shall be included among goods prohibited to be imported as if they were specified in Section 42 of the Customs Consolidation Act of 1876."

From this we presume the Customs authorities will prohibit the importation of foreign lenses when they bear the names of English dealers, unless they also have on them the name of the country in which they are made. This, however, we imagine, will make but little difference, as most purchasers of lenses bearing dealers' names only know quite well that they are mostly made on the Continent, and that the dealer has merely selected them, and that he is responsible for their quality. An intimation on the mount that the lens was made abroad will not detract from its utility.

A CONSIDERABLE quantity of material used by photographers is imported into this country and sold by many dealers as being of English manufacture, at an enhanced price over what it would make if it were sold as of foreign make. Amongst such things may be enumerated albumenised paper, pyrogallol acid, and hyposulphite of soda. Under the new Act this procedure will be rendered illegal.

EVIDENTLY some photographers do not look upon faded photographs as being at all against their reputation. Some time ago we saw, on the barrow of a street hawker, a large number of very much faded portraits of celebrities, and bearing the name of a well-known London

house. These the man was offering for sale at a penny and twopence each. One might have surmised that it would have paid the photographer better, for the credit of the firm, to have destroyed these pictures rather than sold them for the trifling sum which they could possibly have obtained for them of the itinerant vender. Such, however, does not appear to have been the case in this instance.

It is curious to note to what extent the demand photography has created for certain commodities has had in materially influencing their price as well as their quality. Opal glass is a notable example. Only a few years back this could scarcely be considered as an article of commerce, indeed the pot metal variety—for which at that time there was little or no use—could only be obtained from one or perhaps two sources, and then only at prices which were almost prohibitive. Now, however, the demand for it is so great and competition so keen, that its present price is little more than as many pence per square foot as it formerly was shillings. At the same time that the price has been so much reduced, its quality has been considerably improved. Opal glass is now used for many purposes other than photography. Pyrogallie acid is another instance. At the time that photography created a demand for this article it was little more than a chemical curiosity, and its price was enormous. At the present time a pound of "pyro" can be had for less than once had to be paid for half an ounce, and of far better quality. The uses of pyrogallie acid is now confined entirely to photography.

MORE brilliant negatives might often be obtained if operators paid greater attention to the condition of the interior of their cameras—studio cameras, which are in constant use, in particular. By frequent dusting the black coating gets rubbed off, or the wood to some extent becomes polished. Consequently the light from the lens, which falls on the sides of the camera, instead of being absorbed is reflected and diffused, and much of it reaches the plate. Although, of course, this diffused light is exceedingly feeble, it is yet often sufficient, with a very sensitive plate, to have a marked effect on the brilliancy of the negative. If all studio cameras were lined with black velvet, instead of being, as they frequently are, imperfectly blacked, or partially polished, on the inside, it would tend towards a great improvement in the quality of the negatives. We would here bespeak special attention to our leading article on *Non-Chemical Fog* as bearing on this subject.

A VISIT TO THE ORDNANCE SURVEY OFFICE, SOUTHAMPTON.*

THE negative being finished, the next operation is that of obtaining from it an image in fatty ink, and afterwards transferring that to a zinc plate for printing from in a lithographic press. We shall now follow these operations through. Paper, of the bank post type, is coated with a solution of gelatine and bichromate of potash, and dried, of course, in the dark. The paper is then exposed behind the negative in an ordinary printing frame, until a distinct image is apparent. The exposure is made out of doors, preferably to sunlight, but diffused light is frequently employed. In winter, or when the light is very bad, the exposure is made to the electric light. The operators do not examine the prints, as experience has taught them to judge, from the appearance of the exposed edges of the paper, when they are sufficiently printed. In bright sunshine the exposure required is very brief, indeed then the operators usually wait beside the frame till the print is done. The paper being printed, the next operation is to coat it evenly with a fatty ink. This is done in the following manner:—

A zinc plate, or a lithographic stone—the former is used here—is evenly inked up with transfer ink thinned with turpentine, a leather roller being used for the purpose. The exposed paper is now laid face downwards on the inked surface, and the whole passed through a lithographic press several times, care being taken that the pressure is evenly distributed. By this means a more uniform coating of ink is secured than could be obtained by any other method. The image now requires developing. For this purpose it is taken back to the room where the paper was originally prepared, and floated face upwards

on water at a temperature of about 90° Fahr. After a time the unacted upon gelatine becomes softened and swells up; the print is then removed and laid face upward on a metal plate. Then the inked surface is carefully sponged over with a soft sponge, under a stream of tolerably warm water. This treatment removes the ink and the gelatine from all those portions which have not been acted upon by light, leaving the lines sharp and clear on a white or faint yellow ground. After the print has been fully developed it is well washed in cold water to remove all remaining traces of the unaltered bichromate, and then dried. It is now ready for transferring to the zinc plate, or to a lithographic stone, for the operation would be the same in either case.

At Southampton, however, stone is not used, the maps all being printed from zinc. The advantage of zinc over stone is very great, as all the plates are preserved—and they must number many thousands—it will be seen that, if stone were used, the immense amount of space it would occupy, to say nothing of its enormous weight. A large zinc plate weighs something like half a hundredweight, but a stone, the same size, would weigh three or four hundredweight. The stone would also cost six or eight times the price of the zinc.

The plates used are the eighth of an inch, or a little more, in thickness, and are all prepared on the premises. The zinc is of the Veille Montagne brand, which is found to be the best for the purpose. The plates are first of all well scraped with a tool made from a razor blade to take off the scale and any deep oxidation. They are then scrubbed down with pumice-stone and water, and afterwards smoothed with snake-stone; they are then ready for either polishing or graining. For general purposes grained plates are used. The grained surface is produced by grinding it with fine sand and a zinc muller.

The image in the fatty ink is transferred to the zinc in the following manner. The plate is placed on the bed of a lithographic press, and the transfer put between sheets of clean damp paper. While the transfer is moistening—for it must be borne in mind that while it is dry it is somewhat smaller than the finished map is to be—it is carefully gauged from time to time, and as soon as the expansion of the paper has reached the proper dimensions of the map it is at once laid, face downward, on the zinc, two or three sheets of paper are placed over it, and the whole is then passed several times through the press to "set off" the ink. Next the back of the transfer is sponged over with water, when, after soaking for a short time, the paper can be stripped off, leaving the ink upon the plate. It is now washed with water to remove any adherent fibres of paper, and dried. Next it is treated with a mixture of gum water, decoction of nut galls, and phosphoric acid, applied with a broad camel-hair brush. After resting for a few seconds, this is washed off. Now the surface is treated with turpentine to remove the transfer ink, and the plate is then ready for inking-up with ordinary ink and printing from by the usual method of zincographic printing. This, it is scarcely necessary to explain, is analogous to that of lithography—the zinc plate being merely a substitute for stone.

The printing, after the plates have been proved, is for the most part done in a gigantic litho machine by Furnivall—the largest size yet made. It runs at great speed, and prints two of the largest plates at a time. It is, as a matter of course, driven by a powerful steam engine. In the zincographic department, where this machine is, there is an immense rolling press for surfacing and glazing the paper; the rollers are nearly four feet long, and about eighteen or twenty inches in diameter. Also, there is a guillotine cutting machine, on a similar scale, for cutting the paper to the different sizes. This machine, as well as the rolling press, is, of course, worked by steam power. The plates, after they have been printed from, are stored away in racks formed of two grooved shelves, and enclosed with doors as a further protection. In front of the bottom shelf is fitted an iron anti-friction roller, which takes the weight of the plate while it is being placed in or is removed from the rack.

It was mentioned at the commencement of this article that all the different scales upon which the maps are issued are produced from one original drawing. Now a little consideration will show that if, say, the ten-foot scale were reduced to one inch, the roads, paths, and the more minute of the details—the names, &c., would be too small to be clearly distinguishable. Therefore it is necessary that they should be somewhat exaggerated in the smaller scales. The plan by

* Concluded from page 548.

which this is accomplished is most ingenious. It is known as the "blue process." A print on the larger scale is taken from the zinc plate in a very faint blue ink. Then the lines are traced much bolder in a strong black ink, and the roads and paths made broader. This is done by drawing them in with a ruling-pen, keeping some little distance outside the lines of the original. The artists who do this work are furnished with coloured plans to indicate the class of roads they have to deal with: thus, one colour represents a high road, another a by-lane, a third a footpath, and so on. The names are also put in on a larger scale; in fact, the map is entirely reproduced with the finer details on a bolder scale generally, the blue print serving as a guide to accuracy. Much of this work is little more than mechanical, and requires comparatively but a small amount of skill to carry it out. For example, the names are printed in from type fixed in small holders, and houses and trees are put in by similar means. To explain all the ingenious contrivances and dodges resorted to in this department would take far more space than can be afforded. When the map is finished it is copied in the camera to the scale required, and as the light blue ink has about the same relative photographic value as the paper itself, this impression does not show in the finished negative.

Many of the maps are produced from engraved copperplates; indeed, the copperplate department is one of the most important in the establishment. Here some of the work is executed by etching, and some with the graver, but by whichever plan it is done it is a tedious and slow operation. Some of the larger plates, with the hills shaded, which are very full of detail, take as much as a couple of years, or more, to complete. In the hill-shaded maps the hills are first drawn in by artists on prints from the ordinary outline plate. In this work air brushes are now extensively employed, and very skilful the artists have become with them. Air brushes are also used for working direct on the copperplate as well as on the negative at times. At Southampton this useful apparatus is highly spoken of as a time saver. Although many of the maps are engraved, they are actually printed from zinc—the copperplates being used only to produce prints, which are afterwards transferred to zinc, from which the impressions issued are obtained.

The electrotyping department is an extensive one, and is most complete in every way. Here the copperplates are reproduced and other electrotyping work executed. The source of electricity is a Crompton dynamo machine, which is driven direct by a Williams's quick-speed engine. The dynamo has been specially constructed so that it can be used either for depositing or for lighting. When used for the former purpose it is run at a speed of about four hundred and thirty revolutions per minute. At this speed it will yield a current with the necessary electro motive force for the purpose required. From the room in which the engine and dynamo are situated we enter the depositing room. Here are about thirty troughs, each capable of taking the largest size plates, which measure thirty-eight inches by twenty-four. They are strongly made wooden vessels; some are lined with different waterproof cements, and some with lead. Several cements have been tried, but up to the present time lead has proved the most efficient for preventing leakage. The troughs are all mounted on pivots, and are kept continually rocking to and fro by a mechanical arrangement actuated by the same engine that drives the dynamo. The object of the rocking motion is to keep the solution slightly agitated and of uniform density, so as to ensure the deposited copper being of the same character throughout its thickness. The copper is deposited with the plates placed horizontally, the cathode, or reproduced plate, being uppermost, and the anode being below. By this means a more uniform deposition is obtained than when the plates are arranged vertically. So evenly, indeed, is the copper deposited here that many of the plates may be printed from direct without requiring the backs to be filed up to make them smooth. I saw several plates separated from the matrix and they were all of them most perfect both as regards uniformity and excellence of metal. The Waterhouse process is also in use here. In the depositing room is a milling machine of the latest type for rapidly trimming up the edges of the plates, so as to avoid the laborious method by filing. In a separate apartment are very complete appliances for testing the force and quantity of the electric current and for regulating them according to the work in hand, also for testing the quality of the deposited copper.

The electric light is in use at the Survey Office, the arc light being employed for printing the transfers from the negatives in dull weather and the incandescent light for illuminating some of the workrooms where daylight fails, the current for the latter being taken from a series of secondary batteries charged by a dynamo.

To give anything like a full description of the operations carried out at the Southampton establishment—or even to briefly allude to all their ramifications—would occupy far more space than is at my disposal. However, I have endeavoured to give some general idea of those most interesting to the photographic reader.

In concluding this notice I must express my appreciation of the extreme courtesy I met with from all associated with the establishment, and thank those gentlemen for the great pains and trouble they took to explain all connected with their different departments.

STEREOSCOPIC PHOTOGRAPHY AND ITS REVIVAL.

THERE has been latterly an apparent tendency in many quarters to return to the practice of stereoscopic work, which twenty years ago formed so prominent a branch of the amateur photographer's pastime; and I cannot help thinking this is as it should be, for a more charming class of picture than the stereoscopic, when properly executed, it is difficult to conceive. Small single pictures have their advantages, inasmuch as their production entails comparatively little labour, but their mean dimensions render them of little value when finished, for they are too small to frame and scarcely worth the trouble of mounting in a scrap-book. On the other hand, large pictures entail heavy and costly apparatus, to say nothing of the labour or cost of its transport, while there is a limit always to one's available wall-space, and pictures buried in portfolios cease to present much interest after one or two inspections.

But a well-executed stereoscopic slide is an entirely different thing; it necessitates no heavy nor expensive apparatus, while it may be made a "thing of beauty" and "a joy," if not "for ever," "for nearly ever," to parody Gilbert. The pleasure derivable in fact from the stereoscope extends far beyond the mere pictorial interest of the scenes depicted; they will bear examination and re-examination, new forms and combinations coming into relief constantly that pass unnoticed in the flat single picture. I am the possessor of a bundle of stereoscopic views, the production of myself and friends a quarter of a century ago, and though they have little that is attractive in their general appearance, being worn and shabby, and many of them having passed into the "sere and yellow," I can periodically derive an amount of real pleasure from going through those dilapidated old slides that all the exhibitions of the highest class of modern work would fail even to suggest. There may be some sentiment in the matter but it is not all so; the thoughts may fly back to friends who are gone, or to scenes that may never be re-enacted, but still the pictures themselves, as pictures, claim an amount of attention that has often set me promising that "next season I will go into stereo work again." Next season, alas! never comes; it is next *and* next, and I well remember that my last and really most practical attempt to revive the old love resulted in *four* stereoscopic pictures out of a season's work.

It is the custom to speak and write of the decadence of the stereoscope and of stereoscopic photography being due to the defective instruments and trashy and ill-executed pictures with which the market was at one time flooded. This has never appeared to me a reasonable explanation of the almost total neglect which has fallen upon "stereoscopy," for there were good and well-constructed instruments as there were choice subjects and properly mounted slides; the disease could certainly not spread by infection or contagion from the worthless ones. I can readily understand the lay public growing disgusted with the horrible productions of so-called art that used to be considered good enough to go with the stereoscope—inane and impossible groupings of frowsy French and German women, got up to represent glimpses of a home-life that the artist was an utter stranger to, or ridiculous attempts at comic scenes frequently conceived in the worst of taste. Then to find that after spending a quarter of an hour in looking into the stereoscope you contracted a violent headache and what promised to be a permanent squint, was not calculated to put anybody violently in love with an instrument which, however beauti-

ful it might be in theory, was certainly not conveniently or comfortably practical.

So far as the mere decline of the stereoscope in popular favour is concerned, I am ready to agree that it may have arisen from the causes stated; but as regards stereoscopic photography, I set the change down entirely to mere caprice, fashion, change of ideas—call it what you will. Those who formerly practised stereoscopic work got tired of it, went in for larger plates, or gave up photography altogether. Example is a great thing, and as one after another of the old practitioners dropped it, still others followed suit, and the newcomers had none to lead them into paths stereoscopic. In like manner I am firmly of opinion that it only requires somebody to make really and practically a fresh start in that direction, to let his stereo-camera be seen at some of the outdoor meetings, and his results at the indoor gatherings. I say it only wants the proper start to bring our old friend into greater favour than ever. What the practice of stereoscopic photography might become to-day as compared with twenty years ago can scarcely be realised in a moment, but at any rate the existing conditions are altogether favourable to its revival.

In the event of such revival we shall have practically the resuscitation of a lapsed industry, that of the manufacture of stereoscopes. Let us hope it will be conducted on more scientific lines than formerly, and let us further hope that during the years it has lain dormant the majority of the "old stock" may have disappeared both from "private life" and from the shelves of the dealers. This, I am afraid, is too much to be hoped, for we are nearly certain to find that, Rip Van Winkle-like, the manufacturers will wake up, if not with the identical old stock, at least with the same old patterns. If one of our leading societies would appoint a committee to report on the subject a type of instrument might easily be settled upon to form a standard, so to say, to which all respectable opticians would be glad to work; but so long as the matter is left in the hands of the "shopkeepers" there is little hope of improvement. I should imagine that in London, at any rate, if not in most of our large cities, there might be found a sufficient number of photographic amateurs interested in the stereoscope to undertake its revival by the formation of a club or society specially devoted to the production of stereoscopic work and to the improvement of the means and appliances thereto.

With regard to the stereoscope itself it is by no means a necessary condition to the production of a satisfactory instrument that it be an expensive one. One of the most convenient, and certainly the most comfortable of instruments I ever employed was one of the cheap folding description that cost me I think about half-a-crown. This I invariably used when mounting my slides, and for comfort, definition, and good stereoscopic effect it compared very favourably with a more pretentious instrument kept for "show" purposes, and still in existence, and which cost more pounds than the other did shillings. This, moreover, in spite of the fact that the lenses were simple double convex crown, while those of its aristocratic rival were duly achromatised. The latter instrument is not one that I should describe as a downright bad one, but it possesses certain defects, in common with most of even the best, that might easily be avoided.

It is of the usual conical-bodied box form, with silvered glass lifting reflector, and with screw arrangement for focussing. I have nothing whatever to say against the form of instrument, which, if properly constructed, may be without fault; but they very seldom are so constructed. In the one in question, for instance, as in almost every one of the class I ever met with, the reflector is ridiculously inadequate to the task of lighting the whole of the slide—I am speaking now, of course, of paper prints. Even when used directly and squarely opposite a window and close to it, in its best position, the reflector casts a curtain of shadow down either side of the picture, though the centre is well lit; but if, as very often happens, the side of the stereoscope is partially or wholly towards the light it is scarcely possible to see the picture, certainly with comfort.

This is an easily remediable defect, and one which I class amongst those of carelessness and ignorance on the part of the maker rather than as one of form. For instance, the body of the instrument I speak of is seven inches wide at its broadest part, *i.e.*, where the slide is inserted, but the hinged wooden lid carrying the reflector leaves a margin of three-quarters of an inch at each side, or is an inch and a half shorter. The silvered glass reflector, however, is shorter still,

measuring at its widest part (for it, too, is shaped like the body of the instrument) four and a half inches, and at its narrowest three and three-quarters. Now, as the combined width of the two halves of a stereoscopic picture may be taken as six inches, it is difficult to see how a plane reflector of less than four inches can satisfactorily illuminate it. It is true that the left-hand side of one half and the right-hand side of the other are shaded, while the opposite sides are lighted, and that so the whole of the combined picture is more or less illuminated; but the difference between the centre and the edges is so great as to be positively disagreeable.

Now, if instead of so curtailing the size of the hinged flap—which, by the way, adds nothing to the neatness or ornamentation of the instrument—it had been carried to the extreme width of the framework, nothing more would have been needed, and my just cause of complaint would not have been written down. The instrument then would have been perfect, so far as lighting is concerned, for either paper or glass slides. In connexion with this question of lighting I may mention that a friend of mine some years ago had his stereoscope altered by cutting away the posterior part of the sides of the framework between the hinge of the reflector and the ground-glass back, leaving that portion of the instrument entirely open. This was a great assistance in lighting a paper slide, especially when sitting sideways to the light, but it almost ruined the instrument for transparencies, in order to satisfactorily view which it was necessary to cover the side openings with the hands.

Going from the body of the instrument to the lenses, these are, as I have said, achromatic, carefully matched and properly mounted, being provided with screw arrangement for focussing. This, I consider, quite sufficient, though some stereoscopes have an adjustment for altering the distance of the lenses apart. Considering that we have to deal with lenses of an inch and a quarter, or an inch and a half in diameter, this seems to me entirely superfluous, for if the lenses are set at a medium distance, say three inches between centre and centre, quite sufficient margin is allowed to suit eyes set at widely varying distances, as it is not absolutely requisite that the centre of the lens should be used. Three inches is a proper distance, as it places the lenses about opposite the centres of the two pictures; if that position be departed from to any great extent, one or other extremity of the picture gets beyond the range of comfortable vision.

So far for the principles of construction, and now for the defects of carelessness. The lenses are an inch and a quarter in diameter, and are mounted in tubes of an inch and a half diameter which slide in a pair of collars for focussing purposes. This necessitates a considerable length of tube, in this instance an inch and a half of clear slide, or a total length from the ornamental exterior eye-pieces of two inches and three-eighths, the lenses being fixed about midway. Now it results from this great length of tube that a large portion of the margin of each picture is cut off; this causes an uncomfortable and hazy idea that there is something floating in mid-air between the eye and the picture, and further if the attention be given to any objects at the edge of the picture they are indistinctly defined and devoid of stereoscopic relief. If one eye be closed it will be found that the circular tube cuts off the whole of the margin of each picture, but not symmetrically, that is to say, the same amount of subject is not shut off from each half; consequently in the combined picture a great portion of it is seen only by one eye, the centre being stereoscopic, but perhaps the greater portion being flat, indistinct, and in semi-darkness.

If the focussing adjustment is to be dependent upon sliding tubes, then these tubes should be of sufficient width in proportion to their length to prevent any portion of either image being cut off from the eye. But I greatly prefer a sliding or movable body for focussing; this may be as I have seen it, either a sliding wooden body, or what is neater as well as ornamental, extending bellows as in a camera. This does away with the necessity for any tube projecting behind the lens, and the consequent cutting off the corners of the picture, and it also enables an adjustable inner screen to be used for the purpose of shutting off the view of the sides and central partition of the instrument, which interfere greatly with the comfort of vision.

These are defects which will be found in very many stereoscopes of otherwise good construction. I have intentionally ignored the faults of really bad workmanship, because those, as a rule, may be

relied upon as being absent from the work of respectable firms. But the errors of carelessness, thoughtlessness, and ignorance, are in their way of just as much significance to the employer of the instrument, and these are the ones to which the least attention is likely to be given.

From the manufacture of the stereoscope to the production of the slides is but a short stride, and I shall next endeavour to show where the photographer may to some extent improve his ways.

C. BECKETT LLOYD.

(To be continued.)

WRITING AND DRAWING ON GLASS.

II.

Fine-ground glass is nearly as easy to work upon with pen and pencil as note paper. Such glass as is used for the focussing screens of cameras is suitable for this purpose; the roughness of the surface prevents to some extent the spreading of the ink, and by the latter being absorbed, as it were, into the minute depressions, we obtain blacker lines than we should get on smooth glass. Water-colours can be easily applied with a brush; it is best to mix them with a weak solution of sugar or gum, and to prepare the glass for the colours by a preliminary rub with a cloth made damp with the same fluid. After the writing is completed the appearance of plain, unground glass may be produced by varnishing it. Negative varnish, containing shellac, will do very well, or Canada balsam, thinned with benzole, may be used. The latter will take some hours to dry, during which it should be carefully protected from dust.

Matt varnish may be used to impart an artificial grained surface to smooth glass; it is easily made by dissolving ninety grains of gum sandarac and twenty grains of gum mastic in two ounces of ether, to which is added benzole, the amount of which may vary from half an ounce to one and a half ounces, according to the fineness of the matt required. This fluid is applied by pouring it on the cold plate; as soon as the varnish has set, the glass may be heated to ensure a firm and even grain. Upon this surface writing with a pen or pencil can be easily executed when dry; a syrup or gum arabic solution may be applied with a brush to restore the appearance of unground glass. As sandarac, the chief constituent of matt varnish, is soluble in methylated spirits, we cannot use collodion or shellac varnish to impart transparency, so we are obliged to adopt a water solution, such as syrup, as a protection for lead-pencil work, while in the case of ink Canada balsam may be used.

Resin is one of the substances that enable us to work with a plum-bago point upon a smooth surface. A thin film of the gum is easily produced from a solution of it in turpentine or benzole, in the same way as gum dammar is used, and resin being of a brittle nature a little caoutchouc added to this solution will be an improvement. Resin is remarkable in its way, for it dissolves in methylated spirits as well as in turpentine. The former solvent (or spirits of wine) is the best for our purpose, as it contains no grease, and as Canada balsam, thinned with benzole, is also mixable with spirits of wine, a very small quantity of it may be added to the resin solution, to impart the requisite toughness and adhering power. A plain glass coated with this medium can be worked upon with pen and pencil, but it is not equal to gum dammar as a help to retouching, as the resin, though it is brittle when cold, is apt to become tacky when heated, which might occur in printing off a negative in the sun; another fault is that the resin film dissolves when the negative varnish is applied, so that work done by the lead pencil is exceedingly apt to become displaced. The only chance of a disturbance not taking place is when the resin film is very thin, and the pencil point is hard and sharp, so that the impression is driven into the gelatine basis.

Sugar, although not generally known as a medium for writing on glass, is perhaps the very best. I have used it for some months, and prefer it to any other substance, gum dammar included. It is suitable both for the lead pencil and for the pen. If a sketch in lead pencil upon clear glass is wanted as a lantern slide I would use a film of sugar, as I could produce thereon lines almost opaque in their blackness, and shading of any depth, combined with a singular freedom from grit. With a gum dammar film the lead is apt to break off in tiny pieces, and a shade, or half tone, cannot be easily produced free from black specks. If an ink sketch or writing is required, with

lines clear and distinct, then I would again use a sugar film, as I could produce thereon with ease the finest lines that a pen could trace. The ink, prepared itself with sugar, takes perfectly to the sugar surface, and shows no tendency to spread over the glass. There is no trouble in getting the ink to flow from the pen; sugar in solution is very tenacious of its continuity, and does not easily divide into drops, which cause blots in writing. Syrup has the same characteristics as thin treacle—we cannot divide treacle into small drops; if we pour it slowly from a bottle we obtain an attenuated thread of the substance. So syrup in a pen forms a narrow thread at the nib point, and being previously darkened with lampblack or other pigment, enables the finest black lines to be produced if required.

Saccharine matter exists in various well-known forms—there are white, brown, lump, crystallised, and moist sugars, and there is treacle. Treacle is a very good thing no doubt, but it is useless for our purpose, as it resembles calcium chloride in its power of absorbing moisture; it can be hardened by heat, but if exposed to the atmosphere it soon regains its pristine softness. Brown or moist sugar partakes of the nature of treacle to some extent; it can be dried by heat, but it absorbs a little moisture afterwards. White sugar, on the contrary, has little tendency to become softened by damp, and for an ink sketch on glass, a syrup made by dissolving white sugar in cold water is the best medium. Such a film, when perfectly dry, presents too hard and polished a surface for the lead pencil; by breathing on it the sugar becomes softer, and it then takes the lead perfectly. There is, however, some danger of overdoing the softening process, the result of which is that the lead point sinks into the film and causes a furrow instead of a clear line on the surface. So for the lead pencil I prefer to use white and brown sugar in equal parts, dissolved in cold water. This syrup may be spread on the glass either by pouring or with a brush, and the film may be quickly dried by heating the glass plate. But there is a better way of applying an even film of sugar to glass. Thin syrup has the curious property of being mixable with methylated spirits without causing the precipitation that occurs when gelatine or gum arabic is so treated. Thus we can add syrup to alcohol and coat a hot glass plate exactly as if we were using negative varnish. The film will be dry in a minute or so, and if the glass is perfectly clean the sugar will be equal in thickness throughout. It is best to mix the thin syrup with alcohol in equal proportions and to use it at once; if left at rest for some days a portion of the sugar is deposited in crystals on the sides of the containing bottle and the mixture does not then produce so even a film as at first. The glass should be made quite hot before pouring on the fluid, to secure the best result.

Sugar dissolved in water does not act exactly as a salt would do. The latter usually dissolves to a certain extent in cold water, and to a greater extent in boiling water. When the water cools a portion of the salt is precipitated. White sugar, so far, does the same. If a solution of salt in cold water is allowed to evaporate slowly the salt is gradually thrown down in crystals, but sugar so treated does not crystallise, it becomes of a thick pasty consistence and dries eventually as transparent as glass and with the same polished surface. So we can use syrup as a varnish, but salt we cannot.

A great advantage of the syrup foundation in writing on glass is that a shellac or mastic varnish can be applied as a protection against damp without the slightest fear of disturbing the design. We have seen that a resin film dissolves if varnished; a gum dammar film resists a spirit varnish better, but a pen-and-ink sketch thereon becomes woefully faint and attenuated. I presume that the sugary ink becomes softened under the hot varnish and shrinks up, so that the lines become finer. A similar sketch on a sugar basis is unaffected during the varnishing process.

ALBERT WM. SCOTT.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

In the last issue of the JOURNAL we left off our list of colours at Prussian blue. We next come to—

Burnt Sienna.—Which may be described as an orange of a very rich and transparent brown hue. It is a most useful colour, and

* Continued from page 552.

besides being invaluable for many combinations with other colours is also very effective in painting warm complexions.

Mars Orange.—This is also a very clear and beautiful orange, partaking of the character of the burnt sienna, but free from the tendency to brownishness, which is a strong feature of the latter colour. It will therefore be found very valuable for bright sunny tints when applied in pale washes, and will be found unsurpassed for clearness of tone in its use for flesh painting.

Burnt Umber.—This colour will be found very useful for painting hair, also for draperies, &c.

Sepia.—Is a very valuable cool brown pigment. Its pale washes are extremely clear and transparent. It lends itself favourably to mixing with other colours, and by this means a great variety of valuable tints may be obtained.

Madder Brown.—This is a most beautiful colour, and as useful as it is beautiful. It may be described as a rich, lakey, russet brown. By its use the richest descriptions of shadows may be obtained when used in a fair degree of strength, while its paler tints exhibit extreme delicacy. Combined with cobalt it makes a delicate grey for the flesh, or soft tint for the shadows on the face, &c. It will be found also very effective for many of the darkest touches in the flesh. When the draperies are red it may be used in the dark shadows to lower the general tone, &c.

Neutral Tint.—A very useful grey, and especially adapted for combination with many other compound tints. In working up *monochromes* it will form a suitable tint when combined with carmine, or burnt carmine and sepia, or even black. Of course this must very naturally be greatly influenced by the colour of the photograph to be worked up. It is a matter of no small importance that in this regard the tints used should be in strict harmony with the photograph, otherwise a most unpleasant result will be the issue of all our labours.

Purple Madder.—A deep and warm purple of the greatest richness and intensity. By its use may be secured the greatest depth of shadow, free from all coldness of tone. It is a colour that works well, and is extremely useful for deep warm shadows and draperies generally.

Constant White.—This colour has not much body, and may be said to work indifferently, if not absolutely badly. It is only intended for the highest lights where white must be used, as for example the light on the tip of the nose, the light of the eye, &c. There is a *flake white* which is the principal white in oil painting, but I could never make my mind up to use it in water colour.

Chinese White.—This is a most valuable material. It works well in water, has a good body, and is reliable as to permanency. There is no other white which has up to now been used as a water colour which can approach it for these properties. It is needless to say that without these qualities it would be absolutely useless. It should, however, be used in moderation (as a water colour), and preference always given to transparent and pure colours. Of course there are times when a combination with white is not only advantageous but absolutely necessary, but when not so I recommend working without it. Messrs. Winsor & Newton's Permanent Chinese White I have always found most satisfactory and safe in every respect, while others which I have on occasion used (having no option at the time) I have not found to answer my purpose so well.

Lampblack.—A powerful opaque black, mixes exceedingly well with Chinese white as a body colour; it forms a splendid, indeed, I may say, the best ground for a black coat. There is no underlay of colour that it will not cover in this combination, so strong is it as a body colour.

Ivory Black.—This is the most transparent and richest black we have; in its paler washes it will be observed to possess a slight tendency to brown, but used to its full strength it is intense.

Now, these, I think, may be said to be the leading colours used in miniature painting, and by their aid there is no possible flesh, &c., which cannot be faithfully reproduced upon the ivory or Bristol board as the case may be. However, while we are on the selection of the colours, we may as well continue with such as will enable a student to paint any subject that may offer, be it portraiture or landscape, &c.

Naples Yellow.—A colour much used in flesh painting, but I do not recommend it. As I said before, I prefer using as much as possible the more transparent colours. I have seen some very pretty results

where this colour has been employed, but they will not last. There are two shades of this colour, light and deep.

Aureolin.—A rich, sunny yellow, very useful in many ways, and is transparent. It is a powerful yellow, and like all such should be used with care. Can be used for flesh, &c.

Lemon Yellow.—This is a light yellow, with fair amount of body. May be used for high lights in draperies.

Brown Pink.—A yellowish brown, rich and transparent. Can be used with advantage for glazing. I have found it last very well, but it is generally accepted as fugitive.

Cadmium.—There are three degrees of this colour. No. 1 is lightest; No. 2, useful, but still rather light; No. 3 is a deep, rich, and useful colour both in itself and in its combinations with other colours.

Cadmium Orange is a very rich colour, full of light and power.

Yellow Ochre.—This is a useful colour for producing atmospheric effects, as it seems to possess certain qualities of light which render it most effective for skies, &c. It is used in flesh, but, as I said before, I prefer Roman ochre.

Raw Sienna.—A very beautiful colour, a wash here and there in foliage giving great variety and relief. It will also combine with pink madder to make a very delicate flesh, and is generally a good and safe yellow to work into the face, that is on such portions of it where yellow seems to assert itself.

Vandyke Brown.—I do not think this colour wants a description, every one knows it.

Burnt Carmine.—A very deep crimson, useful in making tints for working in monochrome.

Emerald Green.—This colour is well known. It can be made great use of when judiciously treated. When artistically placed it can be of invaluable help to the flesh, and may sometimes be used as a kind of grey on the flesh itself. Many artists get considerable effect with it.

There are few, if any, effects that cannot be depicted with the assistance of the colours just enumerated. Of course there are many other pigments made which are useful and worth having, but they are not *necessary*. As I said, there are few tints that cannot be produced by combinations of the foregoing colours.

It is needless to say that there are essential differences between the art of miniature painting and that of colouring photographs, still, there are many important points in which they are very similar. Both the manipulation and management of the colours will be found to have a very close resemblance in both cases. It is necessary, therefore, that any one intending to direct their attention to the artistic colouring of photographs should at the outset know *something*, if not *everything*, regarding the principles upon which paintings in water colours are based.

There are many beginners who think that there is nothing to do but buy a box of colours, brushes, &c., and set to work and produce good results. Of course they are very soon undeceived. You may think this is not so, but I can vouch for the fact of a gentleman, now one of our leading photographers, who thought *oil painting* an easy matter. He had no very strong reason for holding this belief but the fact of seeing a certain very clever artist daily at his work. He concluded that what the artist could do so easily could not be difficult to him.

So thoroughly did this feeling take possession of him that, on the quiet, he bought himself a set of brushes and colours, &c., had a transparency made from a negative of one of his own children, and determined to make a picture. By the aid of the transparency and a sciopicon he made a fairly satisfactory sketch, and already ideas of the Academy floated across his mind. He took his sketch home and started to work. He was absolutely astounded to find he could not get along, or even get the colours on. He came up and saw the artist at his work, everything seemed easy, he determined to make one more try, but of course it terminated in absolute failure. This may appear romancing somewhat, but I can vouch for the accuracy of it.

No doubt the first thing that showed this gentleman the error of his ways is what would strike all beginners, their utter inability to get anything like a satisfactory result. A beginner who absolutely knows nothing of the principles of water-colouring, is often fairly amazed to find that, after mixing his colours to the desired tint, and

then washing them on to the photograph with the greatest care, he has not succeeded in gaining even a presentable result. On the contrary, the result is enough to make him forewear ever wetting a brush again.

The fact is there is no part of the human face so flat in itself that it can be to any truthful extent represented by a simple *flat* wash, no matter how successfully passed over the photograph. It is necessary to have regard to the modelling, and all those gradations of light and shade caused by the natural undulations. The various gradations between the highest lights and the deepest shadows must be all considered and receive their proper treatment before any degree of satisfaction can possibly result. These various intermediate gradations are known as "demi-tints," "pearly tints," or greys. Now all these various gradations and intermediate greys, &c., cannot possibly be obtained by a first wash. No; this transparency and depth are only to be obtained by calling in the aid of "*hatching*," or "*stippling*," in order to place these necessary greys and "pearly tints" upon the local flesh tint which the *first wash* has already imparted to the photograph.

Without these greys there will be no roundness in the picture; everything will look flat and unnatural. It may be just as well to consider a little what is meant by the terms "*washing*," "*stippling*" and "*hatching*." Washing is using the colour in a liquid state and passing it *evenly* over the surface with broad strokes of the brush, and getting it as *evenly tinted* as possible. It is always best to mix this first tint as near to the desired strength as possible. A very good plan to enable you to judge the strength of the tint is to try it first on an old photograph. I suggest an old photograph because it has an advantage over a sheet of plain paper, inasmuch as it will enable you to better form an opinion as to the depth necessary to produce the desired effect over the *tone* of the photograph you are about to colour.

It must ever be borne in mind that these first washes must be pure and brilliant to a degree. It is an easy matter to lower the tone afterwards to almost any degree, but if once these primary tints are made dull and heavy there is no possible means of restoring their purity. If there be only a few spots here and there they can be taken away with the point of the brush or scraped away, the former for preference. High lights can be secured in the same manner before the *hatching* or stippling is proceeded with. REDMOND BARRETT.

PHOTOGRAPHY AND PHOTOGRAPHERS.

It is generally assumed that a photographer is one who practises photography, and to practise photography is to produce photographs (I can fancy the reader thinking every fool knows that). Still, in spite of the self-evident proposition, scores of persons calling themselves photographers do not produce photographs so understood of the people. They stop a short half-way, contented with the mere production of a negative, with or without assistance. This negative *may* produce a print fit to be looked at or it may not; there is a good deal of chance about it in many cases. The prints made by a great percentage of those who use the camera are very often short of perfection; this may be the result of improper printing *per se*, or it may be because the negative is utterly unfit for the purpose.

I believe it is infinitely more difficult to produce a perfect print than a perfect negative, chemically speaking. Given a negative of indifferent or thoroughly bad quality, no skill will be able to make a thoroughly good print from it, although, with a great deal of trouble, time, and patience, passable results may be obtained. In the first place, it is not very easy to decide off hand, even by those accustomed to it, what sort of prints a negative will give; very different looking negatives will produce equally good prints, and very passable looking negatives often very bad ones; it is not until a proof has been taken that a decided judgment can be made. To print well, all negatives must possess a good gradation of tone; this is imperative, and the tone must range from complete opacity to clear glass. The more perfect this gradation the better the negative.

With gelatine films there is one very disturbing influence, and that is variety of colour, more or less non-actinic, *colour very often taking the place of density*. The formation of a correct estimate of the printing value from the colour of the negative is most difficult, and few will venture, as I have just remarked, on a decided opinion without first seeing a rough proof. This colour influence was almost entirely absent with wet collodion negatives; at any rate, the puzzling variety that now obtains with gelatine was unknown, and the consequence

was a negative could be at once assigned to its proper class, and its printing capacity pretty accurately estimated before any proof was taken from it. We, however, now have to do with gelatine films almost entirely, and sometimes judging by the wet collodion standard, negatives that appear almost everything they should not be will, with a little dodging, give surprisingly good results.

The public estimate a photograph *only in the form of a print*, the negative, to them at least, is thought no more of than the type of the printer as they read the resulting letterpress. This being the case, it seems marvellous that any one can treat printing as a matter of quite secondary importance, looking upon it as a mere drudgery, and simple as turning a grindstone, which I need scarcely say is about as wide of the mark as it very well can be. A negative of *some sort or other* can be taken by anybody who likes to try, and no experience is required, but the difficulty of making a good print is undoubtedly much greater. The importance of a thorough knowledge of printing is consequently vastly augmented by the unequal printing value of the negatives. Instead of being a commonplace, everyday occupation for boys and girls, as many wish it was, it taxes the experience of the most capable workers to the utmost to make those rich and delicate pictures that have caused photography to become so popular.

At *no time* has first-class printing been an easy matter, and now the great variation in quality of gelatine plates, as I have just remarked, enhances the difficulties tenfold. If I might venture an opinion I should say there are no trade printers that have not found out this to their annoyance and disgust, that is, if they take any pride in turning out good work. The quantities of impracticable rubbish called negatives from which prints are required must be enormous. Fortunately for the printers, those who take them are not very exacting, and prints far below the ordinary standard of excellence are considered good enough. Taking the negative is but a beginning, and if all those who take up photography would set themselves to do something more than this elementary work, by making their own prints, they would *soon find out how good or how bad their negatives were*, and the careful performance of this most essential part of the process would act as a check and indication of what to do and avoid in making the negatives. When a man can succeed in regularly producing thoroughly good prints, and *only then*, should he depute the task of printing to others. All doctoring or improvement of the negative ought to be the work of the taker of the negative, it being part and parcel of the same.

In printing, certain conditions have to be observed and conformed to in order to produce anything like a satisfactory result. It will be seen by the following notes that silver printing exacts care and skill of no mean order to produce first-class results. The paper is the first consideration, and much depends on this being of good quality and free from defects. If it is prepared at home, it is sensitised by floating a definite time on a solution of silver nitrate of a suitable strength for the paper used, deficiency in this respect leads to a variety of troubles. Excessive strength, on the contrary, leads to few, or rather to one, that of bronzing in the shadows. The strong bath facilitates the subsequent operation of toning and improves the quality of the print in the end. The paper is now dried and cut up into suitable sizes, laid on the negatives and exposed to the light. Here comes in judgment. A too long-continued action of the light will make heavy, unsatisfactory pictures, and too short, flat, washed-out looking things. Each negative must be printed to suit *itself* and the *subject*—light, delicate impressions will be best in some cases, and strong, bright ones in another. Very much of the beauty of result depends on this part of the printing, and during which any dodging that may be required has to be resorted to, such as shading part of the negative where it prints too dark for the rest of the subject, or printing some parts more than others for effect, tinting down such portions that print too light and are out of harmony with the rest, in fact using the light as a pencil to make up for deficiencies in the original negative, or to subdue something that would otherwise injure the effect of the finished work. It will be seen there is plenty of scope for the exercise of skill and artistic ability, in fact quite as much, if not more, but in another form, than that required for taking the negative.

After this comes the toning, a shoal on which many get stranded, depending as it does on the previous processes of sensitising and washing. Too little printing gives poor, flat results; a foggy, thin negative does the same in an exaggerated degree; every different quality of negative makes a different coloured print. Then, again, the prints will bleach more at one time than another; this is partly depending on the light in which the prints were made, and partly on the condition of the toning bath. This leads to irregularity of colour, although the apparent depth of the printing is the same in all instances.

Again, there is the fading that sometimes takes place in the fixing bath, when apparently things have been all right up to that time. After fixing, there is only one trouble to be guarded against, and that is blisters, to which some paper is particularly liable—a good wash finishes the process, so far as actually making the prints, which, when dried and trimmed, are ready for the mounting. Finally, the prints must be carefully looked over, and any objectionable light spot touched out with colour approximating to that of the print, containing sufficient gum to give an equal amount of glaze with the rest of the albumen surface, then, and only then, can the photograph be considered completed.

I hope to have shown by this slight sketch of the process of printing that it is well worth the attention of any who use the camera, and that to really be a photographer the ability to print *must* equal that of taking the negative. EDWARD DUNMORE.

GELATINO-BROMIDE PAPER AS A BASIS FOR FINISHED WORK.

[American Convention.]

AFTER some introductory remarks, the author proceeded as follows:—

CRAYON FINISHING.

As crayon is the most popular material, I will commence with that. The materials wanted are Conte crayon sauce No. 1 and 3, Conte crayon ordinary, and No. 0 and 1 superfine in wood, three or four leather stumps of various sizes, one dozen paper stippling stumps, a stick of ordinary office ink-eraser, and two rubber stumps, soft and medium, some pumice-stone very finely powdered, and a quantity of carded cotton.

The print to be worked should be printed fully out, that is, it should have every gradation from high light to deepest shadow, and should look a little darker than wanted for a plain print. It should be mounted upon a muslin-covered stretcher, as the best effects cannot be obtained if the print is mounted upon cardboard. Great care should be taken that no starch gets upon the face of the print during mounting.

Material for Stumping.—Take one stick of the Conte crayon sauce and crush it finely; two sticks of No. 1 Conte crayon must be finely powdered by rubbing them upon glass or sand paper No. 1, and be intimately mixed with the Conte sauce.

Place the print flat upon the table. Have a piece of cardboard by the side of the print. Take a tuft of cotton and dip it into the mixture, and rub it upon the cardboard to spread and equalise it; then transfer it to the background of the print, rubbing gently with a circular movement right up and over the edges of both face and figure. Do not be afraid of spoiling your print, as it is easily taken off with the rubber. In putting in your background, see that the darkest part is kept low just over the shoulders, and bring the shaded side of the background up to the lighted side of the face, which should contrast with the shaded side of the face and figure, while a bold shadow should be put in just over the shoulder to balance and represent the cast shadow. When you have got in your background roughly, put aside your cotton and straighten out the three longest fingers on the right hand and rub lightly all over. This is the most important part of the background. The fingers must feel the crayon roll evenly under them, and if they do not, but catch the paper instead, there is not enough No. 1 Conte in the mixture, and more must be added till a gritty feeling is obtained; then go ahead, rubbing all over the background with a circular movement, taking no trouble to keep off the face or any other part of the picture. If you wish to darken any part, rub the tips of the fingers with the same mixture, and transfer the crayon taken up on to the part of the print which needs it, and rub it in. An even tint can be rubbed all over a black coat or other dark drapery in this manner, shadows deepened, and the hair strengthened. In fact, all that is usually done by the chamois skin upon solar prints can be done with the fingers upon the bromide paper. Now take a large piece of clean cotton, and after knocking the superfluous crayon off the picture, rub evenly all over. This will considerably lighten all the crayon; but if not light enough, or there are any inequalities in the background, dust a little pumice powder evenly all over, and go over it all again with the finger, using more pumice powder whenever you wish to lighten, but being careful not to use too much, as an excessive use of pumice powder will rub down and flatten the grain of the paper. If these directions have been carefully followed, the background will show a beautiful grain or stipple, so like a hand stipple that it has puzzled experts to detect the means adopted for producing it. This grain can be varied by the method of handling. With a light rub a large open grain can be obtained, and the heavier the rubbing the smaller the grain will be. Now rub again with clean cotton, and place the picture upon an easel. With an ink-eraser clean the edges of the background and blend with the cotton. At this stage any amount of artistic effect can be put in and taken out of the background. The stump can be used to hatch in broad effects, and the ink-eraser to take out lights, &c. This part of the work it is impossible to describe. Individual taste and experience are the only guides, and the beginner had better not attempt too much in that line till experience has given him confidence.

Having thus far gotten your background in order, we will proceed with the figure. Begin to clean up the face with the rubber stamp, taking out the high lights upon forehead, cheek-bones, and chin, and blend with a small tuft of cotton. In some cases this handy little tool may be made more effective by dipping it just before use into the powdered pumice; thus, by the use of the rubber stamp and cotton blender the modelling of the face can be worked out, and the beginner will now be surprised to find how much lighter the face appears; in fact, it lacks decision, which we will now proceed to put in. Take one of the stippling stumps, and, rubbing it in the sauce before described, mark in the pupils of the eyes, the lines of the eyelash, the shadows under the eyebrows, the brows themselves, the nostrils, and the shadows under the chin, blending all with cotton. Next deepen the shadows of hair and drapery with one of the leather stumps, blending also with cotton or the fingers, now on the deepest shadows of the drapery and everywhere where decisive touches are wanted. Mark in strongly with Conte No. 3 crayon and blend with the fingers. Do not touch these shadows with the cotton or you will destroy their firmness. When you have got thus far you will be surprised what an effect you have obtained with little labour, and now any amount of finish can be obtained by working with the point of crayons No. 1 and 0. The filling in of the face is best accomplished with No. 0, and should be done in the same manner as retouching a negative, filling in and softening breaks or inequalities in the gradations. The No. 1 is useful in rounding and marking the eyes, eyebrows, hair, &c. White drapery should never be touched with white crayon. Any amount of light can be taken out by the hardest rubber, and dark shadows can be lightened with it. Great effect can be obtained by first covering the white drapery with a light tint of crayon sauce rubbed evenly all over with cotton, and the lights taken out with the soft rubber. Lace can be made out in this manner with great effect, and with far better harmony than can be obtained by the use of white chalk, which gives a metallic effect, and for that reason should only be used upon the high lights of jewellery, &c. But, as a rule, the less white chalk used the better.

RETOUCHING OR MENDING.

There is another method of finishing bromide prints which may prove acceptable to those photographers who do not want them finished in crayon, but yet want some kind of finishing or retouching to improve the plain prints, which can be done simply and cheaply by the usual help in the studio. The spotting or mending the white spots upon bromide prints can be done with India ink to which has been added just enough Payne's grey to neutralise the brownish tint of the ink. With this the pupils of the eyes, the line of the lash, the eyebrows, and, in fact, every shadow can be deepened, taking care not to lay the colour on too thick at first. It is better to get the effects by repeated washes than to get them at once, as you are likely to get harsh edges if the colour is laid on too deeply. Having in this way got in your strength, mend the face and fill in any breaks in the gradations with a Faber retouching pencil. If the picture is a vignette, and the blending should be uneven or too abrupt, you can correct that by rubbing upon the parts to be blended pure graphite or plumbago in this manner. You can buy the graphite or plumbago (it is known by both names) at any artists' material store. It is sold in bars or short sticks, something like Indian ink; or, failing that, go into the kitchen and levy contribution upon your wife's stove polish. Take a tuft of cotton and rub upon the bar or cake of graphite till it is well covered and shiny, then gently rub upon the part to be filled up. This matches both in surface and colour the bromide print. Shadows in white drapery can be deepened, and a tint put all over it so that high lights can be taken out with the rubber, just as I have before described in the crayon work.

Another dodge for improving the shadows of a bromide print is to rub over them a solution of wax in benzine, and polish with a brick rub with Canton flannel. To be more definite, take one and a half ounces of bleached beeswax, cut it into small pieces, and put into a bottle with eight ounces of benzine. When the wax is dissolved, apply the mixture to the shadows with a piece of rag, and after the benzine has evaporated rub briskly over the part with Canton flannel till it shines. You will be astonished at the result. The buried details scarcely seen will show themselves clear and distinct, and the shadows will be deepened and made more transparent. This can also be applied all over the print, and gives a surface with a slight gloss, bringing out details and making the print fifty per cent. more brilliant, without the objectionable gloss which you see on a varnished print.

FINISHING IN WATER COLOUR.

Of course, in a paper like this I would not begin to give anything like an exhaustive set of directions for colour finishing, so these remarks must be directed to those who know something about finishing in colours upon other surfaces. You will notice that in the two first methods of finishing I say nothing about preparing the surface of the paper, simply because there is no preparation required. For water colours the surface must be prepared by hardening the gelatine surface with alum. Without this hardening the surface is too receptive, the colour being held when the brush just touches, and any attempt to blend or soften will result in pulling up the print from the surface of the paper; but after the application of the alum you can do anything with it. You can wash in or wash out, and even take out lights with water and rubbing with a cloth,

without raising the surface. The alum solution is one ounce powdered alum to twenty ounces of water. This is swabbed over the surface of the mounted print and left to dry, when it is ready for working upon.

Good effects upon vignetted prints can be obtained with very little expenditure of time by rubbing the background with coloured pastel, the half hard kind, to which has been added just enough powdered pumice-stone to make the mixture feel gritty. Proceed exactly as described for crayon. You can rub one colour over the other, and so get effects of combined tints which are very pleasing. I set my palette for flesh painting with pink madder, vermilion, yellow ochre, cobalt blue, and the various browns for hair, &c. I just put a flat wash all over the flesh of a tint made by combining the pink madder with yellow ochre in different quantities, according to the complexion—a dark complexion needing more yellow, and a fair one more of the pink. Having put in my flesh washes, I next proceed to wash over the shadows with light washes of vermilion to kill the black of the prints. Next put in the carnations on the cheeks and lips; after this the face must be finished by hatching and stippling—the edges of all shadows being stippled with grey composed of cobalt and yellow ochre, the blue predominating on the forehead and upper part of the face, and the yellow on the lower part. All the usual methods of working water colours upon drawing paper, or on any other photographic surface, can be used on bromide paper after it has been prepared with the alum solution.

PASTEL.

There is no preparation of the surface needed for pastel. It takes hold of the surface as well as any other paper, and can be worked by any of the usual methods. I like a good vigorous print with clean lights, and half tints and shadows not too black. I first lay in my dead colouring with soft French pastel, covering the photograph with the flesh tints as near as possible with the proper strengths, lightening up the shadows with vermilion and yellow, then hatching with half hard and finishing with hard Swiss crayons. An effect of great finish is obtained by this method.

OIL.

For painting in oil upon a paper print, a sizing must be used to prevent the oil in the colours getting into and staining the paper, which it will do in spite of the gelatine. The sizing solution is ten grains of gelatine to one ounce of water, brushed evenly over the print with a broad camel-hair brush. As with pastel, so with oil. I prefer a good, clear, strong print, and work somewhat in the same manner, viz., from the shadows to the lights, painting over the photographic shadow with warm transparent colours, and using opaque colours on lights, half lights, and reflexes, finishing with solid colour on the high lights, and cool greys on the edges of the shadows.

G. H. CROUGHTON.

ADVERTISING AND PRICES.

[American Convention.]

DOUBTLESS others will have many papers treating on the theory and practice of the various processes worked in the daily avocations of the photographer. In this case it will be well to let us consider for a few minutes a subject that is uppermost in the minds of many, even if we are unable to remedy the evils that photographers are suffering from. But I am convinced that many among you will go home disappointed if this subject is not broached. There are some who say it is absolutely useless to touch it; that it is treading on dangerous ground; that it is an evil that must work its own remedy; that every one has a right to carry on his business as he pleases; and that, notwithstanding anything that may be said here, no reform can be made practical that will be adopted that can benefit the craft. I wish to suggest that at least an effort can be made in this direction. No reforms have ever been accomplished without overcoming frequently insurmountable and formidable obstacles. Let us see if we cannot find a Gladstone and a Parnell to aid us; or, perhaps, in the minds of many, a severe coercion act would be more applicable in our case, as being more effective to aid us in voting out the pests that are a curse to our beautiful calling. There is no country in the world where competition is keener than among the photographers of the United States, nor is there a country on the face of the earth where the effects of cut-throat prices and cheap-Johnism have been more seriously felt by the members of the profession.

To many here this subject is of great import. From the advertisements of photographers inserted in the Chicago daily papers, the business of photographers for hundreds of miles around is affected and that most seriously. In no other country nor in any other city are to be read such disgraceful and unprofessional advertisements as are to be found most frequently in our leading newspapers, and especially on Sunday. It is a disgrace to our leading journals to allow their columns, for the sake of a few dollars, to be used to abuse members of a reputable profession, as is frequently done right in this city. You cannot find a member of any other profession but the photographic who delights in publicly degrading and insulting his competitors. Sometimes the attacks are of such a personal character that in many European and South American countries the proprietors of the newspaper, as well as the advertiser, would be held responsible and justly chastised or "called out" and made to account for his actions; but in this free and enlightened country the cowardly

and base advertiser who has a few dollars to throw away can at will hold up the followers of the same profession in which he makes a living to the ridicule of the public. If we want the public to respect our calling we must respect ourselves. Of late this mania for large and vulgar advertisements is spreading, and there is no knowing where and when it will end. The majority of our successful photographers advertise very little in the daily papers, and, if at all, generally a neat and respectful advertisement without any allusion to their competitors. Other professional men rarely make any reference to one another. It would not matter so much to the whole fraternity what an individual might occasionally say about another in the same business, but the dire effects of advertising cut-throat prices is felt throughout the neighbouring States that are adjacent to a city like Chicago, whose papers are sent out in thousands on the morning trains.

The disgustingly-illustrated advertisements of some photographers cannot help but attract the attention of the unthinking. The members of this Association might pass certain resolutions as to what they consider professional etiquette as regards advertising, but it is to be feared it would have no effect on the photographers who were endeavouring to drag into the mire the whole profession.

I consider this matter of advertising, and the serious question of prices, should be brought up for discussion at least. It would be well, on an occasion like this, to let the public know that photographs are being made by some at prices that lead only to ruin and degradation of the man who makes them, and that the man who respects himself sufficiently to obtain higher and remunerative prices is the artist who is looked up to and, in the long run, patronised by those who have been disgusted with the work done by the majority of those who give their professional services for little or nothing. The great difficulty in grappling with this question is that portraits made at low rates are much too good for the money, and we are reluctantly compelled to acknowledge that they satisfy a certain class of people who do not go into the artistic merits of a photograph. To them a print from any negative is a portrait. One remedy, as proposed by Mr. Scotford, could be made a success if the majority of the members of this Association would take hold of it, subscribe sufficient working capital, and provided practical business men were given the management of it. Perhaps it will be well to explain in as few words as possible that Mr. Scotford's idea was that a joint-stock company should be formed by photographers, they owning all stock. When any photographer in any town or city undertakes to make a cut, the company steps in and rents a gallery of a member and aids him to meet the cut, or they erect one themselves and run it until the man who started the cut gets sick of it and agrees to abide by an established rate. My object in bringing this subject before you is not to propose a remedy myself, but with the view that by calling your attention to it some among you might suggest a manner of alleviating the suffering of those who are unfortunate in having small galleries and unremunerative businesses, owing principally to the cut-throat propensities of a few who do not care what becomes of his neighbour.

It is well known that many will use the hackneyed phrase with regard to this price question, "What are you going to do about it?" My answer will be: "Let us tackle it and wrestle with it, for if it is left alone it will drag on for years." It would be well for the fraternity to do away with the pernicious system of giving chromos and life-size portraits with every dozen cabinets.

It does seem strange that there should be less unity among the photographic profession with regard to a scale of prices than in almost any other calling. The hod-carrier, carpenter, and even the bootblack do not cut prices like photographers. There should be more unity among those who work in photographic studios. If assistants were banded together they would get better wages and could better their condition. To avoid a waste of time in discussion on the subject of prices, it might be well to appoint a committee of three proprietors of galleries to make an investigation and report, if possible before the close of this Convention, on the price question.

C. GENTILE.

CONTINENTAL PHOTOGRAPHY.

[Translations and Abridgments.]

MISCELLANEOUS ITEMS.

AN exhibition is now open at Boulogne-sur-Mer, and a portion of its space is devoted to photography.

The name of the new photographic organization in Vienna is the *Club der Amateur Photographen*.

To accelerate the speed of gelatino-bromide plates, says the *Photographische Mittheilungen*, M. Himly puts them, before development, into a solution of one-three-hundredth of nitroprusside of sodium. The results are analogous to those given by thiosulphate of soda much diluted (one-five-thousandth), but with the great advantage that nitroprusside of sodium will work with the pyrogallol developer.

Dr. Eder states that gelatine plates, rendered sensitive to orange and red rays by a bath of cyanine, are less rapid than ordinary plates, or plates treated with erythrosine. They require four or five times as long an exposure. They will not keep well more than eight or fifteen

days; reduction begins at their edges, and gradually extends over the whole surface.—*Photographische Mittheilungen*.

M. Adolphe Martin has exhibited to the French Photographic Society three wide-angle lenses, the curves of which he stated to have been calculated with the greatest care, so that chromatic aberration was totally corrected, and the central and marginal rays brought to a focus at the same points. The lens of 15 cm. focal length sharply covered a plate 13 x 18 cm.; that of 19 cm. focal length, a plate of 18 x 24 cm.; and of 23.5 cm. a plate of 24 x 30 cm.—*Bulletin de la Société Française de Photographie*.

The London correspondent of *Le Moniteur de la Photographie* says that it was desired to ascertain if the same classes of clouds had the same general forms all the world over, which problem could be solved by photography only, and that the Hon. Ralph Abercrombie has presented to the Royal Society of London a series of photographs of clouds taken in different parts of the world, replying to the question at issue in the affirmative.

THE EFFECTS OF HEAT ON THE LATENT IMAGE.

Herr Gædicke has carried on a series of experiments which prove that an exposed gelatino-bromide plate may be submitted to a somewhat high temperature without destruction of the latent image; when, however, a temperature of from 85° C. to 90° C. is reached, an action takes place which results in fog in development. This fog is more or less intense. A temperature of 100° C. results in so much fog that the image is masked therewith.

If instead of experimenting with plates in a dry state the film is first expanded with water, the latent image will not disappear with heat until the gelatine begins to melt, and then it is only deformed by movements of the liquid. This takes place even when the plate is kept in a truly horizontal position.

An image can be formed upon a liquid film of gelatine emulsion upon a horizontal plate; it may be developed after the gelatine has set.—*Photographische Mittheilungen*.

EXPERIMENTS WITH PLATINUM PRINTS.

Herr E. Vogel says that to give a glossy surface to platinum prints they may merely be dipped in a weak solution of gelatine containing a little alcohol, after which the gelatine is hardened by a bath of chrome alum.

If a higher glaze be desired powdered shellac dissolved in a cold, concentrated solution of borax may be employed; it takes several days to dissolve. The print should be floated upon this bath, then suspended to dry.

If still more glaze be desired the proof may be soaked in a solution of gelatine, then squeegeed face downwards upon a sheet of glass coated with collodion of one per cent. When dry the print is stripped off the glass.—*Photographische Mittheilungen*.

FRENCH PRIZES FOR PHOTOGRAPHIC PRINTS.

The Committee of Administration of the Photographic Society of France has resolved that prints presented to the Society at its ten meetings between November, 1887, and August, 1888, will be taken into consideration in the following matter, if their producers make a demand to that effect. In the course of August, 1888, after the meeting in that month, the prints will be submitted to a jury of five members appointed at the general meeting. This jury will have at its disposal (1), a silver gilt medal, (2), two silver medals, and, (3), six bronze medals, to be awarded in recognition of the prints thought to be most remarkable. The medals will be distributed at the meeting in September, 1888. The Society reserves to itself the right of using the pictures for which medals have been granted in such publications as it thinks proper, and particularly for the illustration of its own journal.

PHOTOGRAPHY AT THE PARIS EXHIBITION.

In the general classification of the French Universal Exhibition of 1889, photography is included in Group II., "Education and Instruction—Materials and Processes of the Liberal Arts." Photography forms Class 12 of this group.

The Committee of Admission, which has already commenced its work, will meet on the first Thursday of each month in one of the salons of the buildings of the Administration, Avenue de Labourdonnais, Champ-de-Mars, Paris, to attend to communications received. Those who wish to exhibit should apply early. Forms of application for space may be obtained of the members of the Committee of Admission, also of the Minister of Commerce, 20, Rue de Varennes, Paris, and when filled up should be posted to the Director General of the Universal Exhibition of 1889, 20, Rue de Varennes, Paris.—*Bulletin de la Société Française de Photographie*.

INTERESTING OPTICAL APPARATUS DEVISED BY ANSCHÜTZ.

Herr Stolze, in relation to the instantaneous photographs by Ottomar Anschütz, as seen in the *phénakistiscope*, says that he was deputed by

the Minister of Public Instruction of Prussia to assist in experiments made by Herr Anschütz to represent animals in motion by means of photography. Herr Anschütz placed around the circumference of a vertical disc of steel from fourteen to ninety-four photographs, ten centimetres square, printed as transparencies upon glass. Behind the most elevated part of the disc a plate of opal glass was fixed, behind which again was a Geisler's vacuum tube of spiral form, through which induction sparks were flashed at the rate of thirty a second. When the disc was made to turn with proper velocity a spark illuminated in succession each of the revolving transparencies, and the impressions thus produced upon the retina of the observer became combined in such a fashion as to convey the sensation of the movement of the animals pictured. In this way Anschütz illustrated the movements of the horse. The play of the muscles of the horse could be perfectly seen—the movements of the ears, mane, tail, and so on.—*Photographisches Wochenblatt*.

"SOLID BROMINE."

A correspondent of *Le Moniteur de la Photographie* speaks of a new preparation by Mr. A. Brand, which he calls "solid bromine." It is simply silica impregnated with a certain quantity of bromine. The silica of infusoria (*ieselguhr*) is taken, mixed with ten per cent. of chalk or soda, and charged with bromine; then little sticks of the mixture are made, seven millimetres in diameter, which contain about one gramme of bromine to each centimetre of length; larger sticks of fifteen millimetres' diameter contain three grammes of bromine per centimetre. By these means given quantities of bromine can be introduced into a solution, in which the silica sinks, and from which it can afterwards easily be separated. It is a means of enabling bromine to be used in the laboratory without risk to health from its vapour.

PHOTOGRAPHING FIREWORKS.

M. Barral, of the Faculty of Medicine at Lyons, has been experimenting on the photographing of fireworks, and taking note of the photogenic action of travelling flames of different colours. He had good opportunities of so doing, the principal fireworks of the 14th of July *fête* being let off within fifty metres of his house. He exposed his plates for fifteen seconds, in order to obtain, upon a black ground, a sufficient number of trails upon each. Henderson's 13 x 18 mm. plates were used, with a No. 3 Derogy lens, without a diaphragm. He obtained the best results when he used an iron developer.—*Revue Photographique*.

PREPARING PAINTINGS FOR COPYING.

Before photographing a painting, its peculiarities should be examined, especially in the matter whether it is or is not varnished; but in either case it will often be found that particular colours in it have a matt appearance, known as *embu*. These *embus* may be rendered harmless by passing over the painting a sponge or brush charged with the albumen of an egg which has been beaten into a froth, and then allowed to repose; two or three drops of ammonia should be added, to impart keeping qualities. With very old pictures the same result may be obtained by rubbing them lightly with a flannel upon which one drop of the finest salad oil has been allowed to fall; the opposite side of the piece of flannel to that on which the drop of oil falls is the side which should be applied to the painting.—*L'Amateur Photographe*.

EXHIBITION OF THE ROYAL CORNWALL POLYTECHNIC SOCIETY.

LIST OF AWARDS.

- 1st Silver Medal.—H. P. Robinson, W. J. Byrne, F. A. Green.
2nd Silver Medal.—B. Wyles, J. Lafayette, W. H. Hyslop.
1st Bronze Medal.—F. Whaley (special), Warwick Brookes, Morgan & Kidd, Dr. E. W. Alabone, W. J. A. Grant, Rev. H. B. Hare.
2nd Bronze Medal.—G. Dunson, F. B. Dagley.
Highly Commended.—J. M. Brown.

Our Editorial Table.

VARIOUS APPLIANCES FOR RETOUCHING NEGATIVES AND PRINTS.

By L. & C. HARDTMUTH, Vienna; and 2, Long-lane, Smithfield, London.

MESSRS. HARDTMUTH have been going in for the special requirements of photographers, and among other things they have prepared an exceedingly comprehensive set of pencils for retouchers. These are made of compressed lead—by what means compressed we do not stay to inquire. It is enough to say that between their six-II grade (which are as hard as can be) on the one extreme, and their six-B

grade on the other—this latter being softness and blackness itself—the one merging into the other through a graduated amount of twelve pencils, there is such a degree of diversity as to more than satisfy the most fastidious of retouchers. This series of *Graphite Comprimé* will form a useful addition to the appliances of the retoucher.

But this firm is not confining itself to retouching pencils, for it also sends us an assorted selection of hard chalks, which we find on trial to be exceedingly useful for touching-up prints produced on bromide paper or platinotypes.

A CONVENTION GROUP.

By WILLIAM CROOKE, Edinburgh.

WHEN the members of the Convention of the Photographers of the United Kingdom visited Edinburgh they were photographed in a group by Mr. W. Crooke, of that city, the location selected for that purpose being Craigmillar. Mr. Crooke has sent us a print in platinum from the large negative he obtained on that occasion. As a work of art it is admirable, while it is doubly valuable on account of the excellent likenesses of the visitors, added to whom are several leading members of the Edinburgh Society. Mr. Crooke informs us that he supplies these large prints (unmounted) at 10s. per copy.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 11,782.—“An Improved Sliding Shutter applicable to Photographic and other Purposes.” J. T. MAYFIELD and J. T. TODMAN.—Dated August 30, 1887.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
September 13 ...	Manchester Amateur	Masonic Hall, Cooper-st., Manchstr.
” 13 ...	Derby	Sykes's Restaurant, 33, Victoria-st.
” 13 ...	Bolton Club	The Studio, Chancery-lane, Bolton.
” 14 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
” 15 ...	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday, September 1, at the adjourned special meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. J. Traill Taylor presided.

The new rules were passed, and the meeting, at a late hour, was made ordinary.

The CHAIRMAN said that Mr. Gray was present to give particulars about the lightning photograph questioned at the previous meeting.

MR. W. E. DEENHAM stated that remarkable scientific facts were accumulating in the photographic world; at another society a member ascribed a photographic effect to an increased rotation of the earth upon its axis, and at their own previous meeting it had been urged that a lightning flash could turn back upon itself in a loop.

Mr. J. GRAY exhibited the negative, and said that it was taken at Brixton at nine o'clock at night. The lens was uncapped for about two minutes; he rather thought that there were two flashes. The general direction was horizontal, so the discharge seemed to be from cloud to cloud.

Mr. W. H. HARRISON stated that a flash might have one general direction, yet from the effect of perspective seem to turn back upon itself in a loop. He illustrated this by means of a wire twisted into a rough somewhat spiral form, and said that in meteorological research it was evidently necessary that each flash should be photographed from different points of view.

Correspondence.

✉ Correspondents should never write on both sides of the paper.

THE NOMENCLATURE OF LENSES.

To the EDITORS.

GENTLEMEN,—Will you allow me to add a few remarks on the above subject and the discussion that arose from the protest of Messrs. Voigtländer & Son? I feel confident that every one who has fairly considered the question, will acknowledge that the spirit of the protest is just; and that the designation of particular manufactures should be respected as proprietary.

Messrs. Perken, Son, & Rayment are only one of many dealers and some (perhaps) manufacturers, who have of late systematically advertised lenses styled similarly to inventions to which particular names were given by the originator. I refer to the terms “Rapid Rectilinear” and

“Wide-Angle Rectilinear.” You, gentlemen, and many of your readers, are well aware of the fact that not long ago the above terms, as applied to photographic lenses, were often used *alone*, and were as distinctive of manufacture by Dallmeyer, as were the “Rapid Symmetrical” and “Portable Symmetrical” lenses of Ross, the “Aplanats” of Steinheil, and the “Euryscopes” of Voigtländer.

While fully appreciating the truth of the maxim of “imitation” in its relation to genuine and sincere flattery, I cannot but commiserate those whose vocabulary does not permit an independent selection of titles suited to their own articles.

I understand that Messrs. Marion & Co. have been engraving lenses “Rapid Rectilinear,” but it is due to them to say that they have discontinued doing so, acknowledging the title as proprietary.—I am, yours, &c.,
19, Bloomsbury-street, W.C. THOS. R. DALLMEYER.

FIFTY SITTINGS FOR A PORTRAIT.

To the EDITORS.

GENTLEMEN,—I would not trouble you with any further remarks upon this subject, but I feel assured the letter of your correspondent, John Patrick, should not be passed over in silence. He takes what seems a broad and fair view of the matter, and I feel sure would not be satisfied if his opinions did not receive recognition. There is much in his letter which is very true and with which I quite agree, but there are also parts which I cannot let pass without protest.

I must disagree with the opinion that, as it were, “honours are divided” in this matter between the gentleman who disputed my original assertion in the JOURNAL (page 406) and myself. If I am right he must be wrong, because he, “A Painter,” said I was. However, I think on all hands we can cry “Enough!” as regards this, for every correspondent acknowledges that photography *can* and *does* help the artists of to-day, more or less.

There is a suggestion, if I read aright, that certain artists could not be bound by the trammels of photography. Now I am of opinion that a first-rate artist can use photography as a help, and that such help will not in the least hamper his style and treatment of a picture. I cannot, for example, fancy that Sir F. Leighton, in the case mentioned by your correspondent (Mr. H. S. Moberly), was in the least hampered when once he made a fair start upon his work. I would also feel inclined to wager that no ordinary spectator would notice anything in the finished picture which would lead him to suppose that Sir F. Leighton did not paint it under his usual conditions and free from the *help* or, as some people think, the *hampering influence* of photography.

In the fifth paragraph of your correspondent's letter he describes a certain class of artists who could not draw sufficiently true to nature “to make a striking likeness.” Don't you think in such a case these artists should not pose as *portrait* painters, but rather give their sole attention to colour and the production of “fancy heads,” &c., where *likeness* is not a consideration? But all this gets away from the original point at issue; viz., “*Can or can not photography be a help to the artist?*” It does not matter whether for drawing, expression, or saving of sittings, but simply, Can it be a *help* in any way? I said it *could*—nay, *was*. “A Painter” contradicted my assertion. I will leave it to your correspondent, John Patrick, to say if there be any difficulty as to *who* is right; but there can be only *one*.—I am, yours, &c.,

REDMOND BARRETT.

PAINTERS v. PHOTOGRAPHERS.

To the EDITORS.

GENTLEMEN,—In recent issues of the JOURNAL have appeared a correspondence wherein is renewed the ever-recurring warfare between artists and “photographers.” This time the subject of dispute is, whether photography is of service to artists, and it seems to me that the attitude assumed by the artists towards photography is very ungracious, whilst the photographers, in a spirit of exaggerated self-defence born of the unjust disdain they have been accustomed to receive at the hands of the more haughty professors of the palette, enter the contest in blind anger, and miss the point of their adversaries' contention.

That photography is of use to artists ought not to be denied, but those benefited by it should come forward and acknowledge the fact. The most signal instance of its usefulness is in the case of instantaneous photography, which has made such rapid strides of late, and I hope that by its aid we shall see produced many paintings representing scenes of lifelike activity, such as would have been almost impossible to artists who flourished before the advent of this most remarkable branch of photography. To depict life in motion has hitherto been a matter of such difficulty that only men of the highest talent could hope to surmount it. In reviewing a collection of modern paintings, who has not been struck by the prevalence of works whose subjects show a superabundance of repose? Over all there hangs a languid air of wearisome *inertia*. This is the result of the restricted conditions under which the artists have had to labour, the most imperative of them being that the drawing and painting be correct in all the details. Now to secure this they have been compelled to copy from living models, who did but simulate action; and there is an obvious distinction between the springiness and “go” of a figure that is actually moving, and the dummy-like rigidity of one that

is merely holding itself, or being propped up, in a position to imitate the movement which it is intended to delineate. It is in this direction that photography is now able to lend the most peculiar and invaluable assistance to the artist. Certainly, art has resources of her own, to display and heighten the effect of transient motion, but in the light afforded by recent example of instantaneous photography we find that even her happiest efforts are often far from being *en rapport* with nature.

Instantaneous photography, rightly employed by the painter, is able to release him from conventional bonds, and to enlarge very greatly his range of subjects, and such aid should be received by the artist with gratitude and praise. Photography is a valuable handmaid to the landscape artist, and furnishes him with memoranda of natural effects. These memoranda are easily produced, and with such swiftness can they record the appearance of fleeting cloud, glancing rays, waving foliage, rippling brook, and rolling sea-waves, that they possess a truthfulness, an unity, and a spontaneity, which cannot be equalled by the most facile sketcher.

That the mechanical artist, as, for instance, the engraver, is indebted to photography for much help, is so well known that we need not dwell on it here; suffice it to mention in passing, that all the visible universe contains may come to him in morsels from time to time, and for illustrations of many kinds photography does, in an inimitable manner, all that first part of his work which formerly he would have entrusted to a draughtsman.

We come now to a consideration of the ease of a most interesting personage, the artist who is going to paint, let us say, a human head, in proper colours, as a portrait. Now, a little transparent colouring applied to a good photograph will often result in a very pleasing and natural picture at a small cost of time and labour, and may be far preferable to the ordinary work from nature of a mediocre artist; but, if we are to suppose that the very best result is sought for, regardless of expense, and that a really good artist can be employed, then we are prepared to admit that he may not find photography of much use to him, because if he is able to colour a photograph in a perfectly satisfactory manner, especially with anything approaching to opaque materials, it is very likely he will be competent to do equally good, or better work, from life, always supposing his choice be perfectly free, and that his model is able to sit still, which consideration excludes young children. No artist with a commission to paint a picture of one, or many, of these most charming, but mercurial, of nature's productions would, in his right senses, hesitate to avail himself in some measure of the assistance of photography.

Certainly, although a good model be procurable, some preliminary sittings may be avoided by beginning the painting from a photograph, and bringing it forward to a certain stage before requiring the attendance of the sitter; but then the saving of time and trouble effected will be rather for the benefit of the sitter than the artist, except in the case where the model has to be paid so much an hour, when a considerable sum of money might be saved to the artist.

Then there are cases common enough where the actual presence of the subject, whether by death or other cause, is presented, and perhaps some small photograph is the only clue which will help us to rescue from oblivion the memory of a departed form. In this noble and gratifying task the photographic enlarger and the portrait painter can work together, and as a result of their joint labours they may possibly produce an image which, glowing with the colours of life and by its natural dimensions and intelligent expression, may seem indeed a most perfect "counterfeit presentment" and "a pretty mocking of the life," helping to nourish "the sad remembrance fondly kept," forming the most cherished *souvenir*, to be placed foremost among the household gods, and to be preserved with veneration as a heirloom as long as canvas and paint will hold together.

Meanwhile, photography might be more frequently utilised, even in drawing the human figure, than it is now, were it not for certain objections, some of which I will proceed to enumerate. In the first place, we have, as a rule, the shadows on the flesh so much blacker or lower in tone than they appear in nature; but this defect will disappear in measure as we advance in the perfection and general adoption of orthochromatic photography.

Distortion of the *contours*, and gross exaggeration of the perspective, are grave faults and serious drawbacks, which might be greatly obviated; and if even they could not be eliminated might be at least reduced to a minimum, if photographers generally would be more awake to the enormity of the evil, and went in for securing good "drawing" even though it be at the expense of some other quality.

Lastly, we see the artist knocking his shins against a very hard stumbling-block that has only of late been placed in the way by some ill-advised persons, who seem to think a great deal of their clumsy article—in fact, as it was rather expensive they are inclined to consider it quite an ornament. I refer to the "*rétouche*," as this is now become usually excessive in quantity, and displays more or less ignorance of all that is "art." I cannot wonder if the educated artist has a great objection to it, and, where ideality and softness are required, would prefer to do them himself.

Having shown that photography is in many respects of great utility to artists, I will not stay now to speak of certain variations of the proposition which occur to me much further than to commend them to the attention of the reader; they are—the utility of artists to photography, and the utility of photography to art itself. I cannot, however, refrain

from suggesting that it is in close connexion with art that photography is destined to be of the highest usefulness to the world, not by rendering unnecessary the calling of the artist, but supplementing it and helping to distribute among the multitude that thirsts for beauty a plentiful supply of good and cheap art.

It being a fact, then, that the two sisters in art, photography and painting, have grown so useful and necessary to each other, let their be no discord between them, but rather may they continue in their career of mutual benefit, and for ever go, "like Juno's swans, coupled and inseparable."—I am, yours, &c.,

F. WILCOCKSON,
26, Charleston-road, Ranelagh, Dublin, August 31, 1887.

To the Editors.

GENTLEMEN,—There appeared in the JOURNAL from the pen of "Free Lance" some strong remarks relative to my assertion "that a portrait painter cannot receive any assistance by aid of photography," so I think myself entitled to beg of you to excuse a few more lines about the subject as reply.

That there are plenty of portraits worked up with the aid of photographs, alas! no one can deny, and I distinctly acknowledged this fact. But I said such work could only be accepted as an imitation without value relative to art. That this assertion is not so very audacious as it may possibly to some persons appear, I hope in the following quotations to show. It will not be disputed that by painting a portrait the use of one or more photographs can, at the best and uttermost, only help the painter by furnishing him with an accurate design in outlines and details, and by this enable him to finish a picture closely resembling the original, or, as the artist calls it, an *imitation*, respectively a *realistic work*. Now Mr. D. C. Thomson speaks about such paintings in an article headed *Realism in Painting*, published in the *Art Journal* of August, 1886, page 226, thus: "Again, the art of portraiture in painting may be realistic, as, for instance, such a likeness that when a dog comes into the room he would go up to the picture, taking it to be his master. This, to some people, is the highest art, and they speak of the painter as if he were a world's wonder. But such a picture is not, properly speaking, art—it is simply a process which any fairly gifted person may accomplish, and, in fact, it is almost mechanical." Further, he asserts: "But realism is very apt to descend into imitation, and imitation is the very lowest form of art."

In the same sense a famous French art critic, Mons. A. L'Hornier writes: "L'art n'est pas une étude de la réalité positive — c'est une recherche de la vérité idéale." To produce a work of art, the artist is bound to study nature in her eternal beauty; the holy spirit of the Creator, which prevails in all nature, must inspire his beginning and his end, and no mechanical process will help to catch the poetic sublimity of form and colour to procure a likeness of nature as art demands.

I agree with "Free Lance" that this subject presents another distinctly fraudulent aspect, but it seems to me very difficult to draw the line where the fraud begins. May I nevertheless say of the case related, where the faces of the pictures went afterwards all black, that the blackening of a picture is not a proof that it must be necessarily a photograph painted over with oil colours. There are different causes which produce such effects, and, as the artist of the portraits was one of repute, I would rather presume the blackening was of another origin than such an ignominious fraud, and could have been, perhaps, easily restored. With sincere thanks again for your indulgence—I am, yours, &c.,

A PAINTER.

Liverpool, September 5, 1887.

Exchange Column.

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

Will exchange an eight-air musical box for an 8½×6½ tourist camera.—Address, GEORGE C. RADFORD, The Studio, Mansfield.

Studio camera, lens, and stand, tripod, and mounts in various colours and sizes, offered for limelight apparatus.—Address, F. JACKSON, 16, St. Alban's-terrace, Sherwood-street, Nottingham.

Will exchange portable dark tent, stongly made, with all fittings, for hot roller burnisher, or half-plate tourist camera, or rapid rectilinear lens.—Address, J. T. M., 26, Milo-street, Burnley, Lancashire.

I will exchange a Grubb c2 portrait lens and a Grubb A* aplanatic for a lantern and slides or whole-plate portable set complete; also a whole-plate rapid rectilinear lens for studio accessories.—Address, W. T. WHETTER, Ford House, Villiers-road, Bristol.

Whole-plate and half-plate portrait lenses, stereoscopic camera, two 12×10 dipping baths, head and body rest, rolling press for cabinets, &c.; wanted, exchange in modern outdoor apparatus with lenses for whole-plates.—Address, C. MURRAY, 4, Mulgrave-road, Sutton, Surrey.

Will exchange an interior background in good condition for a seascape or interior ditto; also, wanted, a 7½×5 or half-plate portable camera by good maker, with three or more double backs, in exchange for 10×8 ditto with one single and one double back.—Address, WHITEHOUSE, Photographer, Dolgelly, North Wales.

Camera, 8×5, with three double and one single dark slides, stereoscopic division, extra front boards, waterproof case, nine-inch landscape lens, two pairs stereoscopic lenses, namely, landscape and rectilinear; also quarter-plate camera with eight double slides and one single ditto, four, five, seven, and nine-inch landscape lenses, fitting, and mounts, with shutter; two tripod stands. Any of the above in exchange for microscopes.—Address, W. I. CHADWICK, Brooklands, Manchester.

I will exchange Grubb whole-plate A lens and a burnisher, ten-and-a-half-inch roller, gas apparatus for heating tool, for Sciopticon with four double condensers.—Address, T. H. MACKENZIE, 8, Palermo-street, Springburn, Glasgow.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED:—

G. Denny, 21, St. Sidwell-street, Exeter.—*Photograph of Exeter Theatre Royal.*

C. Watson, 4, Kirkgate, Ripon.—*Photograph of The Most Honourable the Marquis of Ripon.*

T. C. (Oldham).—It is very much a matter of taste. By both systems excellent results may be obtained when properly worked.

G. SMITH asks how to throw down the gold from old toning baths.—The gold may be precipitated simply by the addition to the bath of a solution of protosulphate of iron.

J. DUTTON.—Unless we knew how the negative was produced or what caused it to become weak and yellow it is impossible to suggest a remedy. Has it been intensified? if so, with what?

H. T. Y. asks if and where in England he can procure the *Bulletin Belge de la Photographie* and *Photographisches Archiv*.—Any of the foreign journals may be obtained through Messrs. Trübner & Co., Ludgate-hill.

A. D. R.—We know nothing more of the process than was communicated by our correspondent. If the bichloride of copper were applied before the platinum the image would be converted into chloride of silver.

ELECTRO.—1. The plan used at the Ordnance Survey Office is described on another page. That, perhaps, will answer your purpose.—2. Nothing but what is contained in works on etching and engraving, of which there are several.

L. F. C. asks: "When strengthening a gold toning bath, should thirty grains of acetate of soda be added each time to every grain of gold?"—It is not necessary to add acetate of soda each time an addition of gold is made. Some must, however, be added occasionally.

ENLARGEMENT.—Enlargements can be made equally good by gaslight as by daylight. It is only a question of duration of exposure. The condensers usually employed for concentrating the light on the stage of a theatre are not suitable for the production of photographic enlargements.

CHAS. STEPHENS.—Some portions, such as the wharf with the people on it, being sharp, and other portions, such as the steamer, being in duplicate, we infer that the steamer has moved during exposure. Examine the negative crucially and see if this be not the case. We refer to the steamboat at end of wharf.

J. PALFREY writes: "Will you be good enough to inform me what varnish or medium is used to tint albumen prints with transparent oils, or is it done with varnish colours ready prepared?"—If the print be sized with a weak solution of gelatine no other preparation is necessary. Ordinary oil colours can then be employed.

MR. W. A. WATTS desires us to correct an error which has crept into his abstract of the discussion at the last meeting of the Liverpool Amateur Photographic Association. He reported Mr. Sayce as saying that he had taken a week to develop a collodio-albumen plate, whereas he said he had seen a print from a plate which had taken a week to develop.

RETOUCHER.—Without making an analysis of the particular sample of paper we could not say. It is not made for photographic purposes, and probably the different batches may vary with regard to their applicability in photography. We have used some samples of it successfully, but have failed with others. You had better make a trial with what you have with different strengths of bath.

BATH says: "I have an old wet plate dipper bath enclosed in mahogany case which we have lately used as a fixing (hyppo) bath, the glass of which has got slightly cracked, and of course the hypo solution keeps constantly wasting; can you inform us in your next issue what would be the best packing to use to stop the leakage?"—The best plan will be to fill the space between the glass vessel and the wooden case with melted paraffine; this will prevent leakage. There is no photographic difference; they are simply trade terms for lenses possessing similar properties.

NEUCHÂTEL.—1. Messrs. Trübner & Co., Ludgate-hill, will procure it for you.—2. Bronzing of the prints may be due to more than one cause. One reason is the silver bath being too strong for the sample of paper used. A weaker bath should be employed. Over density in the negative is also a cause of bronzing.—3. We are in no way responsible for the advertisements which appear in our columns. It is certainly a great hardship that you should lose your specimens, but we fear we cannot help you. Why not write to the police authorities of the district? they may possibly know the whereabouts of the owner of the studio.

GRIMSBY.—1. If the equivalent foci of the various lenses named, or of any other lens not named, be the same, then will the sizes of the images projected on the screen be similar.—2. The same in both cases.—3. When a lens is capable of introducing a very near object then does the importance given to such near object tend to dwarf the mountains and other objects at a distance; but in every case will lenses of the same focus delineate the objects on the same scale of magnitude, although some will include a greater amount of subject than others, and, in the case of foreground, thus by contrast diminish the distance. Thanks for enclosure, which was put to the use intended and left no residues.

LOLO says: "I shall be glad to know of a reliable toning bath. I make mine in the following way:—Acetate of soda, sixty grains; water, sixteen ounces; gold, two drachms; and I am not successful. I keep it three days before using, but something goes wrong with it. I wish to obtain a purple hue. My gold solution is carefully kept from the light."—If our correspondent is really using two drachms of chloride of gold to sixty grains of acetate of soda the failure is easily accounted for. We presume, however, that two drachms of a solution containing one grain to the drachm has been employed. If this is the case the proportions are right. Perhaps the negatives are not of the right character to yield purple tones or the paper may be at fault.

A. S. writes: "How can I stain ordinary window glass a deep non-actinic red?"—2. Some time ago you told me to use liver of sulphur to throw down silver in hypo; I did as recommended. I find the water still black, although clear, and a sediment in the bottom of the tub. I suppose the sediment to be the silver thrown down; but is it necessary to get the water white to get all the silver out? Although black, it has been beautifully clear for weeks."—In reply: 1. Coat the glass with varnish or collodion in which aurine or, preferably, chrysoidine has been dissolved.—2. If a further addition of liver of sulphur does not produce turbidity the whole of the silver has been precipitated. The sediment at the bottom of the cask is sulphide of silver.

A. A. C. asks: "How many grains of gold (actual gold) are there in a fifteen-grain tube of the chloride? I have been making some of the latter according to Mr. Forrest's instructions in this year's BRITISH JOURNAL PHOTOGRAPHIC ALMANAC. He there states that a half sovereign will make one hundred and twenty grains of chloride; now, as the half sovereign weighs about sixty to sixty-one grains, this makes the reaction at variance with the atomic weights of gold and chlorine. Sixty grains of gold should, theoretically, make about ninety to ninety-two grains of the chloride. Then, again, in many fifteen-grain tubes of gold there is a printed label to the effect that the contents are guaranteed to contain seven grains of pure gold; surely they should contain ten grains of that substance. Again, if a half sovereign only really makes ninety grains it is cheaper to buy A_2Cl_3 ready made, whereas Mr. Forrest shows a saving of forty per cent. by making it at home."—In reply: It is impossible to say how many grains of gold there are in a commercial fifteen-grain tube of chloride of gold. If it be guaranteed to contain seven grains, of course it should contain that quantity. A half sovereign weighs about sixty-one grains, but it must be borne in mind that only fifty-six of this is really gold, the remainder being alloy; hence a half sovereign will yield eighty-six grains of pure chloride, the intrinsic value of which is ten shillings. However, chemically pure chloride of gold is not an article of commerce, it always contains free acid and water. If it be a double salt, say of soda or potassium and gold, then the other constituent must be estimated for. On page 805 of our volume for last year our correspondent will find an article on the subject.

REGATTA puts the following questions: "1. When paper negatives are oiled the oil spoils the resulting picture. Is there any skin or transparent film which might be placed between the sensitised paper and negative? if so, where can it be obtained, and at what price?—2. Is the process of dry plate making one which requires great skill? Must the room in which the glass is coated with the emulsion be absolutely free from all actinic light? I mean more so than an ordinary dark room. Is it cheaper in the end for an amateur to make or buy dry plates of a large size?—3. Large dry plates are sold at very high rates; are the paper negatives of recent invention sold at the same rate or cheaper than glass plates?—4. It sometimes happens when enlarging that the heat from the lantern is so excessive as to cause the film of the negative to crack or blister; how can this be avoided?—5. How should the lenses in an ordinary combination portrait tube be arranged? or, in other words, what is the order in which the lenses are placed?"—Reply: 1. A thin film of gelatine may be interposed; this will probably avert the evil. Thin sheets of gelatine may be obtained from most fancy box makers.—2. The light in the room must be perfectly non-actinic. Some little skill and judgment is required in making dry plates. With regard to the cost, this will of course depend upon the value our correspondent sets upon his time. Unless he uses a large number of plates he will find it far cheaper to purchase them than set up the appliances for making them.—3. Paper is the less costly.—4. A glass tank containing a solution of alum interposed will stop off a large amount of the heat.—5. The portrait combination should be used without alteration, but arranged so that the back lens is next the negative to be enlarged.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, September 14, 1887, will be on *Simple Cameras*. Saturday outing at Rickmansworth. Train, Moorgate-street at ten minutes past two o'clock.

A CORRESPONDENT sends us the following:—"Necessity is the mother of invention. A photographer in the north of London, suffering a drought of feeble trade and superfluity in family, while possessing but a little faded memorial card to his best and only lens, still persists in placarding his studio with an announcement, 'Children taken instantaneously.' This 'specialty,' and all other work, is made by a portrait combination consisting of a small lens from a cheap telescope mounted in a battered condensed milk tin tied to the camera by string, the whole covered from the gaze of the curious by a brown black shawl. A fact. Ye lovers of expensive lenses, please note!"

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1428. VOL. XXXIV.—SEPTEMBER 16, 1887.

AN UNSUSPECTED CAUSE OF FADING.

DURING the past year several examples of fading in silver prints, somewhat extraordinary in character, have been brought under our notice. We may, in commencing, explain that we have used the term extraordinary because, at first sight, and with the data supplied, it was difficult to account for such rapid fading as that in question. But when, however, the facts were inquired into, there was really no mystery in the matter, and a little consideration would have shown, to any one conversant with the subject, that what occurred was precisely what might have been anticipated—indeed, it could not well have been otherwise.

The particular phase of fading now in view is that where prints which have been mounted show spots in a few weeks afterwards, and in some cases even in a few days, and in a very short time this is followed by unmistakable fading generally, while corresponding prints which were left unmounted have showed no evidence of deterioration. Under ordinary conditions, the natural inference would be that the cause of the evil rested with the mounting boards, and in every case we find it has really been attributed to them. However, a careful examination in one or two cases, at least, has shown that although the mounts could not be pronounced all that could be desired, perhaps, in the way of purity, still they did not contain anything like sufficient deleterious matter to account, *per se*, for the prints fading so rapidly as they did.

Having proved that in some cases the reason for the fading could not be assigned to the mounts, the next thing was to ascertain what was the mounting material that had been employed. This solved the apparent mystery. In every case it had been glue, and that, too, of the most unsuitable kind for mounting photographs. The different samples sent us, though not identical, were all of a very similar character, and had, probably, been selected on account of their pale colour and transparent appearance. The class of glue is that sold at different shops under different names, such as Cologne glue, refined glue, extra fine glue, &c. In general appearance it is intermediate between glue and a common gelatine, and it is usually met with in cakes or flakes somewhat smaller than those of ordinary gelatine, and is, we are told, usually of foreign manufacture. It is somewhat higher in price than Scotch or French glue of the better kinds.

When soaked in cold water, each of the samples (for they all behaved very much the same) swelled up nearly as much as a good gelatine would do, and communicated to the water a by no means pleasant odour, indicating that incipient decomposition had set up during its manufacture. They each made a very adhesive solution; indeed, for the purposes to

which glue is usually employed, it was of excellent quality. On testing the solution with litmus paper it proved to be strongly acid.

A solution, made to a consistence suitable for mounting purposes, after standing a day or two became thoroughly decomposed and liquefied, and gave off a very offensive smell. This would not have been the case with a moderately good gelatine. Notwithstanding the decomposition, the solution still retained the greater portion of its adhesive properties. In this state it is, of course, far easier to use, because it has lost its setting qualities, and for this reason, as we found, it was often preferred to a solution freshly prepared. One of the samples supplied by a correspondent was the mountant itself in the condition in which it is used, and it was then in a semi-liquid state from decomposition. Of course, when this kind of material is used for mounting even carefully fixed prints on pure mounts, it is not difficult to see why they should rapidly fade. But what shall be said if the prints themselves happen to be but imperfectly fixed or washed, and at the same time the mounts contain some deleterious matter? In such cases the extreme fugitiveness of some mounted prints over corresponding ones kept unmounted is easily accounted for.

It would be a libel on photographers, or professional photograph mounters, to suggest for a moment that they would employ any such material as that alluded to. Yet we find that it is often used by those who have no practical acquaintance with photography and its requirements. Stationers and others who sell photographic scraps, often purchase the prints—those produced abroad especially—unmounted and mount them themselves as their customers require. It is such as these who have brought the subject under our notice, and in every instance they have condemned the mounts as being the cause of the fugitiveness, or the prints themselves. The subject has proved an interesting one for inquiry, as we have found, strange as it may appear, that acid and decomposed glue or gelatine is by no means unfrequently employed for mounting photographs. As we have said before, it is easy to use, and the users are apparently ignorant of the pernicious effect it must necessarily exert upon the photograph.

Now, if this kind of thing exists to any great extent—and we sincerely trust it does not—it is easy to conceive how many reputations may suffer. For example, if the prints issued by such houses as those of Bedford, Frith, Wilson, Valentine, and others, who publish prints unmounted were mounted in a similar way to those just alluded to, they could scarcely be expected to fare, in the end, any better. Furthermore, the credit of the mount maker may also suffer, for the very general

assumption, when mounted photographs fade or become spotty while corresponding ones remain unchanged, is, and usually has been, that the mounts contain something which has wrought the mischief.

Gelatine, as we have often said, is one of the best mountants that can be employed for photographs, but, of course, it must be free from impurities, and also from decomposition at the time it is used.

SULPHITES IN CONJUNCTION WITH PYRO.

I.

In response to several letters received since we wrote last week on *Pyrogallie Acid and its Preservation* we return to the subject, with a view of giving clear and explicit directions how to proceed in the matter of using the various preservatives in vogue, about which there appears to exist a good deal of uncertainty.

There is nothing at all ambiguous about the ordinary formula nor in the instructions given with regard to mixing, but a few words may be said on the subject of the usually accepted proportions of pyrogallie acid and sulphite of soda. These are one ounce of pyro to four of sulphite, and when used with a sufficient quantity of water to make a ten per cent. solution no better proportions could be adopted. But one thing must be borne in mind, namely, that it is not the proportion of sulphite to pyro that is of importance, but of sulphite to water. It appears that a certain strength of sulphite solution is needful in order to perform efficiently the duties of a preservative; it matters very little what is the strength per ounce of the pyrogallol, the sulphite should be nearly at the point of saturation, and then the solution will retain its powers as well as its freedom from colour for a very long period. Thus it will be noticed that though the stock ten per cent. solution of pyro with the corresponding proportion of sulphite will remain uncoloured, as we have said, for a lengthened period, as soon as it is diluted to developing strength it commences to oxidise and discolour, showing very clearly that when the strength of the sulphite is reduced it ceases to possess the power of protecting the pyro, though the relative proportions of the two remain unchanged.

It is important to remember this, because many operators have a fanciful way of mixing their developing solutions, being desirous apparently of acting differently from everybody else. Many individuals, for instance, of our acquaintance prefer to make their solutions not in concentrated or ten per cent. form, but just double the normal developing strength, so that by mixing equal parts the developer is ready for use. Apart from the inconvenience arising from the comparatively large bulk of solutions this entails, it is obvious that the strength of the sulphite is very far below the point of saturation, and that therefore its preservative power is very inferior, and, indeed, it is found necessary to constantly make the pyro solution fresh when required. The system, we admit, is a convenient one, but in working it it is necessary to keep the more concentrated solution as the "stock," to be diluted when needed for the working solution.

The standard strength of ten per cent. for the pyro has been selected from motives of convenience, and it may be made up with a cold saturated solution of sulphite, when the relative proportions of pyro and sulphite will be approximately 1:4. But if a stronger solution of pyro be preferred we must necessarily, though still adhering to the saturated solution, reduce

the proportion of the sulphite to pyro, and this may be done without in the slightest degree decreasing the keeping properties of the solution. On the other hand, if the strength of the stock pyro solution is to be lower than ten per cent., the sodium sulphite must still be kept as before, and consequently its proportion is increased relatively to that of pyro.

These considerations become of importance if, as many allege, sodium sulphite exercises a retarding influence on development, for obviously the smaller the quantity that will satisfactorily preserve the pyro the better will be the result, or, in other words, the more concentrated the stock solution of pyro, the less pronounced will be the ill effects, if any, of the sulphite.

We have, however, repeatedly expressed the opinion that no such retarding action exists in the case of pure sulphite, but that where it is observed it is due to the employment of a sample of that salt that has become largely converted into *sulphate*, or else to the over acidification with citric acid. Samples of sulphite vary very greatly, though they are, as a rule, much more uniform and of better quality than when the salt was first brought into general photographic use. The newly created demand apparently brought into the market a very inferior and unstable preparation, which frequently crumbled into a soft powder in a few days, even in a stoppered bottle. In strong contrast to these was a sample obtained by us from a pharmaceutical chemist, some ten years ago, for use in connexion with the hydrosulphite developer, and which remained unchanged up to two or three years ago, when we used up the last of it in testing it experimentally against a freshly made specimen. Recently the article supplied by photographic chemists has regained much of the old quality, and as a rule is to be relied upon.

Where this is the case no trouble whatever need be experienced in its use. All that is requisite is to make a hot saturated solution and allow it to cool, to render it very faintly acid, but *not* with *citric acid*, and to filter. We have a strong preference for sulphurous acid for this purpose, and it may be obtained in solution at almost any dispensing chemist's. The strongest solution obtainable has a specific gravity of about 1.045, and contains a little under ten per cent. of real acid, but the preparation obtainable at the ordinary chemist's is not likely to have that strength nor to be very uniform in quality. For the purpose of neutralising the free alkali contained in the sulphite its strength is immaterial, as litmus paper will save all troublesome calculations.

It has been shown by Admiral Mouchez (and in the *Annuaire du Bureau des Longitudes* a neat little engraving of the effect is given) how far removed from the simple operation it is usually supposed to be is the measurement of star distances upon photographic charts, and Dr. Pritchard made some observations upon the same subject at the British Association meeting. He showed that the image of a star produced under certain usual conditions consisted of a series of black dots, joined by intervals less dense. He found by experimental measurements that a bright star would be accurately represented on the plate if its image were, during the greater portion of the exposure, screened from acting upon the plate by the interposition of a stop of some kind.

Apropos of the subject of astronomical photography, it may be noted that it possesses one advantage of a very important nature over eye observations, in that the lenses of a telescope are free from the want of homogeneity of structure that distinguishes the lens of the human eye. Whatever the amplification obtained, be it small or large, the photographic plate records it accurately, while with the eye, unless

the magnification reach a certain limit, according to the focus of the object class, clear vision cannot be obtained, as rays of light would appear to be thrown out by the image, just as a bright star appears to do when viewed by the naked eye. Then, again, the extent of magnifying power that may be applied is, in the opposite direction, governed by the condition of the atmosphere. Unless the latter be very good, the highest magnifying power is unavailable; and the larger the telescope, the more frequent do such limitations interfere with its use, until with instruments on such a scale as the Lick telescope its greatest possibilities may not be utilised on more than a few nights in a year.

THE current number of *La Nature* contains an article upon dark rooms, which is illustrated by a number of neat engravings of furniture and apparatus. We have, first, a developing table showing an automatic rocker for plates; then a dark room lamp with transparent bottom allowing the light to fall upon a mirror which reflects it through the negative to the operator by the help of a dish made of clear glass. Under the notion that it is necessary to use a toning bath absolutely clear, and that the inexperienced operator would not be able to perform the operation of decanting with success, an arrangement is shown for doing this by mechanical means. The solution is contained in a jar fitted with a projecting neck at its lower part; into this neck is fitted a cork containing a glass tube bent at right angles. When the solution is not needed, the tube, which is movable, is fixed upright; but when it is desired to draw off some of the contents the tube is turned to a horizontal position, and the liquid flows out. It is in effect simply a cheap substitute for a glass tap. Finally, we have a washing trough for prints and a drying apparatus in which to suspend them, neither piece of apparatus possessing any features of novelty.

As the time is approaching when photo-micrography will again interest its votaries, we may here make a note of a method of treating polyzoa and other low forms of animal life to put them in a suitable state for being photographed. It is stated that by dropping a few crystals of chloral hydrate in water in which the polyps have been placed the creatures become insensible—narcotised in fact—and can then be placed in alcohol. It is claimed for this process that by its means the polyps may be retained as a specimen in a permanently expanded condition, by which means its full beauty of structure is exhibited.

How to blacken brasswork is a topic of perennial interest, and a query that we may always be sure of having put to us before the lapse of a long period of time. A correspondent of a scientific contemporary, writing from Chicago, repeats some old instructions, and states that the plan he recommends is superior to all others. His instructions are to dissolve a little copper wire in nitric acid, taking care to have the wire in excess; then dilute with water, apply to the brass with a brush, heat strongly until the nitrate turns black, wipe off and slightly oil.

MR. RAND. CAPRON, in his *Plea for the Rainband*, gives a full description of an instrument for weather foretelling which deserves a greater publicity than it yet appears to have had—Klinkerfue's weather compass. The compass is an ingenious combination of aneroid barometer, string hygrometer, and a wind scale, and gives its indications in a single reading, not requiring the collocation of a set of observations. The working arrangement is such that in dry-air conditions the hygrometer string acts with the aneroid for a rise, and in moist weather against it, the two instruments thus combining in a joint reading depending on the variation of each. Definite instructions for use are sent out with each instrument, with particulars for setting it according to the barometer or to the prevailing weather sign. The great sensitiveness to hygrometric changes is seen if the back of the instrument be breathed upon; the motion of the index may then be observed instantly. Such a handy little apparatus, particularly to the possessor of a pocket spectroscopic, ought to be of real service in projected photographic expeditions.

FOR the purposes of the printer who makes his own chloride of gold, and desires first to obtain the pure metal, its precipitation from

solution of waste or of alloyed gold is generally recommended to be carried out by sulphate of iron, or sometimes by oxalic acid. In a recent number of the *Chemical News* the various methods of precipitation were examined, and preference given to processes of decided novelty. The writers, Herren Hoffman and Krüss, state that by means of sulphurous acid the gold is thrown down both quickly and thoroughly. The acid, in solution, is added to the dissolved gold, and the whole heated for half an hour; at the end of the time the gold is all precipitated, and can be filtered off without delay, a rapidity which is not permissible by the ordinary means, as any one who is familiar with the process well knows. There is also avoided all trouble in getting rid of iron as in precipitation with iron salts, and all loss by spitting which may take place when oxalic acid is used, though this latter is a loss more of interest to the analyst than the photographer.

THE greatest yield of gold was obtained when freshly precipitated oxide of mercury was used. The solution is mixed with the oxide, placed in a water bath, and heated, with the result that the gold precipitate collects in the very unusual form of a gelatinous mass.

LANTERN SLIDES ON GELATINE PLATES.

I.

A FEW weeks ago, in the *JOURNAL* for August 12, Mr. W. I. Chadwick, in the course of an article on *Stereoscopic Photography*, expresses the opinion that gelatine plates are unsuitable for lantern slides, and as he is an authority on the subject, it may be worth while to inquire if, and how far, he is correct in his allegation. I may at once say for my own part, that while I believe Mr. Chadwick may be in the main accurate, so far as he goes, I do not see any reason why gelatine plates should not make, I will not say as good slides as can be got with collodion, but at least as good as many that are so produced.

It will save trouble if I quote in full the charge Mr. Chadwick makes against gelatine plates, as I can then more readily analyse it and show where the faults lie. He says—page 504—"I will go so far as to say gelatino-bromide plates of *anybody's make* (commercial ones) are unsuited for making lantern slides; they are not clear enough or transparent enough without being hard, and if you do make them soft, they are veiled and flat, and, therefore, unsuited to the lantern." This statement is clear and explicit enough, and shows precisely what the author finds fault with in gelatine plates. Coming from such a source the condemnation is very severe, and may tend to prevent many amateurs, who might otherwise do so, from using gelatine plates for the purpose, their advantage over collodion in point of rapidity being so palpable that there are few who would not employ them if the results attainable were anything like equal to collodion.

I shall endeavour shortly to point out how and why gelatine plates do fail in the respects mentioned by Mr. Chadwick, and how it is the fault of circumstances rather than of necessity; and as the lantern slide season among amateurs is approaching, I shall show them how they may economise their time and opportunities by using gelatine instead of collodion, and at the same time produce results which, except in tone, perhaps, are little inferior.

This one advantage of rapidity is, perhaps, of greater importance in lantern slide making than those who have never worked that branch of photography would imagine. The work is usually performed at the worst time of the year for light, and the amateur's hours of recreation only, as a rule, permit him to use the worst of that or else artificial light; in either case, the gain in being able to use gelatine is most appreciable. As an example of the kind of exposures given with collodion emulsion plates, I may mention that a friend of mine, a well-known and successful worker of washed collodion emulsion, both for landscape and lantern work, used to adopt the practice of setting a plate to expose in the camera for the latter purpose before starting for business in the morning, and leaving it until he reached home in the evening. Of course, for contact work, the case is very different, but how few of our negatives are suitable for printing by contact!

Well, to turn to Mr. Chadwick's charges. In the first place, he

confines his strictures to commercial plates, and though there are several makers of gelatino-bromide who send out a special plate for lantern slides, I am bound to say that on the points mentioned by Mr. Chadwick none that I have tried can come up to collodion. This is from no want of care on the part of the manufacturer, nor is it from any want of capacity on the part of gelatine to give clearness and transparency in conjunction with softness, but it is rather, to my mind, the effect of working upon a commercial rather than upon a small scale. What I mean is, that where the very highest perfection is required, it is impossible, working on a commercial scale, to give that minute and, so to say, individual care to little matters that an amateur can who is working small quantities for his own use; it is on the same principle that the private tutor produces better results in special cases than class teaching. As regards the qualities of sensitiveness, and especially uniformity, no doubt the large maker has greatly the advantage of the amateur, but in the matter of mechanical perfection the latter, I think, has the best of it. Referring to this very point, one of our largest commercial plate makers remarked to me some years ago, "Your plates ought to be immaculate."

For a moment we will set on one side the chemical part of the question, and consider only the physical differences between collodion and gelatine. Take a film of plain collodion and one of gelatine of the strength ordinarily employed in emulsion, and compare the two. The collodion when dried upon glass exhibits to the eye not the slightest sign of its presence either by colour or structure. Under the microscope, no doubt, it does show a strongly marked structural character, but the power necessary is infinitely greater than any that is brought to bear by the lantern. Take the dried gelatine film, however, and it will be seen that though, perhaps, perfectly colourless in the extremely thin layer it presents, it is distinctly visible to the eye from the "varnishy" sort of surface it possesses, and the innumerable, excessively minute specks formed in the film in drying, and resembling the pores of the skin. I am speaking of a layer of gelatine which has been dissolved in distilled water and filtered through filter paper, and not to one in which mechanical defects from dust and similar causes exist.

Such a film, when held before the eye, though it may possess no appreciable colour, and be practically as transparent as glass, produces the same effect upon objects seen through it that a poor quality of window glass does, and cannot, therefore, be an improvement to the definition of an image formed upon or in it. The intensity of the defect varies with different kinds of gelatine, and with the quantity used—the harder kinds, and especially these liable to the fault known as "pitting," being the worst offenders; but many of these are otherwise among the best that can be employed on account of their clearness and freedom from colour. The softer gelatines, and especially natural isinglass obtained direct from the dried swimming-bladder of the sturgeon, are the best in point of freedom from structure, but their slowness in setting and liability to frill and dissolve in development are great objections. The isinglass, too, possesses a peculiarity which can scarcely be looked upon as an advantage; the dried flakes, when placed to soak in water, exhibit a beautiful play of iridescent, nacreous colours like mother-of-pearl, and after solution, and when the jelly has set, these colours are transformed into a pale opaline tint almost fluorescent in its character.

This fault may be considered a purely mechanical one, but the next I shall mention partakes of a physico-chemical character, the result being produced by chemical means, though partly induced by the physical nature of the gelatine. Most, if not all, gelatines contain lime, either as an essential element in their composition or contracted in the process of manufacture. Some of the hardest and whitest samples are the worst in this respect, being very strongly contaminated with lime. So long, however, as the lime is present in a soluble form, its presence is of little moment, but as soon as it is converted into any of the insoluble forms, as oxide, carbonate, oxalate, citrate, or sulphate of calcium, it makes itself unpleasantly apparent by the opalescence it gives to the gelatine. When once transformed into the insoluble condition in the body of the gelatine, it is almost impossible to completely eliminate it; dilute hydrochloric or nitric acid will remove some of the opalescence, but not all, and here is one more cause of the diminished clearness and transparency of gelatine films.

Among the causes that may intensify this form of defect may be

mentioned contact with caustic or carbonated alkalies, which by separating the lime in the form of oxide or carbonate from the soluble calcium salt converts it into the objectionable form. In development, therefore, we may always expect to create a certain amount of opalescence if the gelatine be strongly charged with calcium salts, provided the precipitation has not occurred earlier, for another strong cause of this reduction is found in prolonged contact with ordinary spring or tap water and its impurities. If the gelatine of which an emulsion is made contains soluble calcium salts and it be washed in ordinary water, the result will be a reaction in which those salts are rendered insoluble by the action of the carbonates and sulphates contained in the water, and, in addition, a further supply of lime and probably also of baryta is derived from the water itself.

With an emulsion made by the ordinary methods of boiling or digestion, the degree of opalescence thus created is not very great, and certainly not sufficient to injuriously affect the plates for negative purposes, though it mars the clearness of a lantern slide. But if we turn to an emulsion made with ammonia the case is far different, and the opalescence in that case may become a matter of serious objection, even in a negative; for under these circumstances the ammonia acts as a sort of trap for the lime contained in the washing water, throwing it down in the insoluble form in the mass of emulsion itself, and were it not that it is to a great extent soluble in the fixing bath, the deposit of lime thus obtained would entirely destroy the transparency of the negative. Some time ago, when experimenting with a formula in which a carbonate was used instead of ammonia for giving sensitiveness, I was so struck with this peculiarity that I tried to utilise it for the production of matt surface transparencies, to do away with the necessity for ground-glass.

It follows from what I have said, that the amateur who wishes to make gelatine plates that will be suitable for lantern slides, must most carefully select his gelatine in the first place, must free it from all mechanical faults by thorough filtration, and avoid using too thick a film, and so introducing other mechanical defects. He must also so arrange his methods of treating the emulsion, that as far as possible the deposition of insoluble lime in the gelatine is prevented, and the brightness and transparency of the emulsion retained intact. It is here that the amateur has the advantage over the large manufacturer, for he can, by using distilled water for every operation, or by utilising one or other of the precipitation processes of emulsification scarcely available on a commercial scale, avoid entirely the access of lime to the emulsion during the process of manufacture.

I now come to the last portion of Mr. Chadwick's charge, namely, that gelatine transparencies "are not clear enough or transparent enough without being hard, and if you do make them soft they are veiled and flat." I must say that such has not been my experience with gelatine plates, commercial or otherwise, that have been specially made for transparency purposes; but I am quite prepared to endorse it if Mr. Chadwick is referring, as I think he must be, to the ordinary commercial landscape plate. The fact is that if you want a gelatine plate that will make good transparencies, you must prepare it specially. It is not a debatable point, or a mere question of taste or opinion as in the case of slow *versus* rapid plates for general work, but it is a downright and incontrovertible fact that rapid plates from their very nature will not make clear and soft transparencies. The sensitive film is in such a delicate state of equilibrium that the exposure and development necessary to produce half tone and softness cannot stop short of veiling the shadows, the line of demarcation is too fine, the plate too delicate for the treatment. In fact, to obtain clear shadows you must under expose and so lose softness, or else sacrifice clearness to harmony, in either of which cases the result must be inferior.

How far those manufacturers who supply a special lantern plate modify their ordinary methods of working in their production I am unable to say, but I am convinced that by adopting every precaution and working carefully upon a small scale, a better result can be obtained than any I have yet met with; and I shall endeavour, in another article, to give clear working details, both as to formulæ and methods of treatment. Though, be it understood, I do not promise better results from gelatine than can be got with collodion, still in view of the immensely greater rapidity of gelatine, the amateur will find it conduce to his convenience to employ it in preference.

The emulsions I shall describe constitute what would be termed

"slow," when speaking of gelatine, though still many times more rapid than collodion, especially in a bad light; and they have this additional advantage, in virtue of their slowness, that they are easier to prepare and require fewer precautions than the more rapid forms, and hence may be attempted by those who have not hitherto taken up emulsion making.

W. B. BOLTON.

CAMERA MAKING IN JAPAN.

In considering what to write home from a foreign land, one can only assume that what has interested oneself will interest others. It is on this assumption that I write about camera making in Japan. I take, myself, a very great interest in observing the use of tools of almost any kind, and in noticing the difference in the method of use by different people; and as the manner in which the Japanese use many tools is totally different from anything I have been accustomed to see, it has been particularly interesting to me.

The excursion to the camera maker was made in the following circumstances. An officer of one of the American men-of-war in Jedo harbour, having called and introduced himself as an amateur photographer, mentioned that he was having a camera made by Japanese workmen. We decided to go to the workshop and see how the work was progressing, so we made our way to the Regent-street of Tokio—the "Shimbashi," I think it is called, but Japanese names will not stick in my head. Here was the dealer's shop. Most Japanese shops occupy the front part of the ground-floor—which is frequently the only floor, the houses being two storeys high at the most. The shop is separated from the street only by sliding shutters which are removed in the daytime, leaving the whole front quite open. The floor is raised about eighteen inches from the ground; it is covered with straw mats, the lighter wares are piled on it, others are stacked round the sides. On the mats sit (or rather "squat," as I described in a previous communication) the whole of the family, every member, as a rule, engaged in some kind of work, for the selling shop is generally the workshop, too, and what is to be sold is made on the premises. This particular shop is an exception, however—there is a workshop separate from it.

The dealer has a stock that would do very fair credit to a provincial dealer in England. He has a particularly good selection of lenses, amongst them a portrait lens, the largest but one that I have ever seen. It is only a six-inch lens, but the brasswork is disproportionately massive. It is of the old-fashioned, very long focus, and is, altogether, a colossal instrument. It is by a French maker quite unknown to me, and as the dealer wants 20*l.* for it, I fear it may be on his hands for a very long time. If, however, any English photographer has a desire to purchase it, I do not mind acting as his agent.

I first attempt to transact a little piece of business of my own. I have left the flange of one of my lenses in England. Has the dealer got one that will fit my lens, or will he make one? Our attempts to express this sentiment in Japanese—with much use of a vocabulary—result merely in "arimasen," uttered with great politeness. This means that he has not got what I want, and we are both equally incapable of explaining—even with the assistance of the vocabulary—that if he has not got one he might make one. We are relieved of our difficulty by one of the University students, who, passing at the time, consents to act as interpreter. The dealer says he can make a flange, but adds, with becoming modesty, that he will do it very badly, and that it will take him a fortnight to do. It has taken him more than a month, but I must say, to his credit, that he has made a very good flange. Moreover, he has charged only half-a-crown for his month's work.

The business in the store finished, we make our way to the workshop. It is on the first floor, up a flight of steps which are something between a ladder and a staircase, and which it would be remarkably easy to fall down.

The workshop is a room perhaps twenty feet square, the floor all covered with straw mats. We are accommodated with chairs. This is an unexpected and certainly a pleasant advantage. We had looked to sitting on the floor, and accommodating our lower limbs as best we could.

And now to give some idea of the manner of working, if possible. There are four carpenters in the shop; each squats on the floor with his bench—or what takes the place of the bench—and his smoking gear beside him.

The bench is nothing more than a flat board of hard wood, the dimensions some three or four feet long, about eighteen inches wide, and an inch thick. It lies directly on the straw mats. The smoking gear consists of a stoneware bowl, which is filled with wood ash, in the centre of which a few embers of charcoal are kept always alight. The bowl stands in a square box, in one corner of which also stands a

short piece of bamboo, into which is knocked the tobacco ash after smoking. The pipe has a wooden stem and a metal mouthpiece and bowl, the latter very diminutive. A pinch of tobacco is put into the bowl, the bowl is thrust amongst the live embers, a single puff, or at most two, are taken, the ash is knocked out of the pipe into the bamboo pot, and the smoke is over. The tobacco is the very mildest and is cut exceedingly fine. I think no Japanese workman is ever without this smoking gear. In his work he pauses every few minutes, takes his smoke as I have described very deliberately, then returns to his occupation. The smoke is by no means unpleasant, but would certainly be too mild to satisfy certain photographers at home that I could mention.

The bench has no arrangement whatever for fixing the work. It is merely the board of wood that I have described, without any addition whatever. That work should be turned out, on such a bench, of a quality to rival all but the very finest camera work at home, is a thing I certainly should not have believed unless I had seen it. One thing which enables a Japanese carpenter to get on without any arrangement for fixing his work is that he uses his feet as well as his hands.

It is doubtless mostly due to practice, but also in great measure to the foot-gear used by the Japanese, that they can use their toes to grip in a manner which Europeans could not imitate at all. The foot-gear consists either of straw sandals or wooden clogs—the latter generally mere thick slabs of hard wood—which are held on the feet each by a thick cord which passes up between the big toe and the one next to it, bifurcates just over the toes, and joins the sandal or clog again at each side of the heel. The foot is thus never cramped or distorted as with us, and the toes can be freely used. A Japanese tailor holds his cloth with his toes, and a carpenter holds and turns about his wood with his feet. I was about to say that he manipulated it, but this, I presume, would not be allowable.

The tools are much more simple than ours. The hammer is merely a cylindrical mass of iron with a transverse round hole through which the handle passes. The saw is merely a strip of steel with serrated edge, and with a "tang" whereby it is fixed into a round handle like a chisel handle, much as we fix a file at home. The work is done by the upward or drawing stroke.

The plane is, in general form, somewhat like ours, but the wooden portion is much thinner—shallower from top to bottom—and the knife is inserted much nearer one end than with us. It is unlike our planes in that there is no second adjustable iron, and that there is no wedge for fixing the iron. The iron is just in the form of a chisel, and is held in position by friction against the sides. With the plane, as with the saw, the work is done by pulling or drawing, not by pushing. The knife is fixed near the end which goes in advance as the plane is drawn along. One would suppose that with such a primitive tool only rough work could be done, but the very reverse is the case. I have seen a Japanese carpenter do what anyone who has ever practised carpentry will know is by no means an easy thing. I have seen him take out of the middle of a board of hard wood a thin, delicate shaving several feet long and the whole width of the plane iron. One reason, perhaps, why such good work is done with the Japanese plane is, that unless the edge of the knife is kept in very good condition the tool will not work at all. It is, therefore, kept as sharp as a razor, a deal of time being consumed in the very frequent setting of it.

One result of the simple construction of the Japanese plane is that a carpenter thinks nothing of making a special plane for any piece of moulding or such like work that he may have to do. These are sometimes very minute. I have seen them only about an inch and a half long, and three-eighths of an inch wide. It thus comes that much of the work done by us with gauges, chisels, &c., is done by the Japanese with the plane.

None of the other tools that I noticed differed greatly from those used at home, except in being rougher and less finished in appearance.

The work that was being done was merely the exact copying of an English camera and dark slides. At work of this kind the Japanese are very clever, but they appear to have but little capacity for original mechanical contrivance. They, moreover, have very little idea of saving labour by machinery, or of division of labour. The consequences are that, although they turn out work of the kind that I have been describing cheaply—the camera was to cost about one half what it would cost at home—they would turn it out no more cheaply if goods were manufactured on a large scale. If a thousand dark slides were to be made, each one would be made precisely as the first, one workman doing the whole of the work.

It is probably due to this very fact—to the fact that the Japanese use little or no machinery, and that, as a rule, an article is made from beginning to end by one individual—that we owe the indefinable

artistic charm which there is in the commonest product of Japanese labour. It is because each article has something of the individuality of the worker in it.

The camera maker thought it his duty to keep us entertained as we watched the progress of the work, and brought up to us, one at a time, what he considered the greatest treasures of his store. He brought first a fine and very large musical box. It was of French make, but set to play Japanese airs—or music rather, for I have failed as yet to find any approach to air or melody in the Japanese singing or playing. He next produced a Hall type-writer, afterwards various other mechanical toys for our amusement.

The bellows of the camera was being pressed in the selling shop by the simple expedient of piling lithographic stones on the top of it to a height of some four or five feet.

We are already here beginning to look forward to the eclipse, which will be total in great part of Japan. I hope to be at one of the observation stations, and to have something to tell English readers of what goes on.

W. K. BURTON.

HOW TO MANIPULATE THE CAMERA IN A MILITARY MANNER.

[A Communication to the Birkenhead Photographic Association.]

IN 1858 the dying embers of the Bourbon race as Kings of France were gradually fading out of view, caused by the rebrichtening lustre of Napoleon III.

Prince de Jonville published a pamphlet on the invasion of England. This was intended as a sop to the vanity of the French people, and a leaf out of the book of the First Napoleon. The only effect it had was to rouse the "nation of shopkeepers" to a sense of their insecurity. The British nation suddenly awoke, and their force of action was altogether independent of statesmen or legislators. Local corps of volunteers sprung up in every quarter of the country, calling upon Government to give them instruction in the use of instruments of war, and coupling it with a motto that "Defence, not Defiance" was their aim. "The Auxiliary Forces" have now taken root, existing for no less a period than thirty years, and may be said to be a permanent institution.

In the month of May, 1859, I became a member of the First Cheshire Volunteers, and underwent the process of drill, and in the course of a few weeks afterwards had the honour to present arms to the Queen and Prince Albert as they passed through Chester to the seat of the late Lord Penrhyn. I was then an ardent disciple of the colloid process. During the Crimean War in 1854, Government sent out Mr. Fenton to photograph the scenes of the war, and his pictures sent home gave a vivid idea of what a terrible thing war really was. For forty years peace had lulled us to a false repose, and the old veterans of the age of the First Napoleon with their experience had nearly died out. We found we had the men, but we had lost our Wellingtons and our Nelsons as leaders of a heroic band. In later periods, the Americans, during their war, made the camera do great and good work. Mr. Skaife, an enterprising inventor, about the same time brought out a Pistolgraph that gave pictures one inch square—enlargements were not much in vogue in those days—and after a short popularity it died amidst a galaxy of attractive novelties.

Military drill has two advantages in a photographic sense: firstly, its exercise of judging distances; secondly, rifle drill up to three hundred yards from the shoulder, and, after this distance, in kneeling position—thus giving a firm set to the body in process of firing. There are also considerable advantages in looking steady at the target before raising the rifle to the shoulder.

Now to carry this out photographically with the camera, having undergone the necessary drill, you must provide yourself with a "finder," which almost every amateur possesses, on the focussing glass of which you must draw lines in squares, so that each square will represent one square inch of the sensitive plate, keeping the centre object as the centre of the picture, having previously engraved on the flat rack of your camera the exact points of focus, say, up to thirty yards, for after that there is truly no focus. Lock the distance determined upon with the thumbscrew of the horizontal bar, uncover the dark slide, shoulder the camera, observe the focus of the finder and the relative size of the picture to the squares already described, and fire your Kershaw shutter, or any other of a light character, and the object is secured.

Rifle practice beyond three hundred yards is carried out by resting the body upon the heel of the right foot, with the elbow placed upon the left knee. This position is irksome at first, but perseverance will ultimately enable you to do it with ease and with the utmost promptitude. This position gives great rigidity and steadiness during the operation of exposure.

To obtain all the advantages of rifle practice, I fix the "butt" of the rifle to the under portion of the camera (through the ordinary stand screw); this beds itself into the shoulder, at the same time giving something for the hand to grip firmly, thus ensuring steadiness of aim, and does not require any alteration of the camera for general work.

It is almost unnecessary to state this plan ignores camera legs. The only additional article you require is an old rifle stock, which can be easily and quickly removed when required and placed in an outside pocket.

I would recommend camera drill as a health developer.

JAS. ALEX. FORREST.

PAPER WARFARE.

SINCE Mr. J. Gale's sorrowful lamentation (vol. xxx., page 4), that "with the ordinary silver printing on albumenised paper" he quite failed "to get the exquisite delicacies that make up the image on the negative," and his enunciation of the curious doctrine that "the beauty of the finished print is not proportionate to that of the finished negative," much has been done in the apparent endeavour to provide "a process," again quoting the hero of the famous "Swallows," "by which all the beauty and detail of the negative can be reproduced and retained in the finished print—a process by which we can print to the required depth and then stop, and tone to the desired colour and there finish off, without fear of the results of all our care and skill being rendered null and void in the after processes." This lamentation rent the air nearly five years ago. In the *interim*, platinotype, which not even the engineers of rival products will deny is "a process by which all the detail" (if not the beauty) "of the negative can be reproduced and retained in the finished print," has been skilfully lifted from the cold shade of neglect in which it then, comparatively speaking, languished, and manoeuvred into a commercial success. Now I think I am correct in saying that Mr. Gale's *forte* is landscape, for which the last mentioned process is, in the estimation of many, principally adapted; consequently Mr. Gale's opinion of platinotype in relation to his ideal process would be of peculiar interest. So also would Mr. Gale's present opinion of the aforesaid lament, seeing that despite such an emphatic expression of dissatisfaction with silver printing upon albumenised paper in January, 1883, he still patronises it, and presumably finds that it fulfils his purpose passing well, in 1887.

There are always a number of people about who are anxious to pull a thing down because it happens to be standing up. I select Mr. Gale's case at random, and, as the legal fraternity say, without prejudice. He is one of many who have made an Aunt Sally of an old and tried favourite without, happily, doing any damage. Albumenised paper has been with us for thirty years, and there have been almost as many revolutions (?) in contact printing. Estimating the probabilities of the future by past occurrences, I don't think these eccentric epidemics are yet stamped out—on the contrary, I fancy the malady is likely to take a more aggravated form in the near by-and-by. During the *lustrum* that has passed since Mr. Gale's lament, the burial service has been read over home and ready sensitised paper on an average once every three months by different celebrants, and still, to quote the bard, it rises Phoenix-like from the *sc*. Writing in strict chronological order, M. Hutinet's gelatino-chloride paper was one of the first to fling down the glove. This process gave exquisite results under a portrait negative, and it is a surprise to me that it has not survived. Then came an Acme paper, likewise an Alpha ditto—both, I believe, gelatino-chloride papers. Of the former we learned little, except that it precipitately swelled the bills of infant mortality, and the latter only survived till the summer time, when it gave up the ghost on account of a glut of sunshine in the meteorological market, and its inability to exist in any but an artificial light. It has recently been resuscitated, but with scarcely the success necessary to bolster up the prediction advanced at the first public demonstration of the process that it would pulverise poor old Albumen in double quick time. In the words of the dramatists, a year elapses and another revolution in contact printing surfaces occurs, for in the winter of 1884-5 (how odd it is that these revolutions generally take place in the winter!) an eminent firm gave us the fruition of their experiments in the shape of an excellent gelatino-chloride paper, whereupon the albumen *culte* began to look blue. To-day, however, the old horse is still travelling; whilst upon a cursory glance round the trade I do not find this particular new rapid, *sc*., on the market. Another interval of a year and film photography appeared, bringing in its train two or three gelatino-bromide papers; and at this moment others are *en route*. These papers are in little or no request for commercial portrait and landscape contact printing—in which connexion, be it understood, I wish my remarks to be considered.

Supplementary to those variations of the rusty device of coating paper with gelatino-chloride or bromide of silver for positive results, are Dr. Liesegang's collodio-chloride, and the late Herr Obernetter's gelatino-chloride, processes, both of which are popular in Germany, although they have only a handful of disciples over here. It will thus be seen that, commencing with the awe-inspiring platinotype and finishing with the Obernetter paper (the formula for which it is to be hoped is not buried with its regretted maker), albumenised paper has had a formidable lot to "take on," excluding from the reckoning many minor processes. It has come out of the conflict with credit, if not glory; it is still game; and, to conclude the allegory in the refined and courtly parlance of the ring, I think it worth standing against the field to a good sum.

Abandoning frivolous and free metaphor, however, it requires little boldness to assert that from the point of view of public taste, sensitised albumenised is by far the most popular paper in commerce. Into its technical merits and demerits, and those of its competitors, I shall not go; that has been done thousands of times already by abler pens, while the entire subject of negative printing was incidentally submitted to a severe canvass in the course of the great permanency tournament held not long ago. I simply scan the matter from the platform of the disinterested critic. Yet, as what I am writing will to some appear mere froth unless flavoured with the essence of an opinion, I must confess that I rank myself among those stupid old fogeys who, if called upon to make a choice, think nothing can beat a good silver print; the sentiment of which, I hope, is plain, even though the language is a bit crusty. It seems to me that the motley tribe of new rapid, &c., papers depends for patronage entirely upon amateur workers. An intimate acquaintance with the economy of many studies supports me in the companion belief that professional, and through them the paying public, eye them with scant favour. Good albumen prints boast an attribute dear to the heart of a discriminating sinner which neither the sacred platinotype nor gelatino-bromide possess, viz., richness and range of tone, in which respect the several introductions that have been going to sweep albumen off the face of the earth have shown, and continue to show, singular poverty.

On a former occasion, when the paper support for gelatino negative emulsion was heralded with such a blare of trumpets, I donned the prophet's mantle. My success has been so agreeable that I am induced to consult the stars once more, and predict a Methuselahic career for albumenised paper. It has most, but not much, to fear from platinotype, thanks, in a small degree, to protective restrictions and other causes. It should never be forgotten that the success of a photograph depends upon the quality of the negative and the skill of the printer, which, though a truism, gains rather than loses by repetition. There is no reason why the beauty of the finished print should not be proportionate to the beauty of the finished negative—no reason, that is, except the incapacity of the printer. I take it that while makers of ready sensitised paper are willing to guarantee its quality, they do not include a supply of brains at the same price. Perhaps that is the reason we have so many revolutions in contact printing. Who knows? What great events, &c. The wish, I suppose, being father to the thought, we are frequently assured that less sensitised albumenised paper is sold than heretofore. The reverse is the fact. Also constant reference is made to the jealously-guarded "secret" of the preservative employed. To paraphrase Mrs. Betsy Prig, "I don't believe there's no such thing." The real secret is that there is no secret, or, at least, not one of greater mystery than the right salt for the albumen, or the correct acidification after flotation on the nitrate bath.

There is an old saying that the public like warm and purple tones. Albumenised paper alone gives them satisfactorily. It is just as certain that professional workers have a decided preference for a printing out contact paper. In most of the new rapid series the image is developed up, which is a disadvantage, as anybody who can gauge the difficulties attendant upon the nice operation of exposure will allow. Just as in negative taking I regard magnesium, electricity, and every artificial illuminant as merely fanciful substitutes for the solar rays, so in regard to gaslight, lamplight, &c., for direct contact printing, I do not believe they will ever be treated other than as occasional makeshifts for daylight. You may deride the latter as you like, but it "whips" all artificial lights in point of cheapness and economy, and if not always available between sunrise and sunset in big towns, that is owing to our terrific consumption of coal, the bad effects from which the Smoke Abatement Society are going to obviate in due course, so that we may confidently look forward to beholding the apotheosis of poor, persecuted albumen within a measurable distance of time. The lately Japan-ed Mr. W. K. Burton was a staunch friend of albumen, and as I close this article I am reminded

of one from his pen that appeared in the last ALMANAC, wherein he remarks, *inter alia*, "It seems altogether impossible to get on without our old friend albumenised paper. Times out of number it has been decreed that he shall be banished the country, but still we have him with us, and I believe that in spite of its many rivals it is produced on a larger scale than it ever has been since it was first used." Very true; and I, if I may go a step further, believe that, taken as a body, photographers do not wish to "get on without him," and that unless the usual revolution in contact printing which will, of course, occur during the approaching winter eventuates differently to its numerous predecessors, they are not likely to make the attempt yet awhile. Naturally there is a moral to be culled from these depressing failures to oust albumenised paper from its pride of place. It is, Never be cocksure of anything. To many impulsive seers among us a retrospect of the dogmatic utterances of the past five years would be alike instructive and profitable. We have so often been fooled in the matter of these revolutions that when the next one is announced the revolutionary must not be surprised if the salt-box is in considerable request, and, what with scepticism on the one hand and icy indifference on the other, he finds himself between the devil and the deep sea.

MANSTON MOORE.

CHARTERHOUSE SCIENCE AND ART SCHOOLS AND LITERARY INSTITUTE.

THE Winter Session of this, one of the largest Science and Art Schools in the United Kingdom, will commence on Saturday, October 1, under the Presidency of the Rev. Henry Swann, M.A. During the late session about 950 students, mostly elementary teachers, availed themselves of the privileges afforded by this Institution, and of this number upwards of 650 presented themselves for examination and were successful in obtaining a large number of First Class Certificates and also a goodly number of First and Second Class Honors Certificates awarded by the Science and Art Department of South Kensington. Of eight students prepared for the Lond. B.Sc. (Int.) examination, only one student failed, the others highly distinguished themselves. Instruction of a practical character is given in most of the sciences at a very nominal fee; whilst in art at an equally low rate, students, under the direction of five competent instructors, can be advanced in their studies. Those who have leisure can at a very moderate charge attend the day classes in art. Day classes will also be held to prepare candidates for Matriculation (Lond.), the Clerical, Medical (including Dental), Legal, and other Exams. Students who aim at becoming proficient in Chemistry (organic and inorganic) have the opportunity of working in a well-fitted laboratory, capable of accommodating sixty students. Aspirants of University Honors can, at a small expense, be assisted in their studies. Classes for Matriculation, Latin, Greek, French, German, Music, and Shorthand, are taught by well qualified teachers. Opportunities for the study of Photography and Watch-making will be continued this session. Full particulars of the classes may be obtained from C. Smith, Organizing Secretary.

PHOTOGRAPHY IN NATURAL COLOURS.

FROM time to time notices appear in the daily newspapers announcing the discovery of a process for taking photographs in natural colours, and accompanied by editorial remarks about the march of civilisation and the gigantic strides of the human intellect in these modern times. Lately, both Cellier's and Mayall's processes have received such recognition, but the methods of these two inventors only result in the production of pictures artificially coloured by the operator, and these colours are not produced by photographic action. The first observations on record in relation to photography in natural colours were made by Dr. Seebeck, of Jena, who wrote an article for Goethe's *Farbenlehre*, published in 1810, of which the following is a brief translation:—

"When I directed the spectrum of a faultless prism (so placed that the incident angle of the front became equal to the refracting angle of the back) on white chloride of silver spread upon paper and still wet, through an opening of about five to six lines in the shutter, and to the distance where the yellow just meets with blue, and kept it by a proper arrangement in this position from fifteen to twenty minutes, I found the chloride of silver changed as follows: It had become red-brown in the violet (occasionally more violet, at other times more blue), and this colouration reached also beyond the line of the violet designated before, but was not deeper than in the violet. In the blue of the spectrum the chloride of silver became true blue, and this colour decreasing and gradually getting lighter, extended into the green. In the yellow I found the chloride of silver mostly unchanged; sometimes it appeared to me more yellow than before; however, in the red, and often a little beyond the red, it had taken the red of a rose."

The early workers in photography, Niépce, Daguerre, and Fox Talbot, sometimes noticed local colouration in their photographs, and occasion-

ally of such a description as to give rise to belief that a tendency existed to reproduce natural colours. This mist began to clear away from this subject when it was taken up by Sir John Herschel, the first trained man of science who occupied himself with photography, and who discovered some of its laws and principles as accepted at the present day. He, like many other photographers, appears to have been unaware of the observations of Seebeck. In a letter to the British Association, dated Slough, August 28, 1839, and published in the *Athenæum* of September 21, 1839, Sir John Herschel said:—

“When a slip of sensitive paper is exposed to a highly concentrated spectrum, a picture of it is rapidly impressed on the paper—not merely in black, but in colours; a fact which I ascertained nearly two months ago, and which observation seems to have been alluded to (though in terms somewhat equivocal) by M. Arago, in his account of Daguerre's process. In order to understand what follows it will be necessary to describe the colours so depicted. The red is tolerably vivid, but is rather of a brick colour than a pure prismatic red. And what is remarkable, its termination falls materially short of the visible termination of the spectrum. The green is of a sombre metallic hue, the blue still more so, and rapidly passing into blackness. The yellow is deficient.”

A few months later, in a paper contributed to the Royal Society, and read on February 20, 1840, Sir John Herschel went farther into details. He stated that he had been trying experiments to discover the influence of the solar spectrum upon photographic preparations, and in using a paper prepared upon principles laid down by Fox Talbot obtained indications of the photographing of colours; the paper, he said, was prepared with the following series of washes:—Firstly, nitrate of silver, s.g. = 1.096 (say 1.1); secondly, muriate of soda, 1 of salt + 19 of water; thirdly, nitrate of silver, s.g. 1.132 (say 1.15), saturating the muriatic solution with chloride of silver, and occasionally dividing the last application into two washes of equal strength by dilution. When throwing an intense spectrum upon this paper, the extreme and mean red rays impressed no colour, the orange rays a faint brick-red, the orange-yellow rays a brick-red pretty strong, the yellow rays red passing into green, the yellow-green rays dull bottle-green, the green rays dull bottle-green passing into bluish, the blue-green rays very sombre blue, passing into black, the blue rays black, and with long exposure a somewhat metallic yellow, the violet rays much the same as the blue rays, and the ultra-violet rays violet-black or purplish-black. He said that these results pointed in the direction of “the possible future production of naturally coloured photographic images.” After another experiment with a more perfect and intense spectrum, he said that the paper was coloured with “sombre but unequivocal tints, imitating those of the spectrum itself.” The papers could not be fixed, but could be half fixed by washing in water; the colours also deepened a little within the first few days after the photograph had been taken. His conclusion that these hues bore reference to the possible production of natural colours by photography was not generally accepted at the time, and Biot forthwith argued that the taking of photographs in natural colours was of necessity an impossibility.

In 1844 Robert Hunt stated, in the first edition of his work entitled *Researches on Light*, that fluoride of silver had a tendency to reproduce the colours of the spectrum. He says of one of his photographs, then two months old: “A yellow line distinctly marks the space occupied by the yellow ray, and a green band the space of the green; through the blue and indigo region the colour is an intense blue, and over the violet a ruddy brown.”

In the next step, photography in natural colours reached much firmer ground. Edmond Becquerel, in a communication to the French Academy of Sciences, dated February 7, 1848, called attention to the experiments of Seebeck and Herschel, and stated that he himself had found that the effects were best obtained with well-washed chloride of silver mixed with a little gum in order to distribute it over paper, and he thought that the nitrate of silver in excess used by Sir John Herschel interfered with the results. Becquerel discovered that if the argentic chloride film were first exposed to weak diffused light until it became of a faint violet colour, and were then submitted to the action of the spectrum, it took on a well-marked blue in the blue rays, and a rose colour in the red; in the yellow it was bleached, and the same film gave a beautiful blue, with no trace of violet, under glass. This encouraged Becquerel to additional research. He placed a polished plate of silver in chlorine water for several minutes, until it took a white tint, and when exposed to the action of the spectrum it reproduced the colours thereof, but not quite in the positions where the particular colours fell upon the plate. The orange came out well, and the green near the D line of the spectrum; the red had a purplish hue, the green was well marked near F, where the photographic impression began to pass into blue, the violet appeared near G and extended to about H. With longer exposure the colours grew deeper, but after an hour or two of exposure the colours disappeared, and the whole image took a metallic lustre. He found it difficult to prepare these plates with an even film; several short immersions gave the best results, and the plate was at its best when it assumed a faint rose colour. Becquerel then tried other ways of preparing the plates, and in one of them substituted cupric chloride for chlorine water, but finally obtained his best results by connecting the plate with the positive pole of a battery, and throwing down chlorine upon it from a weak solution of hydrochloric acid. The plates gave colours beyond the limits of the visible spectrum, and Becquerel remarked that it would be

necessary to get rid of or to absorb such rays in attempting to take photographs in natural colours in the camera. In trying to print coloured designs from paper upon his sensitive plates, he could photograph only some of the colours. He came to the conclusion that the film upon his plates was not pure chloride of silver, but a mixture of chloride and subchloride, and supported this view by means of chemical tests. He was, however, unable to fix his coloured photographs. They appeared to keep well in the dark, but were destroyed by the action of light. His first memoir on the subject containing the foregoing particulars was published in the *Annales de Chimie et de Physique*, Third Series; vol. xxii. Paris, 1848. In another memoir published in the *Annales de Chimie*, 1849, vol. xxv., Becquerel states that after trying cupric and other chlorides, also various hypochlorites, he found that nothing gave him better results than throwing down nascent chlorine upon the plate by voltaic action in water acidulated with hydrochloric acid. Although in these different ways only chloride of silver is formed, the films produced are not acted upon in like manner by light. For instance, the film obtained in very dilute cupric chloride gives a white colour under the influence of white light, but it will not give all the colours of the spectrum. To prepare a plate of about twenty-five square centimetres, the current from two feeble charged Bunsen's cells is used; the solution consists of 125 cubic centimetres of hydrochloric acid to each litre of distilled water. The surface of the plate is made chemically clean before immersion. A platinum plate is connected with the negative pole of the battery. The operation should be carried on in a place feebly lighted. First the surface of the silver turns grey, then in succession yellow, bluish, and green; then grey, rose, and violet; then blue a second time; and the operation has to be stopped just before the second blue stage is reached. The plate is then washed with distilled water, and dried above an alcohol flame. When thus prepared, it should have a violet colour. The total time of immersion in the hydrochloric acid bath should not be more than one minute, during which it may be taken out from time to time to see if the right stage has been reached. After preparation the plate will keep well in darkness. Becquerel's solar spectrum was formed by means of a lens of fifty centimetres focus, and was four or five centimetres long. The colours obtained upon the plates were sombre, the blues and violets coming out best. He found that he could improve the results by heating the prepared plate over an alcohol flame in a dimly lighted room before exposure to the spectrum, at a temperature of about 100° C. The operation must be stopped when the plate acquires a roseate hue. It will now give a positive instead of a negative impression, and the colours of the spectrum appear now more brilliantly. When a large spectrum is used, the time of exposure may be one or two hours, and Becquerel found that he could improve the results by pre-exposing the film to light behind a trough filled with sulphate of quinine placed in the path of the rays. He still failed, however, to fix his coloured photographs. Under coloured glasses they took the colours of the glasses, and in the usual photographic fixing solutions the colours disappeared.

Niépce de St. Victor brought, in 1851, his experiments upon heliochromy under the notice of the Paris Academy of Sciences. In his memoir he states that there is a relation between the colour produced by a salt of chlorine in a flame, and the colour produced upon a silver plate on which the chlorine has been thrown down from a solution of the same salt. Thus, a plate prepared in a solution of chlorine and chloride of strontium will show the reds better than any other colour. For orange, he used uranium or calcium as a base; for yellow, sodium; for green, nickel; and so on. Chloride of antimony or zinc, he says, gives a white flame, and if one of these salts be mixed with chlorides which give colours, “we obtain, in addition, a white ground, a thing very difficult to obtain, because, properly speaking, there exists no black or white in the phenomena of colouration.” The zinc salt has to be used in minute proportion, or it hinders the production of the other colours. He states that chloride of copper in an alcohol flame exhibits not only the green, but all the other colours of the spectrum in succession, according to the intensity of the flame. Hence this salt is useful in reproducing all colours. He prepared some of his plates with equal parts of chloride of copper and perchloride of iron, dissolved in three-fourths their weight of water. Sometimes he prepared plates from a solution of a large number of chlorides, but found it difficult to mix them in the right proportions, so that they should give photographs with natural colours in their true relation to each other. He mentions the names of a great number of chlorides with which he experimented, but gives little or nothing in the shape of exact formulæ, and he found that it was much more easy to photograph brilliant than subdued colours. After dressing a doll in fabrics of selected colours, trimmed with gold and silver galleon, he photographed it and obtained the colours successfully, the gold, instead of being dead yellow, coming out in the picture with its natural metallic lustre. Niépce found that when a plate was used directly after being taken out of the bath and dried an invisible copy of a coloured picture could be made, and the colours afterwards brought into view by gently rubbing the film with cotton wool dipped in ammonia; this dissolved the outside film, and revealed the colours upon the silver plate below. In one of his papers to the Academy of Sciences he says plainly that he is reserving information as to his exact method of working. He says that he found the presence of dextrine to be useful in obtaining natural colours upon chloride of silver. The facts of the case appear to be that Niépce took up Becquerel's discoveries, and by dint of practice turned out better photographs in colour by them than

had previously been seen. As to the quality of the results obtained by these heliographic processes, Niépce has according to general testimony been most successful. Some of his earliest photographs in colour were sent to the *Athenaeum* newspaper, which spoke very highly of them.

Niépce's results were fairly durable. About ten years ago the writer saw one of Niépce's photographs of the spectrum, belonging to Mr. Warren de la Rue, purchased by him at the first Exhibition in Hyde Park in 1851. He kept it in a leather case, which he occasionally opened for a few moments to show the photograph to those interested. Every one would at once recognise it as a good coloured image of the spectrum, but slightly sombre in appearance. About a year ago, in a letter written from Homburg, Mr. de la Rue informed the writer that the photograph was still in as good condition as when first purchased by him. Ammonia, applied at a carefully regulated strength, seems to be the most successful of the partial fixing agents of heliographic pictures.

Work more original in its nature was subsequently done by Poitevin, and communicated by him to the Academy of Sciences, as published in the *Comptes Rendus* for 1865. He sets forth that he had found oxidising agents to improve the action of the violet subchloride of silver, and that if paper coated with it were then treated with bichromate of potash, it displayed more colour sensitiveness. Poitevin took paper coated with pure chloride of silver, and turned it into the violet chloride by exposing it to feeble light while covered with a reducing agent, which Becquerel in another place says was usually protochloride of tin. Poitevin then applied to its surface a mixture of one part of a saturated solution of bichromate of potash, one part of a saturated solution of sulphate of copper, and one part of a five per cent. solution of chloride of potassium. The paper when dry will keep for several days. The function of the chloride of potassium is to keep the whites clean. This paper would to some extent give natural colours, when paintings upon glass were placed upon it, and the exposure to light then made. It was, however, not sensitive enough for the camera. To fix these images, the prints were washed in water acidulated with chromic acid, followed by water containing bichloride of mercury, then by a solution of nitrate of lead, and lastly by pure water. They would then resist the action of ordinary light fairly well, but would turn brown in direct sunlight.

The next and final stage of importance in research in relation to heliography was made by M. de Saint-Florent, and is published in the *Bulletin de la Société Française de Photographie* for 1873. A sheet of paper of very fine grain is steeped in nitrate of silver twenty parts, distilled water twenty parts, to which is added, after solution, alcohol one hundred parts, and nitric acid ten parts. The paper when dry is soaked in hydrochloric acid fifty parts, alcohol fifty parts, and nitrate of uranium one part. A few grammes of zinc white are dissolved in hydrochloric acid before the mixture is made. The paper is exposed while still wet to solar light until it assumes a violet-blue colour. It is then dried and plunged afresh into the nitrate bath, then in the hydrochloric acid bath, and dried as before between the two immersions. The foregoing operations are repeated until a very intense violet-blue is obtained, that being the only way of afterwards obtaining vigorous proofs. The paper is nearly dried, then put into a bath of water one hundred parts, acid nitrate of mercury four or five drops, and allowed to remain therein for five or ten minutes, then dried with blotting-paper. It is next exposed under coloured glass—say a magic-lantern picture—to the light of the sun, and in thirty or forty seconds a proof is obtained of all the colours of the design. The colours are more vivid, and the rapidity quite as great, if the following be added to the preceding mercury bath: Saturated solution of bichromate of potash or ammonia two parts, sulphuric acid two parts, chlorate of potash one part. It will be noticed that Saint-Florent treated his violet chloride of silver with strong oxidising agents. To fix the pictures to some extent they are washed in a large quantity of water, then plunged into ammonia five parts, and alcohol one hundred parts; they are again washed in water, and then placed in a saturated bath of alkaline chloride. After a final washing they will resist for a long time the action of diffused light. Greater rapidity is obtained if the darkening of the chloride of silver be effected under violet or blue glass. To produce camera pictures by this process, exposures of from fifteen minutes to one hour are necessary with a Dariolet lens of 0.20 m. focal length, and with its largest diaphragm, the object being illuminated by direct sunlight.

Saint-Florent's theory of his process is that when paper covered with subchloride of silver, with excess of hydrochloric acid, is plunged into a bath of nitrate of mercury, it becomes impregnated with Hg Cl, which, under the action of solar light, is reduced to Hg₂ Cl, or calomel. The freed chlorine transforms the violet chloride into white chloride, and afterwards the proof consists of coloured subchloride of divers tints, white chloride, calomel, and Hg Cl in excess. The last is washed out by water or alcohol. The calomel may be removed, he says, by transforming it into the higher chloride, either by means of aqua regia or chlorine water; then the white chloride of silver is gently removed by weak ammonia and alkaline chlorides, without attacking the colours. The usual photographic fixing agents do not answer.

Since Saint-Florent's experiments research in this subject has made little advance. On the coloured chlorides of silver recently made in bulk by Mr. Carey Lea, only the blue and violet colours have been obtained by him under the action of the spectrum; he succeeded a little better when he used coloured glasses. Captain Abney, in his article on *Photography* in the *Encyclopedia Britannica*, states that he has done something

on the subject, as recorded in the *Proc. Royal Society* for 1880, but the reference is an erroneous one.

In conclusion, the considerable advance made in the production of photographs in natural colours seems to have been effected mostly by empirical methods. One of the most interesting points in the results achieved is the photographing of metals and certain gems so that they give their own lustre instead of dead colours in the pictures. The hues of mother-of-pearl have also been photographed. Had a method of fixing the photographs been found out a great impetus would have been given to research, and it is evident that if the final deposit upon the plate is some combination containing silver and chlorine the picture cannot be permanent when subjected for a long period to light. The chlorine in the future must be removed, either with or without the substitution of another substance, and the film must still be left in such a condition that it will act in the same manner upon the rays of incident light, so as to still yield the colours of thin plates. Although for convenience the term "subchloride of silver" is always used in considering this subject, it should not be forgotten that it is a disputed point among chemists whether subchloride of silver has ever been isolated or not, although claims to have produced it have been frequently advanced, even down to the last few weeks.

W. H. HARRISON.

—Industries.

HOW ANGERER PHOTOGRAPHED AN INTERIOR.

L'Amateur Photographe contains the following narrative, which it quotes from "*Ind. photog.*," whatever that may mean:—

All who have to photograph interiors know the difficulty there is in obtaining good results when the lens exactly faces a window; they also know how they disquiet themselves about probable results in the shape of halation, and how good prints may possibly be unobtainable in spite of the most skilful retouching. Up to this time the plan of gumming red tissue-paper over the window has been adopted, but the results have been second-rate. In revenge, here is a process by which such interiors facing the sky can be photographed without solarisation, and at the same time the perspective view outside the window can be reproduced perfectly. It is the plan recently adopted by M. Victor Angerer.

This celebrated Viennese operator had to photograph a *salon* in Rothschild's palace. Independently of the difficulty imported by contrasts between the colours of the hangings, the furniture, and so on, another condition complicated the operation. The lens faced two windows in a circular wall, both admitting daylight. One of the windows was directly in front of the lens, and through it could be seen the church of Saint Charles.

M. Angerer solved the problem of producing his negative without solarisation, and beheld how:—

He focussed perfectly in full light, then he pasted black paper over the troublesome window, and he closed the second or lateral one by means of a double curtain, which permitted but little light to enter. The other windows in the *salon* gave the necessary light, but M. Angerer pasted white tissue-paper over them to diffuse it. He then exposed in the camera a dry plate for "a day and a half," after having placed a minute stop in the lens. At the end of this time he supposed the plate to be over exposed, and he capped the lens. He then opened the curtains of the lateral window in the circular wall, after which he gave another exposure, but of fifteen seconds only, the same plate being still in the camera. He again capped the lens, and removed the paper from the front window, then he exposed the same plate once more, but for four seconds only. The effect was surprising. There was no trace of solarisation, all was perfectly harmonious, and a special charm was given to the photograph by a sharply reproduced view of the church of Saint Charles outside the embarrassing window.

PERMANENT INTENSIFICATION WITH MERCURY.

The first point that suggests itself in connexion with the subject of the intensification of negatives, is the question whether they should ever require intensifying at all. Some practitioners say that they should not, and that in their own experience they never find any necessity for intensifying a negative subsequent to the development. It has also been said that a negative which has been intensified is never so good as one which has been developed to the proper intensity in the first instance.

Taking the last proposition first, I can see no reason why intensified negatives should be of necessity inferior, nor as a matter of fact have I found them to be so. Certainly if the negative is originally veiled in the shadows, and so requires intensifying in order that it may be made to yield prints showing some brightness, that negative will never be equal to one that was originally clear. Intensification, however, must not be blamed for faults which it did not create, because it is employed as far as possible to remedy them. On the other hand, reasons may be given why under certain circumstances a better result may be obtained by leaving the negative somewhat thin in development, and afterwards intensifying it, than would be possible by getting up printing intensity during the development itself.

When gelatine emulsion plates first displaced collodion for general

studio work in England it was remarked by a gentleman whose opportunities for forming a judgment were certainly exceptional, that the change of practice was accompanied by a marked deterioration in the quality of the negatives generally produced by photographers. One of the principal defects at that time, and I think it is still the weak point in a large number of cases, was a certain flatness in the lights due to a want of discrimination or separation in the sensitive film of different degrees of light; a want, that is to say, of power to register various degrees in the more strongly lighted portions of the plate. The forehead and light side of the face, for instance, may come with sufficient force to print as light as they should do; but the higher points of light on the nose, forehead, &c., will not show a proportionate increase of density such as will cause them to show their true value as we see them, or as they may be seen with other conditions of the chemicals.

This state of things exists in some degree to a very large extent. It is not noticed so much as it should be, because the retoucher's pencil is constantly called in to add these sparkling lights which give so much truthfulness, beauty, and value, to a photograph. It must be admitted, however, that it would be far better to have this registration of high lights rendered by photography itself, and, indeed, when it is left to the retoucher, the truthfulness of the rendering becomes open to considerable question, and must depend upon the individual ability of the retoucher himself.

When the want of sparkling intensity in the highest lights is due to an insufficient amount of silver in the film, as from too thin a coating, or if it proceed from any incapacity of the particular film to take sufficient intensity to build up these highest lights, it is obvious that an attempt to gain sufficient general intensity while developing, that is to say, with the material actually existing in the film itself, will result in bringing up the lighter half tones to about the same intensity as the highest lights, and thus produce the flat effect which has been spoken of. If, however, in such a case we are contented with a comparatively thin image in development we may, with management, succeed in producing an image which, although insufficiently vigorous, yet possesses a range of tone in which the highest lights may be seen distinctly marked out from the lighter half tones. Such a negative subsequently intensified will give a much finer print than one which, under the conditions given, owes all its intensity to the development.

In addition to the cases where a better forced negative may be obtained by keeping the image somewhat thin in development, and intensifying it afterwards, than by forced development alone, there are those frequently occurring where, from over exposure or other causes, a sufficient amount of intensity cannot be obtained in the development itself. Moreover, when there is no difficulty in obtaining intensity there is an uncertainty to most people. I confess there is to me in the light of the dark room and whilst the plate is charged with an undefined amount of silver bromide, varying with the thickness of the coating, in deciding upon the exact amount of intensity at the development stage. A good method of intensifying is, therefore, a very desirable and very useful adjunct to our other photographic operations.

Without going over the details of other methods of intensifying, I will describe the one which I have employed now for some years and which I use, I may say, every day. It certainly succeeds better in my hands than any other that I have tried, and friends to whom I recommended it speak of it in equally high terms.

One of the intensifying processes of the collodion days consisted in the use of a solution of bichloride of mercury, followed after thorough washing by one of Schlippe's salt, sulphantimoniate of soda. This process will, with certain precautions, succeed with gelatine negatives, but the colour obtained is very red, and it is consequently difficult to judge of the intensity, and inconvenient to the retoucher. I much prefer, and regularly use, a solution of iodide of mercury followed by Schlippe's salt. To prepare the iodide of mercury, take a certain quantity of saturated solution of bichloride of mercury. It is convenient to keep always a bottle of this saturated solution, and as it is used from to put in more water, and when need be, more crystals of the bichloride. Pour off enough of the saturated solution to one quart; fill a pint bottle—a wide-mouthed empty pyro bottle answers capitally. Now put in a few crystals of iodide of potassium, and keep the solution swilling round the bottle. The crystals very quickly dissolve and more may be added whilst keeping the solution in a continual swilling motion until the red precipitate first formed is redissolved. If it be thought that a considerable excess of iodide has been added, more bichloride solution may be poured in, until a little red precipitate is again just formed. This may or may not be redissolved by another crystal or two of iodide. I have not found that a slight excess of either of the ingredients interferes with the action of the solution. We have now a strong solution of iodide of mercury, which, for very weak negatives, may be used as it is, but it is generally better to dilute it two or three times with water before use.

The negative to be intensified must, of course, be thoroughly fixed, and have the hypo washed out of it in the usual way before the mercurial solution is applied. This may be done either in a dish, certainly the best method for large sizes, or poured upon the negative held in the hand. The latter plan affords opportunity for specially strengthening particular portions of the negative, as, for example, one face in a group. To do this the solution may be poured from a lipped measure on to the spot where intensity is most wanted, and allowed slowly to spread over the

rest of the plate, which may then be rapidly washed and the process repeated if need be.

If the mercurial solution be used in a dish, the latter must be kept in motion, otherwise peculiar wavy or arborescent markings may be formed. If these marks have started, they may be got rid of by allowing the negative to gain full intensity all over, and if then too dense, it may be reduced after washing by a short stay in the hypo bath before treatment with the Schlippe's salt.

A point to which attention must be given is the thorough removal of the mercury solution by washing, before applying the Schlippe. If this is not done, a yellow stain will be formed which will slow the printing considerably and probably show stains from inequality. I have found, however, that half an hour in an upright washing trough, after a good rinse under the tap, is sufficient, although, of course, with a very thick film of gelatine more time might be required. After washing, examine the negative in a good light to decide whether the intensity is right, bearing in mind that the next process, whilst fixing the intensity, will also somewhat add to it. If deemed too dense, it may, as before mentioned, be reduced in the hypo bath before Schlippe, but not afterwards. The hypo bath for this purpose should not be one that has been much used for fixing and become highly charged with silver. When an old bath of this character has been employed, I have even known the intensity of a negative to be increased, instead of diminished by it, and this intensity at the same time fixed, as if by the Schlippe's salt. I have thought of working out a formula by which such a bath might be used in the place of the Schlippe with which it is my habit to finish.

With a new and moderately strong hypo bath, the intensity given by iodide of mercury may be removed to any extent desired. If this operation has been performed, the plate must be washed again in the usual way before the final operation, which consists simply in pouring on a solution of Schlippe's salt—strength immaterial, say, five or ten grains to the ounce of water—until the characteristic change of colour is seen at the back of the plate. A final washing concludes the process.

If it is judged even now that the negative is not intense enough, the whole process may be repeated, but I prefer in this case to use a bichloride of mercury bath instead of an iodide of mercury one for the repetition of the process. If bichloride of mercury solution be used, however, it must, as pointed out by Mr. Arnold Spiller, be rendered slightly acid with a drop or two of hydrochloric acid, otherwise a combination is formed between the gelatine and the mercury. After washing, the Schlippe is to be repeated and the plate finished by washing, as before.

It is a point of great importance with this, as with all other intensifying processes, that the plate should be thoroughly fixed. It is a well-recognised fact that there is a silver compound in a gelatine plate, which takes longer to dissolve in the hypo than the visible bromide of silver does, and it is, therefore, a rule with many, and a good rule too, to leave a plate in the hypo for about twice as long a time as it takes to make it appear fixed to the eye. If any of this undissolved silver compound be left in the film, it may generally be recognised after the application of the mercury as a sort of bloom which shows from the back of the plate, and which looks as if it were between the plate and the film. If a plate in this condition is treated with Schlippe's salt, this bloom will develop into a deep orange stain. When it is present, therefore, the negative should be placed in strong, fresh hypo until the bloom disappears, when it may be washed and treated *de novo* with mercury-iodide solution, for the intensity given by the first application will all have disappeared in the hypo, and the plate will be indeed somewhat weaker than at the start.

Of course, there should never be a yellow stain due to imperfect washing between the application of the mercury and of the Schlippe's salt solutions, but if it should occur, it may be much modified by the application (after thorough washing, of course) of the acidified solution of bichloride of mercury which has been before referred to. In this case, however, Schlippe's salt should not be used again, but the plate should be merely washed and dried.

The use of Schlippe's salt I have found advantageous, not only for rendering mercurial intensification permanent, but also for restoring printing vigour to plates that have been treated with mercury and afterwards faded. In this case I thoroughly remove the varnish with alcohol, and after soaking in water, flood with a solution of the salt, and then wash again.

W. E. DEBENHAM.

—Photographic Times.

ON THE TREATMENT OF VERY SENSITIVE PLATES.

[American Convention.]

Dry plates were originally made to take the place of wet plates, with hardly a thought of making them more rapid than collodion, and the keeping quality was at that time the main desideratum. That the dry plate contained within itself the possibilities of great speed was evolved at a later day, and as the working of dry plates became more familiar to the craft, a demand for more speed or sensitiveness was made, and as promptly met by emulsion makers, and plates are made of sufficient sensitiveness to reproduce objects moving at a high rate of speed, and really wonderful achievements in this direction are to be seen every day. That plates of a high degree of sensitiveness require very careful treatment is at once apparent when we consider how readily they respond to the

faintest touch of light, be it light entering through the lens or through a pinhole in the bellows of the camera (which may be invisible from the outside), the minutest ray of light entering through door of slide, or between tablet and back of camera—prolific sources of trouble. All of these will be promptly registered upon the plate, causing fog, for which the plate will often be blamed and condemned as foggy and worthless.

Although very sensitive plates are as easy to manipulate as plates of lower sensitiveness, they require more care and attention to have the proper safeguards thrown around them—safeguards which really should be used for all dry plates. It is not fair to subject plates of different degrees of sensitiveness to the same conditions and treatment to determine upon their merits. For reasons already stated, a slower plate may remain perfectly clear when a more sensitive plate will show signs of fog in the same proportion as when an old style wet plate would be compared with a modern dry plate. It is a pity that so often the finest plates are spoiled by improper treatment.

If photographers would be all as careful in their manipulations as the maker of the plate has to be, there would be little complaint, and it would not happen that one will say, "No. So-and-so is no good." Another will write, mentioning same number, "Send me every plate you have of it." Another one writes, "I want a very rapid plate, but one that is not so sensitive." This is an absurdity; rapidity and sensitiveness are one and the same, and cannot be separated.

To work very sensitive plates successfully, everything should be in the best working order. The dark room, aside from being roomy, well ventilated, and having all the necessary conveniences, should be perfectly tight, and the colour of it, inside, non-actinic. Coloured paper used for the lantern or window will fade, and should be removed from time to time. Examine dark room, camera, tablets, and lens at intervals; see that your dishes are always clean and everything convenient. Have your chemicals fresh and pure and well stoppered. Bear in mind the difference between chemicals of the same kind but in different form. For instance, sulphite of soda granular is about twice as strong as sulphite of soda crystals. Carbonate of potassium is about equal in strength to dried carbonate of soda; both are about twice as strong as the carbonate of soda crystals or sal soda, as it is commonly called.

Guard against any trace of diffused light, too much exposure to the coloured light while developing, or having the coloured light too strong. Use fresh developer for short exposures and old developer for over-timed plates, remembering that old developer will produce more contrast and clearness on addition of a little old developer or a little bromide developer in proportions to suit the exposure. If very much over timed, restrain by adding solution of bromide of potassium, and if under timed dilute the developer, and do not try to force the development by adding an extra dose of alkaline solution, as this will only injure the plate.

Observe that a developer strong in pyro produces strong negatives, and that the temperature of the developer and the quantity of alkali it contains is of great importance. If the developer is warm or contains too much alkaline, it will fog a very sensitive plate. Keep the developer cool in summer (about 70° Fahr.); in summer the strength of alkali should be reduced to one-half the strength used in winter.

If uncertain about correctness of exposure, start with developer diluted with plenty of water, so that you may see what the plate wants before it is too late. If you commence with a strong developer the image will flash up at once, and the negative may be spoiled before anything can be done to save it. If you commence with diluted developer you have a chance to change or modify the developer as the plate requires it.

There are many points in developing to which a careful operator will give due attention, and the results will demonstrate that it is worth all the labour and study to thoroughly master the science of development.

G. CRAMER.

KILLED BY OVERDOSE.

[American Convention.]

THE uses and abuses of developing methods in general practice is my subject. I give my impression and my opinion more as an observer than as a handler. I do not expect to tell you anything new, but may attract your attention to my impressions in a manner to get some value, if any be in them. The formation of the image in the negative plate and the positive paper are operations of such importance that we can hardly learn too much about them.

First let us consider the negative. You all know that pyro is the developing agent (I say pyro, because it is almost universal in this country), and that the accelerator, whether it be ammonia, soda, or potash, is the power that sets the pyro at work. You understand that the pyro produces the intensity in lights or the white parts of your image, and that the accelerator takes care of the dark parts by working up the lower shadows and giving detail and modelling through the lesser ones.

You all have your formulae, which you believe in. It is not my purpose to disapprove of any one, but to caution you to a careful use of all.

The exposed plate has an image in it; possibly the image is a landscape, some parts of which lie in full light, while another part falls in deep shadow, or a clump of heavy, dark foliage occupies the foreground—perhaps it is a room interior, which was dimly lighted, or the portrait of a

person taken much in shadow. We are about to call that image into a palpable existence—to make a visible fact of it. In case of either of the above described exposures shall we take the usual formula of proportion—so much No. 1, so much No. 2, to so much water—as printed directions to be found in every package of plates says is proper?

Dare we do it? I say no, if we care to find the best results. Now is just the time to go slow, the image can be better coaxed than driven. Take time, be patient, and get your reward. Understand you cannot get your density first and your details afterwards, but can first get your details and afterwards your density. It is always best to first lay the foundation and then erect the structure. Any builder will tell you that.

One of the most valuable elements of a developer is water, and it is too little used, or, in other words, too little of it is used.

Particularly for all plates of suspected under exposure or of doubtful time, as well as for all large heads, a weak developer is required to start, and if found to want more strength it is easily changed by addition of pyro.

Looking to pyro for density and the accelerator for details, it is easy to understand by varying the proportions of these two elements most any desired effect can be secured. The strong developer gives dense, harsh results, while a weak developer gives soft and delicate effects, hence the value of more water. Remember the mild power is most effective for perfect results in developing. Don't give heroic treatment at the start in any case.

It often happens at the close of a day's work, with a big crop of negatives to develop, that the operator, anxious for supper, pushes the work too rapidly for safety. The next morning they are found coarse, harsh, and smudgy. They were killed from overdose. If the proprietor have a care of the good name of his work the sitters must be recalled and retaken. Too much haste often spoils what a little patience would have saved. What I believe to be the best and safest method is to commence with the developer weak and with the accelerator in excess of the pyro. As the development progresses, and a want of more strength or density is discovered, pyro should be added to it. To wear the same weight of clothing throughout the year, in cold and hot weather alike in a climate like ours, would be reckless and inhuman, but no more absurd than to give all plates the same strength of developer. No man can give a formula for all plates and all conditions, but by care and observation all men who develop plates may learn to adapt proportion and strength of solution to the plate requirement.

Now a word about making the image in the albumen paper. All printers know that silver makes the print—too many of them think the more silver used the better the print. As a rule, when anything is found to be wrong more silver is doused as a remedy. Where forty grains of silver to the ounce of water is recommended by the albumeniser of the paper, who knows the proportion of salt used and bases the requirements of silver upon that knowledge, the usual printer requires sixty grains. Just enough chemicals for plate or paper is better than too much. The tendency to overdose is prevalent, and the results are similar upon plate and paper alike. In both cases the overdose gives harsh effects, forms a crust upon the surface, preventing the gradual and perfect conversion through the film—clogs the shadows and flattens the lights. It is not unusual to see prints with the shadows and dark parts hardly loaded with a bronzed Mars, and sometimes even a green fog from overdose. Gold is always subject to the same abuse, being sometimes used so strong as to destroy rather than produce good tones.

A little more knowledge among operators and printers of paper, and necessary conditions for successful work in their departments of photography, and a careful observance of the requirements, would greatly lessen the mortality list in plates and paper.

J. F. RYDER.

OBSERVATIONS AND COMPARISONS.

[American Convention.]

WHILE it is not my motive to give a lengthy paper on this subject, I shall only refer to Germany, France, and England, as compared to home photography, trusting that it will be of value to you, especially to our younger members who are deeply interested in their profession. It has been often said that European cities, with their well-stocked art galleries and museums, which contain the choicest art treasures that have been concentrated during centuries, create large influence in the art training of the student photographer. This advantage you have often referred to in former Conventions of the Photographers' Association of America, that our foreign photographers enjoy. During my tour in Europe I visited their celebrated art galleries by the score. I walked along walls covered with canvas for miles, representing all the old masters, paintings large and small, the majority representing sorrow and subjugation. How shall we employ these studies in photography in this advanced nineteenth century, when it is our endeavour to represent in our work life and joy?

But does the photographer take advantage of such object-lessons his Government has so beautifully placed at their disposal? Upon inquiry I was told, and my observations agree, that the art galleries and museums are the abode of tourists. Then what advantage have they in the race for progress over us? Compare their miles of canvas and marble to the miles of photographs you have been enabled to study through this Association, and the thousands of object-lessons here placed before you.

For a number of years several German photographers favoured our Association with their best work, which received our universal admiration, but how about the average of work in Germany compared to America? Large cities like Berlin, Dresden, and Frankfort contain several very fine studios, where good work is done; the same is true of New York, Boston, and this city—Chicago. If we compare their elegance and conveniences, sizes of cameras, &c., and the amount of large work done, they must take a hack seat.

The studios in Berlin, while several are in Unter den Linden and main business centres, they are situated in the rear of the main line of buildings, the entrance is through a passage into an open court, where the studio is generally on top of a three- or four-storey building, accessible by narrow stairs, while others more favourable have built their studios in a garden; but the latter are often in the outskirts of the city and hard to find. Skylights in Berlin are very large, and some have a length of forty to fifty feet. But while the studios are so unfavourably situated, the photographer displays his work along the public squares and other places accessible to them. Some have erected elegant pavilions for their display, and those contain booths for the sale of opera tickets and for making appointments for sittings. Such a novelty might be introduced here. The number of galleries in Berlin, Dresden, and Frankfort are not so numerous as in New York alone. Photographers of small means and poor workmen seldom locate in large cities, but remain in small towns, or tramp through the country. Prices obtained here for cabinets range from ten to thirty marks, and orders from quarter to half dozen are the rule, but the cabinet has not obtained public favour, for the *carte-de-visite* still holds the fort; prints above ten and thirteen are the exception, and the majority of photographers have not even the instruments to fill an order. There is another individual I must not overlook, for I know you are all anxious to hear from him. The Cheap John, he has his abode there, too; but, unlike our American Cheap Johns, he is not so numerous nor so well up in photographic branches yet, for he is a very poor copy of his American relations. I noticed a fellow who had his place on one of the principal streets in Berlin, and over his shop, a very small one indeed, he displayed the now famous large white rag of distress, "*Americanischer schnell photographie, a ein mark!*" Now you will be as astonished when I tell you that this American quack photographer was our old and long-forgotten ambrotype on glass, and backed with asphaltum. If he had used ferrotpe plates, it would have been proper to term them American.

JOSHUA SMITH.

(To be continued.)

THE ROYAL CORNWALL POLYTECHNIC SOCIETY'S EXHIBITION.

(By a Special Correspondent.)

The Fifty-fifth Annual Exhibition of the Royal Cornwall Polytechnic Society opened at Falmouth on Tuesday, September 6, at eleven o'clock a.m. The opening ceremony took place at one o'clock; Lord Robartes, the President, presided, and gave the opening address. On the platform were Lord Robartes, Mr. A. Pendarves and Lady Jane Vivian, Rev. Canon and Mrs. Phillpotts, Sir Warrington Smyth, Mr. Talbot Baker, Mr. Edward Vivian, the Hon. Mrs. Boscawen, Major Parkyn (Hon. Sec. Royal Institution of Cornwall), Colonel Bull, Colonel Pender, Revs. Canon Rogers, W. Rogers, H. M. Jeffrey, F.R.S., W. N. Caine, W. Brooks; Miss A. M. Fox (the founder of the Royal Cornwall Polytechnic), R. Carter (the Mayor of Falmouth) and Mrs. Carter, R. N. Worth, F.G.S., R. Fox, H. Fox, Mr. E. Kitto, F.M.S., Secretary, &c.

Lord Robartes, in his address as President, said that he thought this year's Exhibition would compare favourably with its predecessors of former years, and it gave him great pleasure in seeing so distinguished a company present. He then alluded to the various departments, viz., Mechanics, Naval Architecture, China Clay Works, Engineering, Natural History, Fine Arts, Gas, &c. He said that the new patent Welsbeck incandescent gas must not be overlooked, as it was one of the features of the Exhibition; it gave a very brilliant and steady light, without flame or smoke, and thought it had a great future before it. He said that the Photographic Department was considered the best that had ever been, which was under the direction of Mr. W. Brooks, who took great interest in the Society. Among the exhibits were some very fine specimens of the art. Mr. J. Byrne, of Richmond, was awarded the first silver medal for a very beautiful untouched portrait of the Hon. Frederick Tollemache, Mr. Lafayette receiving the second silver medal for the portrait of the Countess of Londonderry, which was very fine indeed. Mr. H. P. Robinson had a very beautiful composition picture—a pastoral subject, with great artistic merit; he again was awarded the first silver medal. Mr. W. H. Hyslop received the only award for his most perfect studies of yachts racing, in the amateur section, a second silver medal. Mr. B. Wyles, of Southport, had a marvellous specimen of instantaneous photography—a flight of sea gulls, which was very interesting; this also received an award. Mr. W. Brooks lent a frame of beautiful lantern transparencies of Windsor Castle State Apartments, &c. This department was the most perfect in the Exhibition. He had to acknowledge gratefully his obligations for valuable information in the various departments to Mr. Worth, Mr. Davidson, Mr. Brooks, and Mr. Kitto, the Secretary.

At the end of the address he proposed an address be presented to Her Majesty in this her Jubilee year. They might appear somewhat late in the day, but their meeting had only just taken place, and it was not practicable to arrange it before. The proposed address was then read.

The Society had had Her Majesty for its Patron ever since 1836.

Mr. Pendarves Vivian, in a very brilliant speech, seconded the proposed address, which was received with great applause and enthusiasm.

Several other speeches followed by Sir Warrington Smyth, F.R.S., Talbot Baker, Esq., and several others, and the usual vote of thanks was given to the President, Lord Robartes, and the Exhibition was declared open.

At night the photographic department was illuminated by the Welsbeck Incandescent Gas Company, which was a perfect success. This light, in all probability, could be used for photographic purposes, as by its colour it is probably very rich in actinic rays, and well worth a trial.

THE ART UNION OF CORNWALL.

The Annual Drawing of the Art Union Prizes took place on Friday evening, in the Polytechnic Hall. After the drawing the winners select prizes to value from the works of professional artists that are for sale in the Fine Art Department, and also from the works of professional photographers which are marked in the catalogue for sale.

The following are the winning numbers with prizes:—

1244 Mr. Job	£0 5	1380 P. D. Williams	£1 0
1215 Mrs. Babling	3 0	779 B. Freeman	3 0
625 Robt. Fox	2 0	894 Earl of Mt. Edgcombe	0 5
1394 G. R. Bossistow	2 0	1057 E. Carter	2 0
666 W. N. Carno	1 0	1329 E. Williams	1 0
411 Mrs. Genn	2 0	436 A. W. Tuer	10 0
404 H. W. Broad	1 0	1026 W. Knebone	2 0
1458 Rev. R. C. Sowell	5 0	1117 A. H. Best	3 0
596 Earl of Mt. Edgcombe	0 5	563 Lord St. Levan	0 5
1251 Miss M. P. Sharpe	1 0		

PHOTOGRAPHIC DEPARTMENT.

Judges Report.

The Judges in this department again have great pleasure in congratulating the Society on the great superiority of the Exhibition in this department over preceding years. In portraits the exhibits are above the average in number and also in quality, many of the specimens are of large dimensions, and far surpass anything that has hitherto been exhibited; there are some life-size examples taken direct. In landscapes by professional photographers, the exhibits are, perhaps, not quite up to the number of previous years, but the examples are of the highest order.

In instantaneous photography there are some marvellous examples of birds on the wing, &c. In composition pictures there are some very clever and artistic productions. In the amateur section there are some perfect gems of photography and quite on a par with many of the professional productions, which speaks well for their energy. In specimens of interiors little or nothing is exhibited. In the photographic appliance department there is a falling off.

PROFESSIONAL SECTION.

No. 602, a study of trees, by J. Milman Brown (an old exhibitor), possesses artistic merit and is highly commended by the Judges. No. 590, *Landscape and River Scene at Derwentwater*, by Mr. T. A. Green, has been awarded the first silver medal as the best landscape in the Exhibition; it is printed in platinotype and is a most artistic production, and of a kind that is seldom seen—the atmospheric effect is extremely fine. The same gentleman has several other exhibits which are well worthy of notice. No. 609 is an instantaneous picture of a large number of sea gulls on the wing, and this has been awarded a second silver medal. The birds are in every conceivable position, and most of them perfectly sharp, showing that the exposure must have been very rapid, and such a picture must prove of great value to the painter. This picture is by Mr. B. Wyles, of Southport. The same exhibitor has several other meritorious productions.

Mr. George Jones contributes a very amusing picture of some dogs, also several cloud studies; the latter, in the opinion of the Judges, are printed a little too deeply to be effective. No. 617, *Carolling*, by Mr. H. P. Robinson, is a most artistic production, and must rank among that gentleman's works as one of the finest; it is full of poetry, and is printed in sepia, and too much cannot be said in its praise. As usual, he takes the highest award—the Society's first silver medal. Mr. E. T. Shelton sends a very good enlargement, *The Morning Tub*—a little child about to take its bath.

Mr. J. B. Scott sends several artistic productions. Mr. J. Weir has several fairly good pictures. Mr. W. J. Byrne, of Richmond, sends some very high-class work. A first silver medal has been awarded to a direct picture of large size of the Hon. Frederick Tollemache. It is a most splendid specimen of untouched photography, the finest in the Exhibition. The frame above it, by the same artist, contains some specimens of photography (portrait studies) taken in ordinary rooms, &c., being perfect gems in their way, and cannot fail to attract attention.

Mr. W. Crooke contributes some enlargements in platinotype, which are very effective.

Mr. A. G. Gibson, of Penzance, sends some of his well-known studies; the most striking is a picture of two Newlyn fishwomen. A second silver medal has been awarded to a picture of the Countess of Londonderry, by Mr. J. Lafayette, of Dublin. It is a perfect picture, and the retoucher's art has played a prominent part. There are several other magnificent works of the same order. Messrs. Werner & Son send some very fine portrait studies well worthy of notice. Mr. J. Geddes sends two pictures; *The Blacksmith*, a composition picture, is admirable. Messrs. West & Son again send some of their yacht pictures, which are wonderful productions, but the Judges do not think they quite come up to their former exhibits.

Mr. W. Winter, of Derby, again sends some of his well-known work. Mr. Luke Berry is represented by some clever studios. No. 666, *Preparing for Boxing Night*, composition picture by Mr. F. Whaley, is a picture of great merit, being an interior. The figures quite carry out the idea of what they are intended to represent, and the accessories are well in keeping. To this picture has been awarded a special first bronze medal. The same exhibitor has several other high-class productions. Mr. W. P. Marsh contributes several examples varied in character, and very artistically treated. Messrs. Johnson Bros., of Henley-on-Thames, have some good examples of instantaneous photography of Henley Regatta, which are perfect in their way; they have also two enlargements which are good. Mr. T. G. Whaithe sends some very high-class portrait studies well worthy of careful inspection. Mr. John Pike shows some good specimens of careful work. Mr. R. W. Robinson contributes a number of small pictures which are very artistic, but rather too small to tell well at an exhibition.

Mr. Warwick Brookes, of Manchester, receives a first bronze medal for his frame of direct portraits, life-size, No. 708, which are very effective. Mr. W. England, of London, sends some small instantaneous pictures taken on a tricycle, which are very perfect and natural. Messrs. Morgan & Kidd have been awarded the medal for enlargements, viz., first bronze.

AMATEUR SECTION.

The Reredos, All Saints', Stoke Newington, a picture by Dr. E. W. Alabone, has been awarded a first bronze medal. It is a very elaborate piece of work, and is well rendered, being full of exquisite detail. The same exhibitor has several river scenes. These are somewhat heavy through under exposure, and the sky parts being all white tends to make them hard; with more exposure and a suitable sky printed in they would make capital pictures, as the subjects are well chosen. F. M. Puddicombe, R.N., also sends some well selected scenes, but several of them are somewhat heavy; the defect seems mostly due to the printing. The same exhibitor has a well defined flash of lightning, which is very curious. The best pictures in this department are Mr. W. H. Hyslop's yachting studies. He has some of large size, and appear to be the best examples of yachts in the Exhibition, and he seems to be a little in advance of the professionals in this special branch; they are very soft and delicate and with good atmospheric effect. Mr. F. K. Hurman sends several good studies. Mr. A. J. Leeson also has a nice little picture. Mr. W. J. A. Grant this year is very varied in his selection, which is an advantage; his Irish cabin is a beautiful little picture. He has also several well chosen subjects with figures, but the best of his exhibits are two frames of portraits taken in a drawing-room, and are finer than many taken in a studio. A first bronze medal has been awarded to Frame 748. The figures are very artistically posed, and the rendering of the drapery is perfection. Mr. W. Clement Williams sends a selection of outdoor pictures, which show great taste and skill. The Rev. H. B. Hare takes the landscape prize this year, a first bronze medal for a capital picture, *Thirsty Moments*—a meadow and river with cattle. It is a charming little picture, and is very soft and at the same time brilliant, with sufficient force and vigour. Mr. George Davison has some clever little sketches, mostly figure subjects, some of which are very comical, but each one tells its own tale. To the picture *Coal Heavers* has been awarded a second bronze medal. The same gentleman has also several rural pictures which show great talent and artistic taste. Mr. H. D. Crocker, R.N., sends several clever river studies, which show careful manipulation. Mr. R. Hansford Worth contributes several outdoor groups, which show good manipulation; the groups are well arranged and have a very natural effect. *The Deverstone* is a pleasing little picture, but if a suitable sky had been printed it would have greatly improved it.

PHOTOGRAPHIC APPLIANCES.

No. 800, a photographic print washer of an improved form. The Judges have given it a good practical test, and with a moderate pressure of water it works well and is very effective. The prints are kept in gentle motion and can be drained at the finish. A second bronze medal has been awarded to it.

A MEMORANDUM ON THE POWER OF DISCRIMINATING MINUTE SPACES.

NOTING the effect of different sized apertures in the production of an image on the focussing screen of the camera, it occurred to me how small an aperture, in a good light, would it be possible to see with unaided vision. Much of course depends on the eyesight and how

the space is illuminated. The smallest visible aperture I can call to mind is a pinhole in a negative which is made visible chiefly by irradiation, but it would be impossible to estimate its size without an instrument.

The following plan of estimating the diameter of a small space, although perhaps of no practical use, is curious as showing the exceedingly minute spaces that can be appreciated by ordinary and unaided eyesight. If a pinhole $\frac{1}{16}$ of an inch in diameter be made in a piece of metal foil (this is easily done by setting off $\frac{1}{4}$ inch on a similar piece of foil and pricking in it twenty holes close together and so large that the twenty in a line will fill up the space of $\frac{1}{4}$ inch). Holding this up to the light (the eye being protected from any other than that passing through the aperture) and steadily looking at it with one eye at such a distance that the edge of the hole is a little out of focus, there will appear a network filling up the space consisting of rings (I counted nine distinctly and several not so distinct), which do not overlap in any part but quite fill up the aperture, and consist of an opaque circle enclosing a space, the line forming the circle being about a sixth of the diameter of the space. Knowing that the pinhole is $\frac{1}{16}$ of an inch in diameter, and that four of these rings are required to fill a line across it, they would be each $\frac{1}{64}$ of an inch in length, the lines forming the rings being but a sixth of their diameter. The thickness of these would be $\frac{1}{1000}$ inch. The triangular spaces formed between the outside of the rings were apparently about half the diameter of the lines, but indistinct. Therefore in a rough estimate we might say that a space of $\frac{1}{1000}$ of an inch is appreciable by the unassisted vision.

EDWARD DUNMORE.

Our Editorial Table.

LEISK'S SKY SHUTTER.

THIS shutter, which is manufactured and sold by Marion & Co., Soho-square, is one of the rotating class. The aperture in the rotating and exposing disc is so devised as to give an exposure to the foreground of about three times the duration of that given to the sky, by which are secured those cloud effects which impart such a charm to a landscape. Its formation will be seen from the adjoining illustration.



The shutter is made of ebonite—very light, and can be adjusted to any length of exposure, from about one-fiftieth part of a second to any length desired. It is fitted with Cadett's Patent Pneumatic Release, and this, together with the construction of the shutter, which reduces friction to the minimum, prevents vibration during exposure.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 12,168.—“A New or Improved Process for Obtaining Positive Black Ink Copies from Positive Tracings or Negatives by the Action of Light.” G. BAY.—Dated September 3, 1887.

No. 12,191.—“Improvements in Shutters for Photographic Cameras and in the Mechanism for Actuating such Shutters.” A. S. NEWMAN.—Dated September 8, 1887.

No. 12,275.—“A Folding Developing Tray with Plate Lifting Frames in which all Handling of Photographic Plates is entirely avoided.” W. TYLAR.—Dated September 10, 1887.

No. 12,285.—“An Improvement in Tripod Heads for Photographic Cameras.” F. MIALL.—Dated September 10, 1887.

No. 12,292.—“Improvements in Washing Photographic Prints and in Apparatus therefor.” A. MARRIOTT.—Dated September 10, 1887.

PATENT LAPSED.

No. 2677.—"Photographers' Backgrounds, &c." Communicated by Lindop. A. M. CLARK.—Dated 1883.

PATENTS COMPLETED.

IMPROVEMENTS IN WASHING AND DRAINING RACKS FOR PHOTOGRAPHIC NEGATIVES.

No. 4202. GEORGE FREDERICK BLACKMORE, 1, Coulter-road, The Grove, Hammersmith, W.—March 21, 1887.

IN arranging the sides and ends of racks with hinged connexions in such a way that they form a parallel or nearly parallel motion when being folded, collapsed, or closed up, and in making either or both of the sides partly or wholly detachable at will, for greater convenience in folding or closing them up.

To carry out my invention I arrange the parts in such a manner that the rack can be quickly prepared for the reception of negatives or similar articles, and may also be rapidly closed or folded up into a very small space, thus making it extremely portable and convenient for packing or stowing away for travelling. The rack in its simplest form is made of two sides of corrugated or grooved zinc or other suitable material, the corrugations or grooves being of any number according to the quantity of plates or negatives that it is intended to hold. The two corrugated or grooved sides are maintained when in use at suitable distances apart, corresponding to the size of plate or negative that it is to be used for, by two or more bands of wire or strips arranged so as to pass at right angles to the corrugated or grooved sides in a continuous length along the backs of them and to connect them at the ends.

To the outside of the corrugated or grooved sides the wire bands are attached at suitable distances apart, and parallel to each other in such a way that they form a hinge or parallel motion. By this arrangement the sides may be moved so as to lie end to end and perfectly flat. Along the inside of the corrugated or grooved sides, at a suitable distance from the bottom, is fastened a strip of wire or other material to form a stop or ledge on which the negatives or plates can rest, and which prevents them passing through the rack when being used. To the upper of the parallel wires or strips there are attached two or more loops or handles that are free to turn on the wires, so that when necessary the rack can be suspended by them, and when not in use they can be folded down close to the corrugated or grooved sides.

In some cases I arrange a number of the corrugated or grooved sides in a row and connect them all by a series of wire bands or parallel motions, so that they will all fold together when required.

I sometimes arrange two or more pairs of parallel strips or wires to connect the corrugated or grooved sides, without passing along their backs, by means of loose pins or rivets at each end of each strip, so as to afford a hinge or parallel movement similar to that already described.

In other cases I so arrange the parallel wires or strips that either or both of the corrugated or grooved sides can be partly or wholly detached from them, and thus allow the rack to be folded into a still smaller compass. This I accomplish by means of hinged or spring clips or their equivalent fastened to the corrugated or grooved sides by means of pins or rivets, or by soldering or equivalent method, so that they can clip the wire bands or be detached when required, and allow the corrugated or grooved sides to turn or hinge freely, as previously described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
September 19 ...	Notts	Institute, 9, Shakespeare-street.
" 20 ...	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
" 20 ...	North London	Myddelton Hall, Upper-st., Islington
" 20 ...	Bolton Club	The Studio, Chancery-lane, Bolton.
" 21 ...	Bristol and W. of Eng. Amateur	Queen's Hotel, Clifton.
" 21 ...	Bury	
" 21 ...	Hyde	Mechanics' Hall, Hyde.
" 21 ...	Manchester Club	
" 21 ...	Edinburgh Photo. Club	5, St. Andrew-square.
" 21 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 22 ...	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, September 8, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. W. II. Prestwich presided.

The Hon. Secretary exhibited a print of a flash of lightning taken by Messrs. Robinson & Sons, of Regent-street, London. Like the one previously exhibited by Mr. Gray, in one part of its course the flash apparently turned back upon itself in a loop. A print of a Convention group by Mr. Crooke, of Edinburgh, was also exhibited.

Mr. A. COWAN, in support of a contention of his that bromide of potassium is not a restrainer in the developer when an alkali is present, said that he had developed several similarly exposed negatives with solutions containing different proportions of the bromide, the maximum used being sixteen grains to the ounce. The plate in the latter was the longest in developing, but gave more detail and a more brilliant picture than did any of the others; he concluded that the bromide retarded but did not restrain development. Mr. Warnerke, he stated, once exhibited a splendid picture from a plate which had had eight times the proper exposure upon an edifice in Moscow; the plate had been soaked for half an hour in bromide of potassium before development.

Mr. B. WOLLASTON stated that citrate of soda was a powerful retarder.

Mr. W. M. ASHMAN said that Mr. Watmough Webster had first published the latter fact; and he used a one per cent. solution.

Mr. A. HADDON remarked that when pyrogallol was preserved with citric

acid the subsequent addition of ammonia necessarily caused the formation of the powerful restrainer, citrate of ammonia.

Mr. COWAN added that anyhow such use of citric acid acted very well practically.

A question in the box was, what would remove the yellowness of negatives reduced with ferridcyanide of potassium.

Mr. ASHMAN responded that a weak solution of hydrochloric acid removed it at once.

Mr. COWAN preferred very weak perchloride of iron as a reducer.

Another question in the box was, what was the best material for lens mounts to reduce their weight for tourists, and should photographic societies weigh all lenses exhibited at their meetings and publish the figures obtained.

Mr. WOLLASTON did not see why the mounts should not be made of aluminium.

Mr. COWAN said that as aluminium did for opera glasses he did not see why it would not do for photographic lenses.

Mr. F. A. BRIDGE remarked that there was much difference in the weight of brass in lens mounts; the foreign mounts were usually very heavy. Much of the weight was in the tubes; the tubes perhaps could be made of aluminium, even if the cells were of brass.

Mr. HADDON thought that the flange should not be so near one end of the lens as at present, but be near the diaphragm slot, so as to reduce the vibration when using a shutter.

Mr. COWAN surmised that perhaps the maker would think that that plan would make the lens look smaller and not big enough for the money.

Mr. Plomer exhibited a photograph, said to be of a rainbow, taken by a friend of his when on board ship off the coast of Australia. One broad, nearly straight, shaded band crossed the picture from top to bottom.

The members generally expressed the opinion that a rope or metal bar out of focus near the lens had been photographed, and that the rainbow did not appear in the picture at all.

Mr. J. B. B. WELLINGTON had once photographed a rainbow; it made a very faint impression upon the plate.

Mr. J. J. BRIGNSHAW once obtained a broad band like that in the print before them upon a series of paper negatives, and had been unable to discover the cause of the phenomenon.

A few remarks were then made about the liability of insufficiently fixed paper negatives to darken all over by keeping, and the necessity for using a strong hypo solution when fixing negatives upon paper.

Mr. WOLLASTON knew of some beautiful bromide opal plates in the market which it was impossible to fix with a very strong solution of hypo.

Mr. ASHMAN had received Mr. Burbank's new book from America, and had carefully read it through; it professed only to be a compilation, but that compilation had been very well done, so that it was a practically useful book of reference. Had any one noticed the remarkable falling off in the actinic power of the light that afternoon? He had found it at least twelve times slower than usual at the same time of day.

Mr. BRIDGE had noticed it and found it to be about fifteen times slower than usual.

Mr. WOLLASTON had found at Chislehurst, a few miles out of London, that at twelve o'clock that day plates required double their usual exposure.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held at Myddelton Hall, Islington, N., on Tuesday, September 6, Mr. J. Traill Taylor, President, in the chair, Mr. Arthur E. Smith was elected a member of the Society.

A question was asked whether there was any advantage or disadvantage in constructing a doublet lens with the combinations of widely dissimilar focus.

The PRESIDENT said that rectilinear lenses were now frequently constructed with the back combination of shorter focus than the front, this system being found to conduce to flatness of field.

Mr. J. JACKSON had been in the habit of interchanging the combinations of his portable symmetricals, and found that he could obtain lenses of intermediate focus which worked thoroughly well.

The HON. SECRETARY in using his Darlot's combination set preferred to use a long focus front combination with a short focus back combination.

In opening the discussion on "Lantern matters," Mr. A. MACKIE said that when using a condenser, either for enlarging or for projecting a picture on the screen, it had been recognised as a principle that the source of light should be as nearly a point as possible. The oxyhydrogen light practically fulfilled this condition. When this was unattainable he thought that the arrangement suggested by Mr. Traill Taylor at the Conference of the Camera Club was worthy of consideration. This consisted in an adaptation of the alba-carbon gaslight fitted to the lantern, two burners being employed, one being about an inch behind the other with an air space between. Interposed between the condenser and the flame, as close to the latter as possible, was a diaphragm having a circular opening half an inch to one inch in diameter, the position of the diaphragm being such as to hide all the light except a portion of the most luminous part of the flame. The ordinary oil lamp had the disadvantage of unevenly illuminating the screen owing to the division of the wicks. He thought, however, that Mr. Taylor's principle might also be applied to oil lamps.

Mr. J. H. BIRD preferred the oxyhydrogen to the oxycalcium light.

The PRESIDENT said that with a little management a good illumination could be obtained by the oxycalcium light. The wick of the spirit lamp should be comparatively long, and should be split into two parts, between which the oxygen should be directed on to the lime. The President then described Professor Fairchild's method of preparing oxygen while the lantern exhibition or demonstration was in progress.

Mr. E. CLIFTON described the Brins Oxygen Company's light, which differed from the ordinary oxyhydrogen light in the use of a small ball of a comparatively indestructible substance in the place of the lime. This light, though admirable for house illumination, had the disadvantage for use in the lantern that the most intense part of the flame was at the bottom.

In a discussion upon lantern slides, the importance of adopting a uniform method of marking was pointed out, and it was explained that the standard system of the Photographic Club, which was now almost universally used, was that a white spot be placed on each of the top corners when the slide was viewed, so that the subject appeared as in nature, or a white line along the top edge.

Mr. CLIFFON spoke of the inconvenience caused by the use of glasses not uniform in size. He advocated that all slides be made on $3\frac{1}{2} \times 3\frac{1}{2}$ plates.

Mr. Higgins showed some slides on gelatino-chloride plates of his own manufacture printed out and toned with gold.

Mr. T. Utton showed a dark slide with bag attachment for changing plates in the field.

Next meeting will take place on Tuesday, September 20. Visitors are invited.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE ordinary meeting of the above was held in the Free Public Library on Thursday evening, the 8th instant.—The President, Mr. J. A. Forrest, in the chair.

The minutes of the previous meeting were read and passed.

Messrs. A. H. Martin, E. R. Wear, Joseph Joplin, and Julio Gonzobz, were elected as members.

Prints were exhibited by Messrs. Forrest, Riley, Eaton, Stansfield, and Lange; the latter had some very large ones by Messrs W. Cobb & Sons, Woolwich, taken on Jubilee Day in the vicinity of Westminster Abbey, of the royal procession *en route*, which compared favourably with those taken at the same time by other operators.

Mr. H. H. Williams showed an interesting instantaneous one illustrating the effect of firing a shot into water from an ordinary sporting breechloader; the amount of water raised as depicted was surprisingly great, whilst the spray therefrom had reached a height of some twelve to fifteen feet, and the gun in the hands of the firer, instead of aiming at the point of impact, as would be supposed it should, had "jumped" so considerably as to be represented in an almost horizontal position.

THE PRESIDENT read a paper entitled *How to Manipulate the Camera in a Military Manner* [see page 582], the novelty of a camera mounted on a gunstock in lieu of the orthodox tripod exciting a good deal of interest. It was thought by some to be an unnecessary addition to the *impedimenta* of a photographer, and that similar results could be obtained, when snap shots were required, by simply holding the camera in the hand and pointing it at the object to be taken, the finder showing when it was properly balanced on the plate.

Mr. FORREST, however, thought otherwise, and substantiated his case by showing some excellent prints taken as described in his paper.

A member stated that he dispensed with the use of a finder altogether, as he found in practice that by glancing along the top edges of his camera he could locate a view with the greatest accuracy.

Mr. H. WILKINSON took exception to the President's statement that after thirty yards a lens has no focus, as he had not found it so himself.

Some discussion took place on the subject, with the result that it was thought that the fact could not be looked upon as established, lenses varying much in this respect, especially when of the larger sizes.

The utility of detective cameras was illustrated by an account of a photographer who had recently visited the fleet with one whilst lying in the Mersey, and came away with a large number of views taken on the various vessels.

A number of queries in the question box having been replied to, and the members remained that the annual lantern slide competition takes place in October, the meeting broke up.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held on the 6th instant,—Mr. A. S. Platts occupied the chair.

This being the last meeting before the annual meeting, Messrs. Charlesworth and Spencer were appointed Auditors, and arrangements were made for a dinner to precede the meeting, which will take place on October 4.

Mr. J. W. CHARLESWORTH read a paper on *Notes on Development*.

Correspondence.

Correspondents should never write on both sides of this paper.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN EXHIBITION, 1887.

To the EDITORS.

GENTLEMEN,—Kindly permit me to remind intending exhibitors that Wednesday next, September 21, is the last day for receiving *packing cases* from the country, by our agent Mr. Bourlet, 17, Nassau-street, Middlesex Hospital, and also that the same day is the only one for receiving *pictures and apparatus* at the Gallery. Any further information may be obtained from me.—I am, yours, &c.,

5A, Pall Mall East, S.W. EDWIN COCKING, Assistant Secretary.

PYROGALLIC ACID AND ITS PRESERVATION.

To the EDITORS.

GENTLEMEN,—Referring to your leading article in last Friday's JOURNAL, I, for one, should be glad if you would give a little further detailed information on methods of using pyro preservatives. I find it utterly impossible to make a solution of pyro and sodic sulphite that is

not highly discoloured, unless I add such a quantity of free acid that the developing action of the solution is so greatly lowered as to render it almost useless for rapid work. Several friends have, to my knowledge, relinquished the use of sulphite on this account. You would, I am sure, do a kindness to others besides myself if you would point out plainly where we err.—I am, yours, &c.,

Icon.

[An article on the subject will be found in another column.—Eds.]

FOREIGN MADE LENSES AND THE MERCHANDISE MARKS ACT.

To the EDITORS.

GENTLEMEN,—Respecting the Merchandise Marks Act quoted in last week's JOURNAL, it may interest your readers to know that the Act became law when the Royal assent was given to it; and also respecting foreign lenses, Clause 3, Section 2, says, "applies to goods having thereon any figures, words, or marks, or arrangement thereof, as are reasonably calculated to lead persons to believe that the goods are the manufacture of some person other than the person whose manufacture they really are."

Now, gentlemen, you will see by my card, enclosed, that I am much interested in the Act and have studied it in many ways, and I think you will agree with me that according to the above clause that any dealer having lenses for sale not his own manufacture, and bearing his own name on them, and from this time sells them without informing his customer that they are not his own make (in writing and accepted by the customer, see Clause 17), will be liable to a prosecution, and the same rule holds good with any articles of merchandise or manufacture bearing names, words, or marks, &c., and the *onus* is thrown on the defendant to prove his innocence, or that he sold the goods without a guilty knowledge.

I certainly must differ from you when you say "most purchasers of lenses from dealers bearing dealers' names know quite well they are made on the Continent," &c., and consequently are foreign. I should rather say that most purchasers of lenses with a name of any kind on would naturally suppose they were of the vendors' manufacture, or at least manufactured for them. The same would apply to a watch, especially as the English goods bear a better reputation for strength and quality than foreign goods.

There is no doubt that dealers in every trade must now be careful what they are about, as hitherto so many, I will not say frauds, but misrepresentations as to the goods vended have been carried on, especially where names are concerned, that every purchaser must feel glad that some of these practices are now stopped. I could tell you cases that have occurred in the watch trade that would make your hair stand on end, aye, and in connexion with some of our best and most well-known names, and when they have been brought to book have simply returned the money. Now, I am happy to say, all that is at an end, and a prosecution will have to stand instead. Apologising for troubling you with this—I am, yours, &c.,
Clerkenwell, London, September 13, 1887. I. W.

SUPERIOR WORKMANSHIP.

To the EDITORS.

GENTLEMEN,—May I venture, as an old subscriber, to ask my brother amateurs through the medium of your columns whether their experience of what is advertised as "superior workmanship," and for which a proportionately high price is charged, runs upon all fours with my own, or whether I am especially unlucky?

I have worked for several years with a $5 \times 7\frac{1}{2}$ camera and changing box by Hare, when, in an evil moment, I thought, for the sake of the extra weight, I would try one of the much advertised light cameras, having in view a long journey abroad. I duly sent 13*l.* 6*s.* 6*d.* with the order, which was expressly stipulated for by the maker, a thing, by-the-by, which I will never do again, for I hardly see why I should trust the vendor with my money and risk getting the goods rather than he should trust me with the goods and risk getting his money; any amount of reference, if you please, but no more cash in advance.

[Here the writer enters into details of a commercial nature which it is unnecessary to publish.]

I started on my trip, and luckily encountered so much rough and stormy weather that I could use my camera but little. I say luckily, because, on developing my negatives since my return, I find many of them marked with two scratches across the whole length of the film, caused by the brass screws in the slides projecting on the inside. Of course the negatives are useless. I have written to the maker of the camera, and received in return a somewhat jeering letter about an enthusiastic amateur. So much in this instance for superior workmanship in return for a high price.

Now for experience the second. Having tried my 'prentice hand with fair success at enlarging, I decided to get an apparatus with lantern and condenser to suit my $5 \times 7\frac{1}{2}$ negatives.

I gave the order to a London firm with whom I had previously had satisfactory dealings, although their price was higher than that of some other good makers, but then I was promised superior quality.

The result is that I receive a set of apparatus so arranged that the flame of the lamp cannot be brought within three inches of the centre of the condenser, nor within five inches of the requisite distance from it to give a full disc of light.

In reply to my complaint I am told that they have copied it from that of another well-known house, but if I can suggest any alteration of detail they will carry out my ideas. As I can see plainly that the whole lantern must be remade, I have to send some miles to get a competent man to repack the case with a view to return it. How the matter will end remains to be seen, but this second case of superior workmanship at a high price is rather a caution to amateurs.—I am, yours, &c., H. A. S.

FIFTY SITTINGS FOR A PORTRAIT.

To the Editors.

GENTLEMEN,—In the interesting controversy in your JOURNAL regarding the above subject, there have been many and varied opinions given, but none which seem to refute the original assertion as made in the article on *Colouring as Applied to Photography*. I do not intrude these few lines, however, upon you in order to support Mr. R. Barrett's theory, but upon a matter which touches myself more closely.

The fact is, I wish to take exception to a remark made in your last JOURNAL by your correspondent, Mr. F. Wilcockson, regarding an engraver. He distinctly calls him a *mechanical* artist. May I ask him on what grounds he makes such an assertion? I have always found engravers, who are worthy of the name, to be men of very high artistic training and most superior draughtsmen. I think it rather hard, under these circumstances, that we should be classed as mere "*mechanical* artists."—I am, yours, &c., AN ENGRAVER.

To the Editors.

GENTLEMEN,—I follow with interest the various opinions of your correspondents on the above subject, but regret to say they seem to get away from the original point at issue. If I read aright, I believe Mr. R. Barrett always speaks of *good* work; and therefore it would be best only to argue it from that point, as he was the author of the article which led to the present discussion. Your correspondent, Mr. Wilcockson, gives as an example, in your last JOURNAL, a *coloured photograph*, and that rather poorly done. I think it would be better to consider this matter from the point, not of painting on a *photographic base*, but painting on an ordinary canvas when photography is only looked upon as a *help*.—I am, yours, &c., ONE WHO DOES NOTH.

To the Editors.

GENTLEMEN,—In your JOURNAL of last week "A Painter," in reply to "Free Lance," makes some remarks about the discolouration of portraits. Will you permit me to ask him the circumstances under which portraits in oil (not on photographic base) will become discoloured as described by "Free Lance," and the causes that lead to same? I would also like to know how to *restore* them to their original state. I can well understand the coloured photographs becoming discoloured, as I have had experience of it, but have never had the experience of a painting in oils, by "an artist of repute," too, doing the same thing.—I am, yours, &c., AN AMATEUR.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED:—

- A. G. Patherick, 11, Alfred-street, Taunton.—Photograph of Jubilee Car of the Taunton Manufacturing Company.
- N. M. Phillips, 60, Oxford-street, Southampton.—Three photographs of Rev. Thomas Nicholson.
- G. Donney, 21, St. Sidwell-street, Exeter.—Photograph of Theatre Royal, Exeter.
- G. V. Yates, Davy's-buildings, Fargate, Sheffield.—Four photographs of Sir Henry Stephenson, Mayor of Sheffield.

- C. TOMLINSON.—We will try the solution.
- R. D. H. B.—We have forwarded your application to Mr. Chadwick.
- H. A. G.—The prints to which you refer are simply very highly burnished.
- R. C.—Crimson lake from cochineal or alizarine lake are not permanent if they are exposed for a long time to sunlight; but the latter is the best of the two.
- T. G. B. inquires what is the best artificial light (not electric) for portraiture.—Next to the electric light we should say, all things considered, that magnesium is the best.
- C. BUTT.—Guttapercha is not a good material for vessels which are to contain a silver bath unless it be well coated with shellac. Such vessels are in use and are well spoken of at the Ordnance Survey Office, Southampton.
- R. C. MACLEOD.—1. The stain looks very much like imperfect fixation and the light acting upon it. A similar stain may, however, be produced by contamination with silver while the prints are washing.—2. The negatives were no doubt not sufficiently washed, and contact with the silver paper has caused the spots and stains.—3. You have over exposed.
- C. STEPHENS.—It is very evident that the body of the flame has been very much too large. Cut off the whole except the space of half an inch by placing an opaque diaphragm immediately in front of the flame, and you may depend upon it that sharpness will result unless there is something radically wrong with the condenser. Try this and write again.

COL. GUBBINS.—The exposure given to the print, namely, over two and a half hours, indicates something radically wrong. The light, though apparently strong, must have been of an unusually non-actinic character. Two or three cheap paraffine lamps placed behind the two thicknesses of ground-glass should give sufficient light to enable the enlargement to be made in a moderately short time.

B. H. G. writes: "I have a stereoscopic lens by a noted maker; in every picture I have made with it there is a small circular area in the centre of the plate that is too dark, and which, of course, appears in the print too light. What is the cause of this? and is there any remedy for the evil?"—The evil is what is known as a flare spot. The remedy is to alter the position of the stop by placing it nearer to or farther from the lens. A few experiments will show the exact place where perfectly even illumination will be secured.

W. B. CASSINGHAM writes: "1. I always use distilled water (free from ammonia) for mixing all stock solutions, but when developing I use plain tap water for making up the developer; is this equal to rain water filtered, or would it be better to use the latter for the developer, hypo solutions for plates and prints, also toning bath?—2. Is two ounces hypo to the pint of water sufficient for fixing prints, or is it better to have it the same strength as for plates?—3. How much liquid ammonia ought to be added to the pint of hypo solution?"—1. Ordinary tap water will answer quite as well as distilled for the purposes mentioned.—2. Four ounces to the pint is the best strength.—3. Ten minims.

SPOTTER says: "I use a mixture of Prussian blue, sepia, and crimson lake, with the white of an egg, for spotting prints, and I am annoyed to find that on looking over prints a few weeks old that the two colours, sepia and lake, have entirely faded and left the spots filled up with the blue alone. I use the best colours I can procure from Rowney. If you can tell me the cause of the above and a remedy I shall be greatly obliged."—Crimson lake is one of the most fugitive of colours when exposed for a time to strong daylight, and for this reason should not be used. Madder colours are somewhat more permanent, and are therefore preferable. Madder brown is a very useful colour in spotting photographs.

REX asks: "Can you please tell me how it is that my prints fade so much when I put them into a fixing bath of two and a half ounces of hypo to twenty ounces of water with ten drops of ammonia? I may say that I thoroughly wash prints at first in many changes of water before toning; after toning they are put into fresh water with a pinch of salt in, then in fresh water again before putting into the fixing bath. However dark I have the prints to begin with the result is, when finished, a very weak, thin sort of print."—From the data furnished it is difficult to say the cause of the trouble unless it be that the prints are over toned. We do not see the utility of the "pinch of salt" treatment after toning. If used at all it should be before toning, but this will not account for the trouble.

WORRIED writes as follows: "I am using a ready sensitised paper, and made up two baths as a test, and both after toning (very slowly) a few prints stopped toning, and the prints began turning the colour of the one enclosed (not from want of gold), and the bath was neutral. I let them remain in the bath two or three hours, but they did not attempt to tone. I took every precaution in making the bath, and used three grains of gold, one drachm of acetate of soda, water, twenty-four ounces, as I have usually done for other papers. I should be extremely glad of any suggestion, as I have one quiro on hand and cannot afford to waste prints continually. Do you think for a small business sensitising one's own paper is more economical than using ready sensitised paper?"—It would appear that the paper is at fault if it so obstinately refuses to tone. We should recommend our correspondent to try the effect of immersing the prints in a very weak solution of common washing soda—say a piece the size of a hazel nut in a pint and a half of water—prior to toning. The discolouration seems to be due to light while the prints are in the toning bath. On the whole, we think that ready sensitised paper is the more economical when the consumption is small. When the paper is sensitised at home there is considerable waste unless it is used up quickly, and this cannot always be done when the light is bad.

ERRATUM.—In our issue for the 2nd instant, page 553, second column, line thirty from bottom, for "M. Boissonas, of Lyons," read "M. Boissonas, of Geneva."

A CORRESPONDENT writing from Falmouth, where the Exhibition of the Royal Cornwall Polytechnic Society is now open, says—"The exhibition of photographs is grand."

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting of this Society will be held on Tuesday next, September 20, at eight p.m., at the Gallery, 5A, Pall Mall East.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, September 21, 1887, will be on *Lenses*. Saturday outing at Rainham. Train from Fenchurch-street at thirty-two minutes past two.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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PLATINOTYPE PRINTING.

PLATINOTYPE, though the simplest of all printing processes, is yet liable to be, and is, considerably misunderstood by many who have little practical acquaintance with its methods, this very simplicity, perhaps, being one cause leading to the existence of these false impressions. For example, it is often said there is no control over the depth of printing, merely because it is thought that a print once out of the frame is complete for good or for bad. But it is forgotten that precisely the same state of affairs exists in the case of a silver print; and, as a matter of fact, there is a very appreciable variation in the possible ultimate depth producible in a platinum print, by varying the heat of the developing bath. Thus, if several prints are made from one negative, and it be shown when the first is developed that an error of judgment has been made in the depth, a lower temperature for a too darkly printed, or the bath made nearly boiling for a slightly printed proof, are capable of modifying the depth of colour sufficiently to ensure a batch of good prints, unless the error has been considerable; but at the same time there is not the latitude that carbon printing permits. With regard to the power of judging of the right time to take a print from the negative, those of our readers with any experience of the process will join us in saying that it need be no bugbear at all. An experienced man will be able to tell, almost as readily as with silver, when a print is deep enough, and if the experience is wanting nothing is simpler than to run a "pilot" print in silver. A small piece of silvered paper is placed under any spare negative, the smaller the handier, and exposed to light at the same time as the required platinotype under its negative, and both are turned down at once. If the latter prove to be correctly exposed the silver print will be a guide for the next exposure, another piece of silver paper being put into its frame and printed along with another platinum; when the silver print is the same depth as the first the printer may be absolutely certain his platinum is right also. Should the trial print be too light or too dark the pilot print may be varied accordingly. In our own practice we generally adopt this plan as against using an actinometer, whether for carbon or platinotype, though we can usually trust our judgment in the latter after simple inspection.

The advocates of silver point out that there is no range of tone in these pictures; but even that is only partially true. Given a particular sample of sensitised platinotype paper, and the variation of colour under control it is true is practically *nil*; but quite apart from the fact that sepia tones are obtainable with the Platinotype Company's materials, there yet exists a decided range in the tones of black that it is possible to obtain with

the process. We suppose the number of photographers who sensitise their own platinotype paper is only small; but, as may be seen in that very interesting monograph on the subject by Pizzighelli and Hubl, the colour of the finished platinotype print is capable of being influenced by variations in the sensitising and developing bath, and also by the sizing material employed. But, be this as it may, with the paper now purchasable ready prepared for use no one need produce a print of that extremely disagreeably cold tone that once was far from uncommon with the process.

There is another property of the ready sensitised papers which is too little noticed: they do not all give the same character of print as regards hardness and softness. We have seen excellent negatives give at one time prints so hard that no one would care to possess them, and on another occasion prints just perfect as regards gradation. The photographer who desires his prints to excel should not ignore, as to our knowledge is commonly done, this elementary piece of platinotype lore. Indeed, we believe that if negatives of unusual hardness are to be printed from, it is possible to obtain from the patentees paper specially prepared to give half tone in excess, which will give capital prints from such negatives. The difference producible by the mere fact of choosing the right paper is sometimes that between what, practically, is success and failure. Now the most ardent advocate of printing on albumenised paper will not claim the possession of this range of qualities by different samples of paper, though it must in justice be stated that in the matter of "hardness" and "softness" of results there is more range among the various papers in the market than many are aware of. In a general way, however, the silver printer varies his results in this respect not by choosing different papers, but by the strength of the light in which he prints, and thus renders some considerable range available for his purposes.

This leads us to the vital point of the process, the question whether in practical everyday work an ordinary unselected batch of negatives may be printed from in platinotype with as much satisfaction as in silver? To get a satisfactory reply to this query we must look at it in two aspects. We must first ask whether for artistic work it is worth while getting prints—in silver, platinum, iron, or any medium whatever—that are only makeshifts, tolerated, below *par*? There can be but one reply. It is that—granting artistic work, and not merely pretty memoranda to be the goal—nothing that is gravely deficient in artistic quality should be produced at all. But then, in actual practice, artistic excellence is not the only goal; large numbers of pictures are produced which are interesting to their owners, and perhaps a few others, whatever their artistic

merit, so that it is evident æsthetic excellence cannot be looked upon as a *sine quâ non*.

The second aspect is as follows:—The peculiar excellence of a platinotype print is its artistic beauty; it has neither the brilliancy, the richness, nor the force of a silver print, but in lieu of them it possesses a beauty all its own, more nearly approximating—though yet a long way from it—the charm of a steel engraving. To print, therefore, an indifferent negative, in what may perhaps be called a special process, would be a mistake, and it is fortunate that it is so. There are negatives in existence which will give albumenised prints of presentable, perhaps, indeed, excellent quality, which it would be useless to attempt in platinotype, as the result would be grey, cold, and flat in the extreme. But given a good negative, well exposed, not too thin, and with a fine gradation and range of tones, and by this process we may obtain pictures rich, delicate, with a complete range of tone from white almost to black, free from heaviness in the shadows, and which, in fact, are, we will not say unrivalled, but most difficult to rival by prints by any process in the whole range of photographic technics.

SULPHITES IN CONJUNCTION WITH PYRO.

II.

But it may happen that a reliable sample of sulphite is not obtainable, in which case a ready means of manufacturing it as required is desirable, and fortunately this is a matter of the greatest ease, the materials and appliances requisite being obtainable in any modern photographic laboratory. These consist of our familiar friend hypo, common washing soda, hydrochloric or sulphuric acid, a glass funnel, some glass tubing, and a bottle fitted with a cork perforated with two holes, or a two-necked Woolff's bottle may be substituted for the funnel and one of the perforations in the cork. If the funnel be employed it should be fixed in a convenient stand and connected with a straight glass tube by means of an inch or two of rubber tubing, the latter so arranged that by means of a pinching clip a liquid poured into the funnel may be arrested, or allowed to flow, as desired. If it is to be frequently used a "separating funnel" with glass tap will be useful. The straight glass tube is passed through one of the perforations in the cork, and must reach to the bottom of the bottle, in the other orifice being fixed a bent leading tube reaching only just through the cork, to allow the gas to escape as formed. If the Woolff's bottle be used, the leading tube will occupy one neck, the other being fitted with a stopper, by means of which the acid is introduced gradually as required.

Introduce a pound of hypo into the bottle with a little water, not necessarily sufficient to dissolve it all, and insert the cork with its arrangement of tubes. In a separate vessel—a deep basin or jar will answer well—place a solution made by dissolving half a pound of ordinary washing soda in a pint of warm water, and into this solution insert the bent tube leading from the hypo bottle, thrusting it to the bottom of the vessel. Have ready a pound of the strongest commercial hydrochloric acid and a stirring rod.

These arrangements made, by means of the funnel and pinch-cock introduce the acid, a little at a time, so as not to set up too violent an action, into the hypo solution. Decomposition with effervescence will ensue, sulphurous acid being evolved and passing over by the bent tube into the solution of carbonate of soda, chloride of sodium being at the same time formed, and

sulphur precipitated in the bottle. Upon the gas passing into the carbonate of soda solution, it displaces the carbonic acid, and a second effervescence is set up as that escapes, and the solution should be constantly stirred in order that the sulphurous acid gas may be brought thoroughly into contact with the undecomposed carbonate. The hypo bottle, also, should be occasionally gently agitated in order to mix its contents. When upon the further addition of acid no effervescence occurs, and the gas ceases to pass over, the operation is complete.

The carbonate of soda will now have been converted into acid sulphite of sodium, or bisulphite, in which condition it may be used for dissolving the pyro, and will prove a powerful preservative, only it will have to be borne in mind that a large allowance of alkali must be made in compounding the developer to neutralise the free acid—one point which a correspondent in last week's JOURNAL appears to have systematically overlooked. Sulphurous acid, it may be remarked, is dibasic—that is, it forms two series of salts, one neutral and the other acid, the latter formed by saturating carbonate of soda, as we have done with the gaseous acid. To make the neutral salt the acid solution is mixed with an equal quantity of carbonate of soda to that used at first; we have next, therefore, to add another half pound of washing soda. In order, however, that the adjustment of acid and alkali may be accurately performed, we will reserve a small quantity—say, an ounce—of each, setting aside that quantity of the solution, and adding to the remainder seven ounces of carbonate. When dissolved, if the solution be alkaline, as may happen if a considerable quantity of the sulphurous acid gas has escaped combination, add little by little from the reserve portion until litmus paper is reddened and bleached. If, on the other hand, it be still acid, add from the reserve of soda, and by using one against the other, the reserve portions will enable the final state of the solution to be left just on the side of acidity.

If the operations have been carefully performed, and the whole or greater part of the gas utilised, the solution of sulphite will now perhaps be over saturated, and will have thrown down a crop of crystals. If so, a little more water may be added to dissolve them. In any case the result will be near enough to a saturated solution to be used as such.

The operation as described may seem tedious, but in reality it is one of the greatest simplicity. At the same time, when a reliable supply of sulphite is available, we are far from recommending its home manufacture; but when it is not readily obtainable, the plan we give supplies an article that may be thoroughly depended upon as a preservative, and which, if carefully neutralised, will be as free from retarding action as can be.

A word regarding the use of the acid-sulphite. Those who attach importance to the purity of the colour of the solution and who desire a preparation of undoubted keeping qualities may, with advantage, dispense with the addition of the second portion of carbonate of soda. But as we have already pointed out, care must be taken that the proper allowance is made in the developer for the free acid it contains. What this allowance should be it is impossible to say without testing the solution, but this is an exceedingly simple matter. If the usual quantity of the bisulphite solution for one developing operation be measured out and diluted with water, and the stock ammonia, soda, or potash solution dropped cautiously into it until, after stirring, red litmus paper has the colour changed to purple, the quantity so added will represent what

has to be used for each plate in addition to that directed in the formula. This quantity may be borne in mind or the formula of the stock solution itself may be altered in accordance with the requirements.

The bisulphite has a further advantage, inasmuch as when necessary it enables a very concentrated preservative solution to be made; for while the acid salt is quite as soluble as the neutral sulphite it possesses about twice its preservative value. In this respect the meta-bisulphite of potash, a more recent introduction, behaves similarly, but we are not aware whether or not it is a sufficiently definite compound.

In many of the modern formulæ in which the carbonate of potash or soda is employed, it is the custom to combine the preservative with both pyro and alkali, a practice adopted for the purpose of ensuring uniformity of action, when the proportions of the two solutions are varied. This appears to us a useless refinement, for slight variations in the proportion of sulphite do not materially alter the character of the image, while, so far as the effect upon exposure is concerned, the increase of the proportion of the pyro solution to meet over exposure will work towards the same end by introducing a larger quantity of acid and so further lowering the energy of the mixed solution.

In conclusion, we repeat that if a pure sample of sulphite be employed, or a freshly made solution such as we have described, and rendered acid before dissolving the pyro, such a preparation will retain its energy and clearness for a very long period, extending, as we have found in our own practice, to years, and if properly used will be free from any retarding influence in development.

ANOTHER Parliamentary session has closed, and the question of copyright in works of fine art and in photographs is left as it was. The projected Bill has, as on many previous occasions, suffered in the "slaughter of the innocents." This, in the present instance, will, of course, surprise no one, seeing the immense amount of time matters of more national importance have absorbed. Perhaps, however, next session, as it has been announced as a Government measure, the long promised, or threatened, Bill—for it is looked upon rather in the latter light by many photographers—may share a different fate.

As the employment of the collotype process is becoming more and more extended, so the necessity of reversed negatives is increasing. Perhaps, of all the many methods by which they may be, and are, produced, that of taking them direct in the camera by the aid of a prism or mirror, is, on the whole, the best; certainly it is the most convenient, and possibly, is the one most generally employed commercially. At the present time prisms are seldom used, except for lenses of small diameter, on account of their costliness. Hence, silvered glass mirrors, placed at an angle of 45° to the axis of the lens, are now almost universally employed in practice. They are cheap, and, if well made, answer the purpose admirably.

WHICH is the best position to place a reversing mirror, in front of, or behind, the lens? In England it is usual to fix it in front, and in Germany—where reversed negatives are more in use than here—at the back. From an optical point of view, it makes very little difference which, but practically the posterior possesses many advantages over the anterior position, and, for this reason, it is surprising that the latter is still retained by so many photographers. When the mirror is arranged in front of the lens, its silvered surface is, of course, exposed to the atmosphere and any noxious vapours it may contain, during the whole of the time the image is being focussed and the negative taken. Hence, it quickly loses its lustre and requires repolishing, which tends to wear away the thin film of silver; it is also liable to accidental abrasion. Again, the mirror has to be removed from the camera every time it is required to change the lens.

Furthermore, when the camera has to be brought close up to the object to be copied, and the lens is of short focus, the fittings of the mirror may obstruct the light, or even cast a shadow upon it. These inconveniences, as well as the disadvantages, may be avoided if the mirror occupies the posterior position. There it is better protected from atmospheric influences and accidents. The lens may be changed without disturbing the mirror or its fittings, and they, of course, will not interfere with the illumination of the object while it is being photographed.

ALTHOUGH the back position for a reversing mirror is far preferable to a front, the best place of all for it is between the components of the combination, which it is scarcely necessary to say must then be mounted at right angles to each other. In this position it is perfectly protected from injury, and is not exposed to atmospheric influences. When so placed, a much smaller mirror will serve—indeed, it need be but little larger than the stop with which the lens is worked. This plan of fitting the reversing media was introduced some ten years or so ago by M. Derogy, but it has not, so far as we are aware, been very generally adopted. It is somewhat difficult to see why this should be the case seeing the advantages it offers.

By the way, reversing mirrors are frequently injured through want of care on the part of those employing them. If they are much exposed to the air during damp and foggy weather, such as that which may shortly be expected, the silver rapidly becomes tarnished, and then a much longer exposure of the negative is necessitated. And it should be borne in mind that every time the reflecting surface is polished the thickness of the thin film of metal is reduced. For this reason the mirrors should never be exposed to the atmosphere for longer than can be avoided, and they should always, when out of use, be kept in a dry place. Before commencing to repolish the surface, care should be taken that it is perfectly dry, for if it be damp the silver may rub off. To guard against this it is a good plan to always make the mirror slightly warm in front of the fire before commencing to polish.

THE present is about the best season of the year for securing good cloud negatives. About the time of the equinox—vernal or autumnal—as a rule, grander cloud effects, and a greater variety of them, are to be seen than at any other period. Few photographers, amateurs in particular, possess a really good stock of cloud negatives, yet they are not difficult to obtain during the early spring and autumn months. Nothing looks much worse in a collection of photographs than to see the same clouds introduced in several different subjects. Yet we often meet with examples of this even in the leading exhibitions. It is to be hoped that in the forthcoming one in Pall Mall such things will not be seen.

In a recent number of the *Photographische Mittheilungen*, Herr E. Vogel describes different methods of imparting a gloss to platinum prints, and even for "enamelling" them. Most persons consider that the matt surface and engraving-like appearance is one of the principal charms of platinum pictures. To confer upon them a glossy surface, or, worse still, to enamel them with gelatine and collodion, would be to destroy all their artistic qualities. How would a fine mezzotint engraving look if it were enamelled? Certainly quite as well as a platinum similarly treated. However, no one with any artistic feeling would think for a moment of doing either the one or the other.

LANTERN SLIDES ON GELATINE PLATES.

II.

In making an emulsion for lantern slides I vary the process rather materially, both as regards formula and procedure. As the aim is not to make a rapid but a clean emulsion, we can afford to neglect some of the precautions necessary to the production of great sensitiveness, and their omission assists in securing quality and fineness of deposit.

With regard to the formula, I shall give a choice of two which I like equally well, a bromo-iodide and a bromo-chloride, both of which give better tones than bromide alone, and each possessing certain points in its favour. The bromo-iodide gives rich, clear images of various shades of warm brown to black with ordinary pyro development, and the deep colour given to the film by the iodide pre-

vents the spreading of the light in the gelatine itself and helps to give clear, sharp outlines. The bromo-chloride plates give a cooler toned image with ordinary development, but by increasing the exposure and using ferrous oxalate or ferrous citro-oxalate they yield a wide range of warm red colours which will bear toning with gold or platinum.

The proportion of iodide to bromide may with advantage be very considerably increased as compared with what is desirable for rapid landscape plates, and the colour of the image may thus be very greatly modified; but it is not well to go beyond a certain point or a difficulty will be experienced in getting density. In the same manner the proportion of chloride may be increased, but if pyro development is to be employed, this, too, must be done with caution. The two following formulæ represent the qualities I have found best:—

BROMO-IODIDE EMULSION.

Bromide of ammonium	60 grains.
Iodide of ammonium	20 "
Gelatine (Heinrich's or Coignet's).....	180 "
Nitric acid, s.g. 1.4	2 minims.
Nitrate of silver	120 grains.
Distilled water	10 ounces.

BROMO-CHLORIDE EMULSION.

Bromide of ammonium	35 grains.
Chloride of ammonium (or sodium).....	30 "
Gelatine	180 "
Nitric acid	2 minims.
Nitrate of silver	120 grains.
Distilled water	10 ounces.

It may be remarked here that as in the latter formula there is a large excess of soluble chloride, the whole of the soluble bromide being taken up, the difference in the equivalent weights of the chlorides of ammonium and sodium is of no consequence, and either can be used as may be convenient. With respect to the gelatine, I prefer very much to use Coignet's when I can get a sample free from "pits" and spots, as it appears to me to give a brighter and clearer film and to set more firmly than others. Failing that I fall back upon Heinrich's.

Then, again, as we are not in search of rapidity, we are not under the necessity of emulsifying in very weak gelatine in order to bring about the rapid combination of the elements; on the contrary, by preference I emulsify in the full strength of the gelatine, which makes it easier, and produces an extremely fine deposit without the slightest trouble. In order to get what sensitiveness is required, the emulsion will bear a high temperature for a long period without bringing on fog or coarseness or destroying the setting power of the gelatine.

I spoke in my previous article of the desirability, as far as possible, of avoiding the formation of insoluble calcium salts, and the first step in this direction is to use distilled water, and the following is my method of producing a clear, bright solution of gelatine. I may say that I have tried various methods of using albumen for clearing the gelatine, but have not succeeded in finding an efficient one, so have settled down upon the domestic "jelly bag" plan. I dissolve the gelatine, 180 grains, and make up to six ounces with distilled water, after soaking thoroughly also in distilled water, during which time the flakes are thoroughly rubbed one against another to remove as much as possible of the adherent dirt and grease. It is surprising what a quantity of fibre from the nets upon which it is dried becomes adherent to the gelatine, but much of this can be removed in the manner I have described. When the gelatine is dissolved I raise the temperature to about 180° Fahr. in order to increase its fluidity, and then proceed to filter in front of a hot fire. The filter I use consists of a conical bag of swan's-down, double thickness, sewn separately, and the seams at opposite sides. Into this I frequently drop a folded filter paper, but though it then filters less rapidly I cannot say that the action is any more perfect.

This bag I suspend in front of the kitchen fire by any convenient means and as close as may be necessary to keep the gelatine hot; the latter is then left to run through at its leisure, but the operation is by no means a long one, and I usually repeat it. The result is six ounces of a thirty-grain solution of beautifully clear gelatine. I prefer to filter the gelatine in this manner before emulsifying or even bromising, because it can be done without having recourse to the

dark room or elaborate arrangements for keeping up the temperature, and also without upsetting the equivalents of bromide and silver.

Next I add the soluble haloids, dissolved in two ounces of distilled water, and, finally, in the dark room, the silver and nitric acid, also dissolved in two ounces of distilled water and brought to the temperature of the gelatine. No special care is requisite in adding the silver solution very gradually, as is the case when the emulsification is performed in a two or three grain solution. It may be poured in a steady stream into the gelatine if the latter is kept well stirred with a glass rod, or, better, a flat strip of glass or wood. When mixed, the emulsion is left to ripen. This may be done either quickly or slowly, at a high temperature or a low one. No harm is done to the gelatine or its setting powers by boiling for half an hour, but the method I usually adopt is to mix at about 180°, and keep up that temperature or thereabouts for a couple of hours, when I find the sensitiveness all that I require, namely, about ten on the Warnerke sensitometer.

The next operation is the freeing of the emulsion from soluble salts; to effect this it is first allowed to set thoroughly. There is no necessity for the use of ice for the purpose of causing it to set hard, except, perhaps, in abnormally hot weather; if the jar or vessel be placed in cold water, or a wet cloth be wrapped round it and water allowed to trickle slowly on to it, the contents will be found quite firm enough at the end of a couple of hours, but the best plan is to leave it all night.

The mass is next pressed through coarse canvas, or otherwise divided into small fragments, and covered with distilled water, in which it is allowed to soak for ten minutes; this is poured off and replaced by a fresh supply, the divided emulsion being well stirred and again allowed to soak for ten minutes or a quarter of an hour. After this three or four more changes of distilled water are used, but each is allowed to remain for an hour and the emulsion stirred at intervals.

Another plan I sometimes adopt if I have not sufficient distilled water at hand is to precipitate with alcohol. The ten ounces of emulsion is allowed to cool down to about 120°, and then a pint and a half of methylated alcohol carefully filtered and raised to the same temperature is poured into it and briskly stirred; if on the addition of the whole of the alcohol the emulsion does not separate continuous stirring until it commences to clot, and as it cools down it will be found to separate in a far more convenient form than when the alcohol is used cold. In that case the emulsion solidifies into a tough, leathery mass, which is difficult to treat in any manner, but by warming the alcohol the precipitation is more gradual and in the form of separate clots.

Drain off the mixed alcohol and water, which now contain the whole of the soluble salts, or nearly so, and cover the emulsion with distilled water, leaving it to soak for an hour to extract as much as possible of the alcohol left clinging to the spongy mass of gelatine; repeat the treatment once more, then remelt the emulsion and make it up to ten ounces. Or, if preferred, after precipitation the emulsion may be dried and preserved in that state for future use. This will be found very convenient when only small quantities of emulsion are required at distant intervals, as the one trouble of manufacture will serve for several batches. If thoroughly dried, as it should be to keep well, thirty grains of the "pellicle" will be equivalent to one ounce of emulsion, and simply requires soaking for an hour or two in distilled water previous to dissolving by heat.

Beautifully clean results may also be obtained by means of any of the "precipitation" methods of emulsification, that is, when the silver haloid is formed in so attenuated a solution of gelatine that it may be separated by subsidence, or, as in Monckhoven's plan, when washed carbonate of silver is converted into bromide by means of hydrobromic acid. These, however, involve a considerable amount of trouble and, in the latter case, chemical calculation, and are in no way superior to the simpler method I have described.

However the emulsion may be completed it must be finally filtered before use, but if the first filtration of the gelatine has been properly done, simply running the emulsion itself through a double thickness of muslin is all that will be required.

The plates should be very thoroughly cleaned and polished before coating. I prefer, though it is more trouble, to polish the glass

finally with powdered talc, but this necessitates a subsequent very careful dusting to remove any adhering particles, which would cause spots if allowed to remain. Still the treatment appears to give the gelatine a better hold of the glass, besides rendering the plates less liable to slight veil in the shadows, apparently between the film and the glass.

It will well repay the trouble to exercise very special care in coating and drying the plates. I prefer to coat and level each little plate separately, and to examine carefully for defects before placing in the drying cupboard. It may consume more time, but in an hour or two a very large number of plates can be coated, and the satisfaction remains of knowing they are as near perfect as can be attained.

Methods of development must be reserved for a concluding article.

W. B. BOLTON.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

HAVING carefully and successfully accomplished our *washes*, and got them evenly over our photograph, we can (having *picked* or *wiped* out our high lights) proceed to perfect our work by the aid of *hatching* or *stippling*. We have the option of style, as both these systems of work will yield the most satisfactory results, or a judicious treatment somewhat between both will enable you to produce a good picture. Stippling alone will give a very fine and elegant finish to a portrait, but it will necessarily lack breadth, and sometimes vigour, and this would in some cases be very fatal to the production of a faithful likeness. I am sure, on thinking over it, you can call to mind many faces that could not be done justice to by such a system of work as stippling, and this only on account of its fineness of texture and natural beauty, but which would neither lend themselves to the semblance of the original.

In the same way, by *hatching*, a very beautiful but bolder style of portraiture can be successfully produced, but there are many subjects much too delicate in themselves to be faithfully represented by such a treatment. Of course, a good likeness may be secured, but there will be something wanting. This want will be found to be simply texture—in other words, the treatment is not delicate enough to adequately represent the appearance of the original.

Both these styles are good in themselves, but they have each their favourable class of subject, and therefore I advise a mastery over both, in order that, by a judicious intermingling of both, the student may be able to gain any result that may be required. Not only this alone, but he will be able to impart vigour, feeling, and breadth to even the most delicate subject he may be called upon to paint, and of course in his bolder subjects can produce any degree of fineness or finish that may be desired, and yet preserve the natural and distinctive features of the original. I have seen most beautiful results in both these styles in their purity, and, from an artistic point of view, could naturally not help admiring them; but, as I said before, they each require their special and favourable subjects to be *truly successful* as portraits. Of course, I am laying down my principles from the standpoint "that the nearer we get to nature the more perfect is our work." I have positive ideas on some subjects, and this is one of them—a portrait *must* be a *likeness*. If a likeness be not secured, I will not have it as a portrait, no matter what its artistic merit may be as a *picture*. I think, too, that all students should *start* with the same principles, however much they may afterwards wander away from them.

We will now direct our attention to the methods of working these two styles. We will take *hatching* first. HATCHING may be said to consist of working your colour in a series of short strokes, which may almost be termed lines, but observing carefully that they follow as nearly as possible the form of the various features. Considerable study and practice will be found necessary to acquire a perfect knowledge of the directions in which these lines should go. The least mistake in such a case would not only spoil the result you have in view, but would be absolutely fatal to it. The more closely the student examines this the more he will recognise the fact. If it should not appear of sufficient importance to him, let him (after having acquired a mastery over the correct style) alter or falsify the

* Continued from page 570.

correct direction of these lines, and I feel sure I can leave the results to speak for themselves.

It will be found that these strokes or lines should take a somewhat horizontal direction on the forehead; they will be somewhat curved about the eyes, mouth, and general contour of the face and neck. This completed, these strokes are then crossed with others of a similar nature. These, however, must never cross the first lot at anything approaching a right angle, but rather, although *crossing*, preserve a feeling of appreciation as before for the formation of the feature under treatment. All these strokes should be produced by a firm touch, although at the same time the brush should be rather lightly held between the fingers, and with an effort to keep each stroke as equidistant from the other as possible.

Another point to be cared for is the working and condition of the *brush* while hatching. The colour should be carefully mixed, and be neither too dry nor yet too moist. The necessary moisture of the colour is considerably influenced by the material one is working upon. If this be not attended to, or the brush charged with too much colour, it will be found that a kind of blot or blob, as it were, will be deposited at the end of each stroke. This, it is needless to say, would be ruinous. In larger styles of work, hatching is almost exclusively practised (stippling being practically useless beyond a certain limited dimension), and should therefore receive a due amount of attention. In water colour, speaking generally, it may be considered the chief method of working the flesh, and should consequently be practised in every possible way in order to acquire a thorough certainty and freedom of hand, which alone can secure artistic merit for your work as well as make it a success as a portrait.

Stippling will be found to be a somewhat similar process, except that fine dots made with the point of the brush are employed instead of the strokes or lines of hatching. As in hatching, regard should be given to the formations of the features, although in stippling one is not so bound by them. A face will not be very artistic or satisfactory even with a system of fine dots evenly worked over its surface, no matter how regular and carefully placed they may be. No; due consideration must be given to the various formation, and the greatest care taken to preserve same while working.

Whether hatching or stippling, the result we want to secure is depth, and at the same time transparency. Besides this, by such treatment we secure or retain a much greater purity of tint than could ever be accomplished by a washing of mixed colours. There are many delicate touches of colour that can be placed just where required which would be impossible except by the aid of these methods. This, perhaps, will prove sufficient to say on these points.

I will now give a few *hints* which may be found worth keeping in mind when working, and which apply alike to all classes of painting, whether in oils, water, or dry colours.

It will be observed that all *fleshes*, as they retire from the eye, appear to become colder in tone, and must be treated by us accordingly, or we will fail to reproduce a truthful result.

If closely observed, it will be found that all the *high lights* of flesh incline to somewhat of a *yellowish* white. Often, by inattention to this fact, many careless painters lose considerable effect, or at least mar it.

The judicious balancing and keeping in proper subordination of what may be termed the *half lights* in comparison to those of greatest prominence will impart brilliancy, and do much to enhance the general effect and vigour of your picture.

As *shadow* may be described as the *absence of colour* (for without *light* there is no colour), so every gradation, as it deepens in its progress from light to shadow, must be adequately represented by a gradation from colour. The colour, therefore, in all shadows should never be vivid or bright, but be always kept in thorough subordination. Sometimes, one is obliged by surrounding circumstances to make the colour visible, but in such cases it should be depicted in the most subdued tone.

On close examination, it will be found that *local colours* are not visible in the highest lights, as also in the deepest shadows; but, if considered well, this fact will be found to be the inevitable result of nature as it affects colour. The edges of all *reflected* or *cast* shadows will be observed to be of a *grey* tone.

All *warm colours*, or those approximating in hue—be they simple

or compound—to either red or orange, *advance*, and become assertive in a picture.

Cold colours, or those approximating in tone to blue, will, on the contrary, *retire*, and give the idea of going into distance.

By *contrasts* brilliancy of effect may be gained, but the greatest care should be taken not to make same too violent, and certainly not inharmonious.

As for *style* of execution, I consider it should be to a great extent governed by the subject under treatment, as it should aid considerably in expressing character. Thus, in a man, it should be bold and vigorous, while in a woman delicate and tender.

In laying colours, one should rub as little as possible with the brush, and thus aid in keeping them bright and fresh.

In all work avoid harshness; no line should be left unsoftened. It will be found that in nature there are no real outlines, although the boundary of sight seems to be distinctly marked.

All cast shadows should be painted of one tone and of as *warm* a hue as possible, except at the edges, where, as I said before, they must be greyish. The local tint, whatever it may be, must naturally influence the carrying out of this arrangement.

Reflective lights, too, should be kept warm, except in cases where the object from which they are thrown is visible, in which case they must partake of its especial colour.

In cases where the outline of a figure may be *ungraceful*, and for some reason it may not be advisable to alter the drawing of it, it should be judiciously lost, as it were, in the shadow of background to such an extent as may render it no longer offensive to the eye.

The massing together of lights and shadows will result in breadth and grandeur of effect. In this the background will aid considerably when managed by skilful hands.

All shadows should be kept as transparent as possible, never heavy and opaque.

The purer and more transparent colours are kept the better. They should be most truthful to the subject, and be in general harmony, not only with each other, but with the general tone and nature of the picture.

One of the most essential qualities of a background is that it should *retire* from the figure, and should not seem to *rest upon its shoulders*, and the figure, in turn, must not seem to be as it were cut out and laid on. In other words, we must try to produce atmosphere.

We should be unceasing in our efforts to preserve *breadth* of light and shade in our pictures. This quality is absolutely essential to success, as, without it, no matter how careful our manipulation may be or how elaborate the general finish, our picture will be without any real merit.

As regards the *likeness*, constant reference to the duplicate photograph when the sitter is not at our disposal will be sufficient help in this respect. A picture in which all these qualities are carefully and consistently carried out will possess no little value as a work of *merit*, if not quite a work of art.

REDMOND BARRETT.

ON A NEW PRINCIPLE FOR THE CONSTRUCTION OF PHYSICAL INSTRUMENTS OF QUANTITATIVE MEASUREMENT.

II.

For six months, after inventing the chain and other arrangements described in my last article, and by means of which I have been enabled to convert the Cartesian diver into an instrument for the measurement of pressures at constant temperatures, I felt quite convinced that its compensation for temperature was impossible. As the temperature of a gas increases, so does its tension, and that directly if our temperatures are counted from the rational zero of -273°C. , and to compensate the Cartesian pressure indicator for variations in temperature requires that for each degree of temperature to which it is subjected a corresponding fraction of pressure to the air contained within the diver must somehow be applied. During the six months in which I had this problem of a possible compensator engrossing my attention, I had the jar with the balloon and chain in use as a barometer. The jar was open and carefully kept filled to a certain

point, and a thermometer was affixed inside. By means of tables, showing the tension of airs and vapours at different temperatures, I was able to deduce the barometric variations of the outer air, and found the instrument to work extremely well and to be altogether

more sensitive than either the mercurial or the aneroid barometers. Daylight, however, dawned on me at last. The containing vessel must be in reality a thermometer, and force up a liquid column in such a way as to produce the increase of pressure needed with increasing temperatures, and I produced an arrangement of the kind depicted here. A tube suitably proportioned to the capacity of the jar was secured in firmly by an indiarubber "cork," the whole thing being completely filled with water at the highest temperature to which it would have to be exposed, and a drop or two of sperm oil floated on the surface to prevent evaporation. In this arrangement, as the temperature of the liquid in the jar diminished, so did the temperature of the air and vapour in the balloon and their tension with them, and in an arrangement properly proportioned the liquid column descended, and so far diminished the superincumbent pressure as to leave the balloon in the same position of elevation as it was in before the reduction of the temperature. In fact it was sensible to the barometric variations only, and uninfluenced by the temperature of the jar. The form and proportions of the thing were not to be desired. Whatever the capacity of the jar might be, the tube would require to have one definite length above it to compensate for a definite range of temperature.

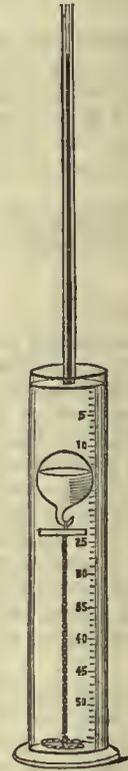


Fig. 1.

To give a concrete example. Suppose water to be the liquid used, and the range of temperature to be from 50° to 90° Fahr., the tension of the mixture of air and aqueous vapour would equal a column of mercury 3.448 inches high, and would necessitate an aqueous column for its regulation of that number $\times 13.59$, the specific gravity of mercury $\times 1.0045 \div 1.0008$ for the diminished specific gravity of the waters between the temperatures named, or, say, 48.9 inches in all, which on the top of a jar one foot high (having a reading space of nine clear inches for three nominal inches of the mercurial scale) would leave us with an instrument over five feet high. To obviate this height I resorted next to the use of a mercurial compensator as depicted

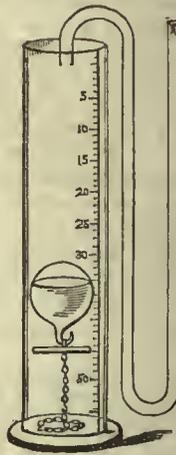


Fig. 2.

in Fig. 2, and the original instrument is in my possession now. In this arrangement, as the mercury descends in one limb whilst it rises in the other, the actual linear movement in the tube required to produce a vertical pressure of 3.448 inches is but half that quantity, or 1.724 inches.

Accordingly, with a mercurial compensator, the Cartesian barometer may be so reduced in size that the reading space may occupy three-fourths of the length of the whole instrument, and this in the instance of one a yard in height—about the length of most mercurial barometers—would afford spaces of nine inches each as representative of the nominal inch of the mercurial scale.

In my next I propose to give another variation of the Winstanley Cartesian manometer, in which philosophical value is coupled with something of artistic form, and that in such a way as to make the apparatus readily available

for conversion into, or for the foundation of, a perfect crowd of physical instruments of quantitative measurement.

I predict for the Winstanley Cartesian principle a place of usefulness which will never die, but to which the now living partner in its production will be indebted for the bitterest of all possible combinations of bitterness—for a premature death, and for something hideously suggestive of a martyr's grave.

D. WINSTANLEY.

THE IRIS DIAPHRAGM.

In a recent reply to a correspondent it is said that "the iris diaphragm is about as good as any other." As I have this summer been using some lenses fitted with this diaphragm, I hope you will allow me to say that I think it has points which may well cause it to be preferred to "any other."

In the first place, there is no fear of either losing the diaphragms, mislaying them, or leaving them at home. All these misfortunes have happened to me with Waterhouse diaphragms. I remember once spending a couple of hours on Little Orme's Head in a fruitless search for a favourite diaphragm ($\frac{f}{2}$) which had dropped out of its slit as I was carrying the camera on my shoulder; intending to employ this stop only I had brought no others.

Then with the "iris" there is no slit in the lens tube to weaken it, and—worst of all—to admit light. The nuisance of fixing indiarubber bands, tying on handkerchiefs, &c., to exclude this light, must have been experienced by every one who uses the ordinary "stops."

In focussing, it is a great convenience to change, in a moment, from full aperture to any opening required, or *vice versa*, by the simple revolving of the "iris" ring. There is no bother of changing or fitting in stops.

Another advantage is that almost any aperture may be obtained, intermediate between those marked upon the mount, by previously measuring the size of the opening. This is often useful when it is desired to compare lenses, &c., which, perhaps, have not similar stops.

Lastly, the "iris" is lighter, more compact and self-contained, and is free from risk of bending or breaking.

The "iris" diaphragm was introduced, for microscopic work, by Messrs. Beck, I believe fully thirty years ago. But it may be said to have been employed in photography also during that period, for the objectives so fitted were used for photo-micrographic purposes by some of our best workers.

Attempts were also made at intervals to introduce the "iris" diaphragm into ordinary photographic lenses. Thus, in a volume of THE BRITISH JOURNAL OF PHOTOGRAPHY,* which I happened to be looking over this morning, I see that at a meeting of the North London Photographic Association, Mr. How, of Foster-lane, exhibited a lens-mounting which is thus described:—

"In the place where the diaphragms (*à la* Waterhouse) are usually inserted was a lever, on moving which to one side the diaphragm in the tube was made to contract. When the lever was at one side the diaphragm was at its largest, when at the other side it was contracted. This was effected by the diaphragm consisting of a number of pieces (each one hinged on a separate pin) placed on a disc, all inside the tube. By means of a volute curve, or some similar contrivance, the motion of the lever caused the free ends of these pieces to move in the direction of the centre of the tube, and, as all moved simultaneously, the aperture in the diaphragm plate was correspondingly diminished. Although in the particular lens exhibited there was no index by which the exact aperture could be ascertained, yet Mr. How explained that in the other lenses which were in his possession that had been provided for.

"The Chairman (Mr. W. Hislop) said that, looking at the lens in a mechanical point of view, it was a very efficient form of diaphragm, occupying a small space. In using the ordinary diaphragms it was not pleasant to drop one through a chink of a rock and have to extemporise a cardboard substitute. The present arrangement would obviate that, and it seemed to be as perfect an one as they had ever had brought before them."

For some years past Messrs. Beck have extended to their photographic lenses the "iris" system, which they originally applied to microscopic objectives; and I feel sure that those who have once experienced the "comfort" of this plan will desire that all other opticians should follow their example. W. JEROME HARRISON.

A DEFENCE OF THE AREA SYSTEM.

SCIENCE simply means knowledge, but is generally used in the sense of perfect knowledge, or rather what is accepted as such. It is not, however, a fact that we have a perfect knowledge of any branch of "science." Many of the laws deduced by scientists from the facts known, imagined, or even invented, are, and probably ever will be, subject to change as we progress towards more perfect knowledge. The highest professors of many branches, probably of all, differ from one another as to the laws as well as the facts. Science, for instance, has done wonders for the manufacture of iron and steel, particularly the latter; but something must be wrong in the application of it when the unlettered men of the Soudan had infinitely better weapons, as far

* See number for February 24, 1865, page 103.

as regards quality of the steel, than our troops. As a matter of fact, everybody cannot be right when many disagree, and, as a matter of opinion, there are not many laws yet established that may not some day be proved false.

There is only one book in the whole literature of the world in which no one yet has found a flaw—*Euclid*, which is a pure type of reasoning, not logic, which I take to be a system of hair-splitting as generally practised. Every premiss is first carefully stated, and, if agreed to, all the rest is so clearly stated, step by step, that flaw finding is impossible. In ordinary science it is quite otherwise—a *dictum* of one man is often accepted as fact. If it prove fallacious, what becomes of the theories and laws based upon it? The moral is never to take anything in print for granted, but, if the subject matter interests you, try for yourself and see if it agrees with your own experience.

If there is one thing upon which everyday practice agrees with science teachings, it is in certain properties of lenses. It is to those that I now wish to call attention. The properties that are not disputed I believe to be these—that if a given stop with a given lens requires an exposure of one second, then a stop of half the diameter would necessitate four times the exposure, and one of one-third the diameter nine times the exposure. That if a given stop with a given lens requires an exposure of one second, then if a lens of double the focus were employed with that stop four times the exposure would be necessary, and if one of three times the focus a ninefold exposure is required—approximately.

If this is admitted, it necessarily follows that a system based on their areas in some form or other is desirable, if only as a ready way of ascertaining the relative exposures that would be optically equivalent with the many varieties of lenses and diaphragms in general use, as affording a more ready and easy way of comparing results obtained.

First of all, the focus of the lens must be found, as, according to the modern system, the sizes of the stops depend upon this being known more or less accurately. In those happy, early days, before science came to the attack (or shall I call it rescue?), a good deal of good work was done with very simple appliances; a single lens, often not even achromatised, was most generally used, and, as a matter of fact, it was measured and described by its *back focus*—that is, by the distance it was from the convex side of the lens to the plate. And a very good arrangement it was, for, by good luck, it happened to be nearly scientifically correct as well as practical. This got to be such a habit with the majority of us poor common folk, that the scientific opticians who catered for us were obliged to give the *back focus* as well as the equivalent focus of their doublets before we could understand how to make use of them. We persevered, however, and tried to learn the proper meaning of equivalent focus, and to get at the reason why a lens was called a six or a ten-inch equivalent focus. Slowly and painfully it dawned upon us that although we could not measure it and make it agree with its supposed focal length, it was probably quite right. We also had a hard struggle to find out the value of the stops employed in these doublets, which were mysteriously placed, sometimes in front, sometimes between, and sometimes behind. Then our difficulties were in no way lessened by the announcement, by the great high priest of photographic lenses, that the value of the stop when placed between the lenses was materially affected by the increase of effective aperture occasioned by the convergence of the light rays by their passage through the front lens of the combination. We passed through a further vale of agony when it was discovered that the increased number of reflecting surfaces had also to be taken into consideration and allowed for. Practically, I do not think we any of us bothered ourselves any more about the matter. A large number pinned their faith to the high priest and gave him all the credit he deserved, other priests arose and following them or the glorious old-fashioned rule of thumb, the remainder jogged along their own way; all, or, at any rate, most, doing excellent work, but without being able to communicate scientifically how they did it, thus fully corroborating the old adage that "an ounce of practice is worth a pound of theory."

Still there was a widespread feeling that some definite system should be established, and a Committee was appointed by the Photographic Society of Great Britain to settle the whole question. It was duly considered and decided that, as the exposure depended upon the proportion which the diameter of the stop bore to the focus of the lens, the unit of stop should be made one-fourth the focus of any lens, on the supposition that that was the largest aperture available. This was evidently an error of judgment, for the most rapid lens at that time worked with a very much larger aperture, the focus of Dallmeyer's 2c lens being of six inches focus, working with a full aperture of two and three-quarter inches, as much larger than the unit settled by the Photographic Society as 1000 is greater than 375.

That this was an unfortunate beginning of a settlement is self-evident, from the fact that Dallmeyer did not adopt it. As a matter of fact, out of sixty lenses which he catalogues, and which are supplied as the very best that can be made, each necessarily being fitted with the most suitable stops, there is only one in which the stops are calculated on the basis proposed and decided upon by the Photographic Society. He not only did not adopt it, but his son and successor has not adopted it either, but has continued on the old lines, with another plan of his own, not one whit less scientific or, I may add, impracticable. Curiously enough, though in most cases exact inches, occasionally quarter and half inches, are quoted for the focus of the lenses, the diameters of the stops are measured to the thousandth of an inch, possibly because the exact equivalent focus of the lens is not of such vital importance after all. If it be, think of the labour involved in correcting the stops to the tabulated accuracy. They already require six places of decimals, that is, seven figures, to show their rapidity by the Photographic Society's standard.

Although not a member of that Society, I ventured to point out that the practical plan would be to establish a definite unit by which all stops could be measured and made. That then the stops bearing definite numbers would have their relative exposure values with any lens, as soon as that lens's focus was ascertained. I was not at that time prepared to do more than suggest the unit, but I am more than ever convinced that the unit which I have adopted for my area system is the only one practicable or possible. It is the unit of one-sixty-fourth of an inch.

The reason that this is the only one possible is that all mechanical drills are made to that size, and that size only. The number of the drill is always, as exactly as may be, the diameter of the hole it drills in sixty-fourths of an inch.

If it be objected that the metric system is or may be also employed, I reply that that makes no appreciable difference whatever, for if the measure be taken in tenths of millimetres, four such units are so near to one sixty-fourth of an inch that the error is only 19 in 2500, an amount of error that would be practically inappreciable as well as inevitable by any system of measurement.

My system applies, first of all, and most important of all, to the stops. It is highly important that every one shall be able at once to verify the size of his stops easily and with fair accuracy, while it would be equally desirable for him to be able to verify the exact focus of his lens; but, as will be seen, that is a very different matter when it comes to the test of practice. Theoretically and scientifically it is all *abc*.

Technical education is the cry of the day; but here, again, the theorists are at loggerheads, with but scant hope of a speedy solution of the problem of how to apply it so that it may be of practical use. For myself I admit the value of both, provided that theory agrees with practice. When it does not—as, for instance, the geniuses who lecture on modern chromatics delight to boast—so much the worse for theory. A little knowledge is a dangerous thing; certainly theories are dangerous unless supported by practice.

Science is a grand-sounding name, and employs big-sounding names to express itself, but it has still much more to do before it will be exact or beyond suspicion of error. The greatest professor best knows his own ignorance. Still, I hope we all work on trying to know, and are therefore science students.

A perfect lens is still a *desideratum* at which hundreds of willing hands and brains are working, and many hope that photography will benefit by the improvements that will be made. In some respects these hopes may be realised, but there is very little probability of their in any way revolutionising the ordinary practice of photography, for it will never give them lenses that will take landscapes with a large aperture, or in any material way alter the conditions under which we work now. With the most perfect lens imaginable there would be, to all intents and purposes, precisely the same necessity for stopping down when occasion requires, and therefore all the more necessity for some clearly understood and easily practicable method of measuring and marking photographic lenses and diaphragms. I, therefore, particularly conjure even those who are content to let things stay as they are, who are quite satisfied that their lenses do all they want more or less to their satisfaction, to give a thought to the future, and try if we cannot decide upon a system on which they had better be marked.

Now the question of getting the focus of the lens is just the one which is so very simple from a scientific point of view but so very difficult from the practical point of view.

The principal focus is always assumed when a scientific article is treating of a lens, but practically—even by opticians—it is so rarely that I feel I may almost say it is never actually used. If it is ascertained, it is invariably most roughly stated in quoting telescopes,

microscopes, and photographic lenses. There must be some reason for this to outweigh the craze of the times for *science*, and it is simply that, except in the case of telescopes, lenses never work at their actual principal focus, and that even in these it has not, so far, been found necessary to specify it.

For photographic purposes, ordinary telescopes, opera-glasses, and many other purposes for which lenses are used, if I am credibly informed, the manufacturer's plan is simply to try them, and, if measured at all, it is simply a moderately distant object that is chosen, and the *focus* is taken as the distance from the cell in which the lens is placed for examination to the focussing screen. He can, of course, if he likes, and if occasion demand it, establish it more accurately, but, as a matter of fact, as he has also to make the mount to suit his lens, it is this practical measurement, rather than the scientific optical centre, that he requires. But, at the best, it is a somewhat elaborate calculation or experiment, and one quite unsuited to the *go* of modern times.

I was taken to task at the meeting of the North London Photographic Society for the reason that, in my paper on the area system I gave it as a practical solution to the problem what exposure to give to two combined lenses of which the several exposure value was known, as, add together and divide by eight, on the plea that this was not scientific, and liable to error amounting to 100 per cent. I grant that from the point of view of the pseudo-science teacher who trusts to theory rather than practice (and neglects the *abc* even of his science, as was done in this case), my plan was anything but scientifically accurate.

I was perfectly well aware of Mr. Traill Taylor's excellent formula, though I do not pledge myself that it is scientifically correct. It looks right, and has the splendid merit of being apparently delightfully simple. You have only to know *a* and *b*, which are the foci of the two separate component lenses intended to join together, find *c*, which is the distance they are apart in the mount, and then *d*, the combined focus, comes out of itself almost like magic. The real difficulty—fully appreciated only by experts—is just this finding *c*, which is the sum of the two possible errors of *a* and *b*, while if *c* is neglected altogether, as was blandly admitted, it vitiates the scientific theory absolutely and completely. As a matter of fact, this pseudo-scientific craze may be carried too far. It has not hitherto been found either necessary or practicable, while the practical means of approximate measurement are well known to those who want to know. As a further matter of fact, I made many scores of practical tests of various combinations, and worked them out by all kinds of formulæ which never really agreed, while I found that my rough-and-ready plan was eminently suitable for everyday use, and practically did not in any case exceed an error of ten per cent. Happy the man who can judge his exposure to that degree of certainty. However, this is no fault of the area system—which is quite capable of yielding the highest possible degree of accuracy that may be considered necessary or desirable—but my fault, if fault it be, for not giving a scientific conundrum to be worked out instead of a practical rule which I have tested and proved as fairly accurate.

I, therefore, once more bring the area system before the photographic public, believing that it will be for their own interests—I have none whatever in it myself except that of a fond parent.

GEORGE SMITH.

ON THE FADING OF SILVER PHOTOGRAPHS.

II.

It has been alleged that ozone exercises an active influence on the fading of silver prints. It appears to me that this idea must have been hastily deduced from the fact that such pictures are more liable to fade during the prevalence of thunderstorms and continued wet weather, or when they are exposed in places near the sea. These certainly are the conditions under which ozone is most abundantly found in the atmosphere; but it remains to be proved that this gas is the predisposing cause. I have, however, made an attempt to solve the question.

Ozone has been very aptly defined as three volumes of oxygen condensed into two. It is naturally formed in various ways during slow oxidations, for instance, those of ether, turpentine, benzene, &c., by violent action on water where it is beaten into spray; by electricity discharged through atmospheric air or dry oxygen. Indeed, during a thunderstorm and by the seaside, when the waves are breaking on the beach, it often manifests its presence by its peculiar smell. From its tendency to part with a volume of its oxygen it is a powerful oxidising agent, and possesses considerable bleaching properties. It oxidises silver, but not gold or platinum. Hence, two of the prints which I subjected to its action were untuned, so that I might the

more correctly note the change, if any, that occurred. The following plan of testing was adopted.

The halves of two freshly prepared silver prints (untuned), one on plain and the other on albumenised paper (No. 1), also the halves of two similar prints (gold toned), badly faded (No. 2), were enclosed in a box and subjected for eleven days to the continued action of ozone, generated by means of the slow oxidation of phosphorus. These prints were examined daily and a fresh dose of ozone liberated on them for about two hours. At the end of that time the freshly prepared prints had not suffered the least damage, while, to my surprise, the yellowish and partially faded ones were greatly improved in appearance. Not that the image itself appeared to be altered, but the yellowness had almost entirely disappeared. The texture of the paper, however, seemed to have suffered considerably, and the prints required careful handling. Presumably, the ozone had oxidised the sulphurous compound into a sulphate.

This solitary experiment must not be considered by any means conclusive, but, on mentioning the results of it to a picture restorer, he observed, "Why, that's nothing new, for it's the plan we use for restoring old etchings and engravings, and has been in use for years by those who are in the secret."

It may possibly be that some day we may find out that this same ozone may turn out to be the photographer's friend instead of his foe, if we could only find out the best means of utilising its peculiar properties.

GEORGE DAWSON, M.A., PH.D.

P.S.—Having, Quixotic-like, attempted to demolish this ozonic windmill in mistake for a giant, I shall endeavour, in my next communication, to point out real dangers and the best means of avoiding them or, at least, mitigating the effects of those that must necessarily be encountered, and which affect the stability of silver prints.

THE PHOTOGRAPHIC SOCIETY OF INDIA.

WHEN an amateur photographer has mastered his art in all its technicalities, it becomes a question of "What will he do with it?" His taking up photography, *ipso facto*, presumes that he has taste, but taste alone will not supply those principles of picture making an artist has to acquire by study. The cultivation of the art faculty is of primary importance, it gives the hall mark to his production. The closely following of the art literature of the day, and a current interest in art matters, will always prove an incentive to a higher order of work in photography. Hamerton's *Portfolio*, for instance, goes a long way to expound the ethics of art. The study of etching will prove of particular value to the photographer, who should emulate the velvety masses of shadows in all good examples.

Etchers are careful in the printing of their plates, whose artistic qualities are personal equation with the artistic ability of the printer. Photographic printers consider a negative good if it prints rapidly and with little or no attention.

There are instances of coppers being sold at a fraction of their value, because they were supposed to have been worn out. In the hands of artistic printers, their printing value was proved to be considerably greater than even originally imagined by the artist. Hayden's etching of the *Breaking up of the Agamemnon* was almost discarded by himself. Altogether it fetched him a sum of 2500 guineas, or three guineas a minute for the time spent on his work.

The Ialmagundi Club of New York, to take one of many examples, may read us a valuable lesson as photographers. A subject is announced by the presiding member, and each artist is supposed to embody it in artistic form. The results, on a particular evening, are produced for mutual, but not necessarily complimentary, criticism. On the particular occasion referred to, the subject was Silence, and in the *Scribner* of January, 1880, will be found illustrations of works produced in paper and canvas and in clay; these essays are worth studying for the impetus they give to artistic feeling.

Photography may make similar essays. The artist has for his model the human figure—the purpose he supplies—his photographic brother may do the same.

In art, one of the first secrets of success is simplicity, and simplicity waits upon sacrifice. Art is less than nature, and its best examples leaves something to suggestion. Photography, on the other hand, is emphatic everywhere. In its best examples, a subject may be so arranged and lighted that what is begun positively is carried by suggestion through undertones to shadow, contrast being followed up by association.

The purposes for which photography may be specialised are unlimited. But if one class of subject be sought at every opportunity, without ignoring the range outside his speciality, the amateur photographer will make for himself a purpose whose ultimate value he has no present means of gauging.

To enumerate a few directions in which he may seek to excel, the following may be mentioned. Each capable of endless sub-division:—Scientific Research, Human Nature, Ethnology, Animal Sociology, Landscape, Architecture and Archæology, Still Life, The Social Circle.

A comparison between the artist and photographer at work will be useful. The former is most frequently a nervous worker. The latter must be a deliberate one. Each must seize an opportunity in his own way.

If then, to begin with, the photographer will bear in mind some of the maxims of the artist, his purpose would be the better upheld by a certain emphasis in his pictures.

Simplicity and sacrifice have already been mentioned.

To make everything in a picture equally important, is to make it utterly feeble. The artist has the power of elision. The photographer has to provide a compromise. Suggestion is the art of compromise. A part doing duty for the whole.

Contrast gives emphasis, it has also to do with lines or forms crossing each other. It is strongest in the right angle and wanting in parallel lines.

Important points in a sky line should be carefully studied, outlines standing clear of each other, and not running in nearly contiguous lines. These repetitions enfeeble a picture. Compare the pulsating effect of a papered wall when the light on it is concentrated to a particular area, and the rest more or less in comparative shadow. With the same subject, in open daylight, you have simply a pattern.

Balance should govern masses and keep them within the precincts of harmony. It regulates proportion, which, in its turn, lends itself to beauty.

The faculty of placing an artistic mean between two or more existing elements, constitutes much of the art sense of the artist.

Figures or objects placed at the cardinal points of a picture—said to be the thirds, fifths, and sevenths—acquire emphasis.

Of light and shade, it would be impossible to speak within the scope of a paper like this, but a contrasted instance may go some way in explaining extremes.

A single portrait subject under a bright sky. A photograph taken without any attempt to regulate the light will be flat and insipid.

Take, again, the same sky and the same sitter, but interpose between them a translucent material like sheeting with an oval opening near the face, continued on the lower side by a lunette of muslin. The stronger beam of light coming through the opening is followed by a feeble light coming through the finer textured muslin, while the diffused light of the whole sheet supports this.

The intenser light is so directed on the face that it shall focus over the nearer eyebrow. We now have the device adopted by all the leading painters, but more emphatically by Murillo and Valasquez; Rembrandt, Rubens, and Vandyk.

Between the two extremes cited there is an infinite variety. In dealing with the lighting of a subject, let but intention exist and its success will be the index of its fulfilment.

The last element I shall speak of is mystery. The undefined but unmistakable atmosphere which enfolds the indescribable entanglement of mingling textures fill one with a sense of mystery. The artist who would paint the moods of nature must penetrate its secret.

The photographer may revel in this depicting of mystery if he but understand it and feel its presence.

My last word will be the master-key of all art canons—the one grain of salt with all the dry pabulum. You will forgive its triteness and its want of novelty—"Art it is that Art conceals."

S. E. CADDY.

DRYING THE BALAGNY FILMS.

THE Balagny films are so popular in Paris because they have no grain, require no oiling when finished, and are worked like ordinary dry plates, except that they must in all cases be alumed and afterwards dried by alcohol. Much about their manipulation has been published by M. Balagny, who makes them by a semi-secret process. It is not impossible that they consist of a layer of emulsion, followed by a layer of regulated thickness of tough collodion, followed again by a second layer of the same emulsion. The collodion in the middle might prevent their expansion in aqueous liquids, whilst the emulsion on both sides of the collodion might prevent their curling when wetted, the tension on both sides of the collodion being then equal. Possibly, also, they may consist of a layer of emulsion between two films of porous collodion. They appear to have been stripped from glass plates, one side of the film having a better surface than the other. Here is

what M. Balagny says in *Le Moniteur de la Photographie* about the final drying of negatives upon his films:—

After they are taken out of the washing waters, in which they should be left at least two or three hours, during which the water is changed five or six times, they are placed in thick blotting-paper to remove all moisture possible; then they are placed, image side downwards, in the following bath:—

Strong alcohol	500 c. c.
Glycerine	50 „

In a new bath, that is to say in one in which at least twenty proofs have not been immersed, the proofs should not be allowed to remain more than three or four minutes at the outside; the surface of the film tends to adhere firmly to the bottom of the bath, but when the bath solution is old it is much better for working purposes, and then the negatives may remain in it for at least ten minutes.

When the bath solution decreases, more alcohol, containing ten per cent. of glycerine, is added, to comply with the terms of the foregoing formula. It is necessary that the bath should have a specific gravity of about 75° at most, because a strong alcohol bath has a more powerful drying effect than a weak one, which will act more slowly. A porcelain or glass dish should be used to hold the alcoholic mixture.

The negatives are taken from the bath one by one and laid upon each other, image side downwards, upon a large sheet of glass; one negative should project over the end of the other to the extent of half a centimetre. The last one is to be covered with a sheet of indiarubber, then, with a gelatine roller, all the proofs are rolled and pressed, to squeeze out the liquid as much as possible. The indiarubber sheet is then raised and replaced by a sheet of blotting-paper, the roller is passed over it, and the uppermost film still further dried; to dry it more completely, take it up by a corner and place it between two dry sheets of thick blotting-paper, over which the roller is then again passed. In rolling the negatives a truly flat surface is requisite for their support; a table, a sheet of glass, or the top of a marble mantelpiece will answer the purpose. This first negative is left in its blotting-paper covering, then all the other negatives are treated in turn in the same way, until a collection is acquired of all the films between leaves of blotting-paper. They are then left to finally dry in a quantity of thick blotting-paper, in which their position is frequently changed, so that they shall not rest too long between two damp sheets.

When they do not feel damp when touched they may be said to be dry; they then have to be flattened out, which is done by placing them for a time between the leaves of an album of thick dry blotting-paper. Afterwards they are stored in a box. If in the course of these drying operations the back of the film loses some of its brilliancy of surface, the dullness can be entirely removed by means of a little absolute alcohol, which will restore its polish and give the film a good appearance.

Such are M. Balagny's instructions. Probably such films might be rendered waterproof by the solution of gold size recommended for varnishing negatives by Mr. W. M. Ashman, but it is necessary that the gold size should be pure and not contain the common adulteration of resin; in the latter case the film will be tacky. If this varnish be made with too large a proportion of gold size, it will also be tacky. Balloon manufacturers usually make their own gold size for varnishing the balloon, to guard against the carelessness of makers who turn it out in the way of trade to be used for less delicate purposes. Some weeks ago the *English Mechanic* gave detailed instructions how to boil down linseed oil so that it shall be fit for varnishing balloons. The gelatine roller mentioned by M. Balagny is doubtless of the kind in common use by letterpress printers.

RECOLLECTIONS OF EARLY DAYS IN PHOTOGRAPHY.

[This is a new and revised version of the *Recollections of Early Days in Photography* by our much-esteemed veteran friend Mr. J. Solomon now residing in New York, sent to us by the author. They were originally written for a contemporary in New York in which they appeared. The errors in the original edition have been carefully eliminated.—Ed.]

INTRODUCTION.

THE discovery of fixing shadows is another advance in scientific knowledge obtained by men of the nineteenth century. It had been observed, even as early as in the days of the Ptolemies, that if a hole or small crevice occurred in the wall facing a landscape or seashore, when the closet was closed and dark, the light penetrated the hole or crack, and the shadow from without was reflected upside down on the wall, opposite to the opening in the wall. Alchemists had observed that such images could be impressed on sheets impregnated by certain salts of silver on which light exercised a darkening influence. The power of steam had also been observed, and a small toy was made, in those ancient days, showing its power. The magnetic attraction of amber, too, was observed, and it was called electron, from which

originated the term electricity. Yet, from these ancient times to the seventeenth century, no advance or application of these powerful forces in nature for the use of mankind were put into effect. Now the dark clouds which obscured the light of freedom from the middle ages are passing away, and we are nearing the threshold of great results for the general welfare of mankind.

RECOLLECTIONS.

In the summer of 1839, all Paris was excited on hearing that one of the greatest discoveries ever made by man was made by a Frenchman. M. Arago, the great astronomer, informed his fellow academicians that the report was a fact, having been made certain by being admitted into the secret by the discoverer, M. Daguerre, the well-known artist in scenic, dioramic, and panoramic pictures. The great discovery was, that the sun's shadows, as they were seen on the screen of a camera obscura, could be fixed on a surface and handled the same as a picture made by hand in the ordinary way. Another member of the Academy recommended that, for the honour of France, the secret should be purchased by the Government and given to the world. The king, Louis Philippe, supported the proposition, and M. Daguerre was made an officer of the Legion of Honour, and well paid for his discovery.

Either about the same time, or shortly after the negotiation for the purchase of his secret, he went to England, and from the aid given him in London by a Frenchman named Claudet was enabled to obtain an English patent.

The English patent was placed in the hands of an agent to sell, and, although the French Government purchased the secret to give to the world, the English patent debarred the gift to the English nation. But it was found that others were in the field besides M. Daguerre, searching to fix the shadows as seen through a camera obscura, and the Government, I believe, gave a pension to both Daguerre and to Isidore Niepce; continuing its favours to Niepce de St. Victor, a nephew of M. Niepce, who was in the army, but, in his leisure, pursuing the researches of his uncle. He was granted a suite of rooms in the Palace of the Luxembourg, to continue his researches on fixing the colours in the images. I have seen one of these pictures, which was a large bird, with brilliant, various coloured feathers. The picture was on silver plate, about whole size (6½ × 8½ inches), and the colours, although true, were not pleasing, from having a Dutch metal, dazzling effect; and also, it was only to be seen in a darkened room by the light of a small candle. It was rumoured that Daguerre had made with the elder Niepce a tacit agreement that each should inform the other of any progress or discovery, and that they should share in the success if the object sought to be obtained was gained, but that Daguerre, who had received many hints from Niepce's studies, had not informed Niepce of his discovery. No doubt this rumour was a libel on Daguerre.

After Daguerre obtained his patent in England, he gave a written authority to Mr. Claudet to take pictures in London, without requiring any permission from the purchaser of the patent; and when portraiture was obtained on silvered plates, the purchaser of the patent, Henry Beard, a coal merchant, opened a studio in the Polytechnic Exhibition Building, at the top end of Regent-street, and Mr. Claudet opened a studio in the corner building, at the bottom of Regent-street. Beard gained more than 100,000*l.* from his purchase of the patent, and at the same time Niepce and Daguerre were pursuing their researches to obtain the coloured images as seen in the camera obscura. Others, in different countries, were searching to obtain the means of fixing them, and amongst them was Mr. Fox Talbot, a descendant of an English noble family. He was a member of the Royal Society, and discovered the means of fixing the shadows on paper, and he was probably the first who obtained copies printed from the first picture taken. Mr. Talbot also patented his discovery, and the honourable position of Mr. Talbot as member of the Royal Society caused many sneers and reproaches towards him, and the public considered that he should have freely given it to the English people, as he was rich in means and high in descent.

About the year 1840, I purchased, in company with my brother-in-law, a portrait artist and a painter of landscapes, a set of Daguerreotype apparatus from a well-known large artists' colour store, then in the Rue Coque St. Honoré, which street does no longer exist in Paris. We set out to follow, as near as possible, the written published methods to obtain a picture, but failed. I remember that to obtain the vapour of iodine on the silver plate, either before the mercury was on it or after, I placed the iodine in a small dish in the corner of a room, and held the plate over it for a very tiresome time and obtained nothing but smudges instead of pictures; so I abandoned the whole thing. The two first pictures shown to the general public was from the store of Susse Frères, the noted artistic store in the Place de la Bourse, and these two were pictures of the same object—

a row of houses; and I think the pictures were on plates about 7 x 4 or 5. The pictures were taken from the same spot, and every brick, stone, crack, &c., appearing so microscopically exact, the lookers-on were filled with astonishment. Prophets foretold that artists in landscape pictures would be no longer required; but Daguerre expressed his opinion that the invention would never be useful for portraiture on account of the time required—fifteen or more minutes—to obtain a picture. The lens employed was a simple achromatic meniscus; but some time afterwards, Buron, the largest optical manufacturer in Paris, produced a double combination lens for obtaining quicker results. From that time attempts for obtaining portraiture began.

I was an inhabitant of Paris for some years and then went to London to obtain orders for French manufactured articles, particularly opera glasses, and represented the manufacturer of superior opera glasses in Paris. Palmer, a druggist, who also kept a furniture store and articles of science in Newgate-street, London, gave me orders for various articles, amongst which was a quarter portrait lens, and I remember the consternation I had. One of the assistants in unscrewing and re-screwing had changed the lenses, but the next day the error was discovered.

Amongst the sundries was a bottle containing six or eight pounds of the new chemical, hyposulphite of soda. I found the manufacturer and purchased four kilos, a little over eight pounds English. I did not know the exact price, but Palmer's people had given me the liberty to pay whatever the French chemist charged. They would pay, if even beyond the English manufacturers' price in England, so I quite fulfilled their order on all they wished me to purchase for them, and I left France for England about three months after. When I arrived in London I paid duty on what I brought with me, and charged Palmer eight shillings per pound for the hypo. They then made a grand fuss and reduced their retail price to what the wholesale manufacturers were charging for it wholesale. Then the article began to find its use in the manufacture of paper, and Newcastle-on-Tyne manufacturers made it in tons, so that it was sold retail for ten shillings per barrel of 100 pounds weight.

The making of Daguerreotype portraits was an extensive occupation for many, and Henry Beard having speculated away all his immense gains, had no means of renewing the last payment of 100% on the patent, so it fell into the public's hands, and thousands of people commenced taking Daguerreotype pictures. The requirements in materials was very varied, and some very expensive, such as deep glass dishes, two of which were in one box, shut out from all light, on the top of which the portrait was placed to receive the iodine and the other fumes. Small doors at the side with looking-glass were opened to obtain a glimpse from the top of what was going on. The Daguerreotype plate in England was manufactured by a company called the Soho Plate Company, Birmingham, and in Paris a firm commenced to manufacture the plate, and erected steam and rolling mills. The name of the firm was Alexis Gaudin & Co., and they also commenced manufacturing every requisite required in the art, and although the duty in England was twenty-five per cent., and other expenses of transit, &c., nearly ten per cent. extra, yet the French house could pay the duty and expenses and quite undersell the English manufacturers.

On my journeys between France and England, the noted optician, Andrew Ross, and his son, used to request me to bring them specimens of the then advanced position of photography on paper, and for a picture on paper about the size of the album portrait I obtained from this firm ten shillings, being very careful only to fulfil such orders for houses of eminence, because Talbot pursued by law any one infringing his patent. Amongst other photographers in Paris, an artistic designer for lithographic printing prepared a gelatine negative on glass, and one order from Willet, an optician, was to purchase a prepared gelatine glass to cost ten francs, but, of course, not being properly preserved from light, it was useless for obtaining a portrait.

J. SOLOMON.

(To be continued.)

EXHIBITION OF THE AMATEUR PHOTOGRAPHIC ASSOCIATION OF VICTORIA.

THE Fourth Annual Exhibition of this Association was opened at the Royal Society's Hall, Melbourne, on July 19. The display of exhibits was large and varied, and showed to great advantage the progress made by the Association during the last twelve months.

Among printing processes on paper, silver prints, as a matter of course, carried off the palm for numbers, but there were represented also carbon, gelatino-bromide, platinotype, and gelatino-chloride processes. Several window transparencies on gelatino-bromide, also stereoscopic and lantern transparencies on bromo-chloride plates, were shown. Stereoscopic photography is pursued by a large number of the members of the Association,

and the results which they produce create considerable interest amongst those members who have not yet taken up this delightful branch of work and also amongst the general public, the marvellous power of the stereoscope being a thing almost unknown by the "rising generation." Mr. J. Musgrove's fine set of stereoscopic transparencies, exhibited in the revolving stereoscope, together with a revolving frame of his own invention, which shows the negative, with silver and carbon prints and transparencies from the same side by side, made his table a centre of attraction each evening. Mr. E. C. Bell occupied another table, upon which he had mounted eight stereoscopes, supplied with over three hundred stereographs. Messrs. E. A. Walker and J. H. Harvey also exhibited a collection of stereoscopic slides.

A notable feature of the Exhibition was the very small quantity of instantaneous shutter work shown, only three or four members exhibiting. This may be taken as a natural consequence of the state of things which existed a few years ago, when all amateurs (save a few of the steady ones) thought that a snap shot should be taken at everything. Many have become alive to the fact that instantaneous work—of a sort—is as easy of accomplishment by the beginner as by the experienced practitioner, and have, therefore, abandoned the practice of advertising the plate makers by wonderful tales of the exceedingly short exposures by which their work was produced.

The principal instantaneous exhibit was a set of their famous yacht studies, kindly lent by Messrs. G. West & Sons, of England; these were universally admired, and formed one of the gems of the Exhibition.

The leading enlargements of portrait and landscape work shown were by Mr. J. Musgrove; these were printed in carbon, having been enlarged from stereoscopic size to about 15 x 12 inches. A set of views taken in the "Zoo" attracted much attention, being the work of Miss A. J. Cooper, the only lady member of the Association.

The chief architectural work shown was produced by Messrs. F. A. Kernot, J. Mulvany, and J. H. Harvey. Messrs. Mulvany and Kernot showed various buildings about Melbourne and suburbs; Mr. Harvey having sent in a frame containing similar interior views of the Melbourne Parliament Houses to those he showed last year, supplemented with several interiors of this stately building which he has obtained since; he also showed other whole-plate views of public buildings in various parts of the colony, together with a frame illustrating the scenery in and around Sydney.

Portrait work was poorly represented, although a few excellent specimens were shown here and there. Mr. J. Lang's landscapes, several of which were printed in platinotype, are worthy of mention. He had printed duplicates of many of them in silver, thus affording an interesting study, as the results were hung side by side. Amongst landscapes, a fine set, kindly presented to the Association by Messrs. Jas. Swift & Sons, of London, illustrated work done by lenses of their manufacturers. This firm also sent a print of the famous enlargement of the proboscis of the blow-fly, executed by Mr. M. J. Swift.

The Philadelphia Amateur Photographic Club showed a number of silver prints of all sizes, many of them being of great beauty as artistic studies as well as technically faultless.

A large collection of prints and lantern slides was sent by the Queensland Photographic Association, illustrating life and scenery in the progressive northern colony.

The lanterns of the Association, under the charge of Mr. J. H. Harvey, were located in an adjoining room, and at intervals during each evening a number of slides were exhibited, illustrated by the limelight. The photographic material-importing houses sent good assortments of novelties and interesting apparatus, which were shown in a third room.

It was generally agreed that the Exhibition was the best yet held by the Association, both by reason of the quantity and quality of the work shown.

In the competitions the awards were made as follows:—Large landscapes: 1, J. H. Mulvany; 2, J. Lang. Groups and portraits: 1, G. F. Fullarton. Architecture: 1, J. H. Harvey; 2, F. A. Kernot. Small landscapes: 1, C. Harper; 2, G. F. Fullarton; 3, J. H. Mulvany. Enlargements: 1, Jas. Musgrove.

Efforts have been made on two or three occasions to induce British Amateur Associations to forward work to the exhibitions of this Society, but have failed. American Associations which have been invited have generally responded. What's the reason?

PROFESSOR DEWAR ON LIGHT AND ITS ACTION.

I.

DURING the last Royal Institution Session, Professor Dewar delivered a considerable number of experimental lectures, in the course of which he occasionally had much to say upon light and its chemical action, which portions of his discourses are here selected and summarised.

In speaking of light as an analytical agent, he said that it is particularly prone to set up changes in organic bodies. Wollaston in early times discovered the action of light upon gum guaiacum, and it has since been found that guaiaconic acid derived from the gum is more sensitive; some

of this acid dissolved in collodion be applied to the surface of paper, and showed that by half a minute's exposure to the light from a powerful arc lamp the film became of a beautiful blue colour, as deep as the hue produced by ordinary iron blue printing processes. The chemical change set up in this complex acid by light is not yet understood, but Professor Wörter has recently discovered an organic substance, tetramethyldiamine, which is sensitive to light, and the chemical constitution of which is known. This new body is also very sensitive to the action of ozone, which turns it purple; even sulphate of copper will in a limited time turn it a rich purple colour by oxidation; after poured upon it in the presence of light turns it purple. Tetramethyldiamine is one of the coal tar colours easily acted upon by light, and is probably the first of a large series of bodies which all contain methyl, and all are likely to be sensitive to light; the presence of methyl seems in some way to be necessary to the action. In dilute solution tetramethyldiamine is quite colourless when spread upon paper; light acts less rapidly upon the paper so prepared than it does upon paper prepared with guaiaconic acid. The sample of tetramethyldiamine used by Professor Dewar had been obtained by him from Dr. Schuchardt, of Gorlitz, Germany.

In relation to recent speculations about the possible decomposition of the chemical elements, Professor Dewar said that Professor Stas, of Brussels, has by urging refinements in preparation, obtained elements of more purity than has anyone else; he has, for instance, prepared salts of potassium so pure, that they will give no sodium line in the spectrum when placed in an ordinary flame. In every way he tried to decompose or transmute the pure elements, but all the attempts ended in absolute failure.

A beautiful red light was produced by Professor Dewar by means of chloride of lithium in the flame of a Bunsen burner, and he said that the particular red rays given out by a lithium flame are just those which are absorbed with most avidity by the chlorophyll in the leaves of plants. Chlorophyll cuts off the violet rays of the spectrum, and has a remarkable absorption band in the low red; a bottle of solution of chlorophyll reflects red, and recent discoveries have proved that the maximum effect on vegetation comes from the low red rays, not, as Draper thought, from the yellow. He added that in 1864, in a lecture at the Royal Institution, Helmholtz stated that comparing the production of carbon by an area of cultivated land with the whole energy of sunlight expended during its growth, he calculated that about the $\frac{1}{1000}$ part is conserved in an available form, and may be obtained from its combustion. This estimate is, strictly speaking, the mean agricultural efficiency of a given area of land cultivated as forest; and considering that active growth only takes place during five months in the year, we may safely adopt $\frac{1}{1000}$ part of the total energy of sunlight as a fair value of the conserved power on a given area of the earth's surface in this latitude during the course of the summer. Professor Dewar calculated that if it were attempted to balance by vegetable growth the one hundred millions of tons now extracted annually by Great Britain from her coalfields, it would be necessary to cultivate twenty times the area of our coalfields for the purpose, and the area would exceed that of the whole of the United Kingdom of Great Britain and Ireland. If the whole of these islands were covered for 20,000 years with forests conserving energy from the sun's rays, the result would equal the conserved solar energy of our coalfields.

De la Hire in 1690, and Bonnet in 1754, showed that green plants when immersed in water and exposed to sunlight gave off bubbles of gas, and Ingenhous, in 1779, showed that green plants convert a considerable portion of the air around them into carbonic acid when not exposed to light; he also showed that the absorption of carbonic acid by the plant is due to the light and not to the heat of the sun. Senebier, who worked at the subject from about 1779 to 1804, discovered that the carbonic acid in the air is decomposed by vegetables under the influence of solar light, and that the red rays cause the production of more oxygen than do the violet; he also observed the different heating powers of the rays of the solar spectrum; he investigated the action of light on the colouring matter of flowers and the colouration of fruits. Boussingault began his experiments in 1840. In 1868 he published that leaves exposed to the sun in pure carbonic acid do not decompose it, whereas rapid decomposition takes place when the acid is diluted with atmospheric air, nitrogen, carbonic oxide, hydrogen, or marsh gas. Leaves become asphyxiated when kept in the dark in gaseous atmospheres free from oxygen, and then have no power of decomposing carbonic acid in the sunlight. Essential oils retard the action of the leaf. The vapour of mercury rapidly kills plants, as discovered by Dutch philosophers in 1797. Boussingault found that the upper surfaces of thick leaves decompose more carbonic acid than the under; in the sun the ratio is as four to one, in the shade as two to one. On an average one square yard of leaf surface, acting during a day of twelve hours, decomposes 306 cubic inches of carbonic acid, or $1\frac{1}{2}$ gallon, yielding nearly the same volume of oxygen. In 1869 he found that the luminosity of phosphorus could be used as a rapid and delicate test of the absorption of carbonic acid by the leaf; this test enabled him to prove that leaves decompose carbonic acid immediately on exposure to sunlight, and cease their action instantly in darkness; they effect no decomposition before the presence of chlorophyll can be detected. Experiments by Draper in 1844, supplemented by Sachs and Pfeffer at a later date, proved that

only those rays of the sun which are visible to the eye have the power of decomposing carbonic acid, and announced that those which are brightest to the eye, namely, the yellow rays, are alone as efficacious for this particular purpose as all the others put together. Experiments by Timiriazeff prove that the portion of the spectrum for which chlorophyll has a specially selective absorption is most efficient in the decomposition of carbonic acid. Sachs has recently discovered that the ultra violet rays of the sun are necessary for the production of flowers; when all the ultra violet rays are arrested by a solution of sulphate of quinine, flowering will not take place under the influence of the remainder of the light transmitted, or at most but one meagre flower has been so obtained in the experiments not long since concluded.

Many of the points stated in the last paragraph Professor Dewar demonstrated by experiment. His method of stopping the transpiration of one side of a leaf to see what work was performed by the other side, was to coat it with collodion. He said that it might be asked why leaves did so much work with so small a proportion of carbonic acid as that in the atmosphere. The question was not easy to answer, but it was a fact that sometimes chemical actions would go on best at low pressure; he illustrated this by taking a flask coated inside with phosphorus, and this was not luminous at the ordinary pressure of the atmosphere; when, however, he reduced the pressure inside the flask by means of a few strokes of the air-pump, the phosphorescent coating began to glow in the dark. The amount of carbonic acid given off by animals and fires is not sufficient to sustain the vegetation of the world; most of the necessary carbonic acid comes from sea water, the bicarbonates in which give off one portion of their carbonic acid very freely. Thus the balance is preserved.

He proved that seeds give out feeble heat when germinating by means of some peas which were soaking in water; by the aid of a very delicate thermo-pile it was demonstrated that the temperature of the water was slightly higher than that of the surrounding air. He exhibited some mustard and cress which he had been growing in darkness; they had grown to greater dimensions than if they had been exposed to light, but they were yellow all over, no chlorophyll had been formed, and the growth had all taken place at the expense of the seed; it was a case of vegetables living upon their own vitals, so to speak.

Among substances which transmit the photographic ultra violet rays of the spectrum, and to which glass is opaque, are rock-salt, quartz, extremely thin films of silver, iodine vapour, water, chrome alum, and permanganate of potash. Of these the silver film, chrome alum, iodine vapour, and solution of permanganate of potash in sufficient thickness, cut off the visible rays.

In a true or diffraction spectrum there is much green; in an ordinary spectrum there is little green, the rays at that end being so little spread out in proportion to the blue end. The following is the result of experiments as to the relative intensity of red and green rays from incandescent platinum:—

LIGHT RADIATION OF PLATINUM.

Temperature, Deg. C.	Luminous Intensity.	
	Red Rays.	Green Rays.
954	1.0	1.0
1045	8.27	3.64
1500 ..	154.00	219.00
1775 ..	507.00	809.00

Thus highly incandescent platinum is relatively rich in green rays.

The following are results of experiments as to the amount of luminosity given by the whole of the sky, as compared with the luminosity of the sun at the same zenith distance:—

Place.	Sun.	Sky.	Ratio.
Manchester	43	140	0.31
Kew	150	162	0.93
Heidelberg	263	174	1.51
Pará	163	136	1.00
Paris	222	501	0.44

Professor Dewar stated that the average height of clouds is: Cirrus, $4\frac{1}{2}$ miles; cirro-cumulus, 4 miles; alto-cumulus, $2\frac{1}{2}$ miles; false cirrus, 2 miles; cumulus, 1 mile.

ALVAN CLARK.

[The following has been sent to us by an American friend, but we are unaware to which source to credit it.—Ed.]

By the death of Alvan Clark, at Cambridge (Mass.), of an abdominal disease, America loses a most remarkable man, known throughout the world as the manufacturer of enormous telescopes, famed not only for their size but for their extraordinary accuracy. He was born at Ashfield (Mass.), in March, 1804. His father was a farmer, and young Alvan worked in the fields while a boy and had few opportunities for study. Very early in life his artistic instinct led him to devote much of his spare time to engraving and drawing. At twenty-two years of age he obtained a situation as a calico-printer in a Lowell mill, working at this business for nine years, when he established himself as a portrait painter

in Boston. It was not until he was more than forty years old that he became interested in the study of optics and the construction of telescopes. He thus explains the story of its inception:—"My son, Alvan G. Clark, was at Andover studying to be an engineer. His mind seemed to be absorbed in telescopes. I was a portrait painter then, and I began to study mechanics and astronomy so as to instruct my boy. We experimented together and succeeded in making a reflecting telescope. One of the Cambridge professors was much pleased with some instruments we made, and when we suggested to him that we would like to manufacture improved instruments he gave us great encouragement and we went ahead."

Mr. Clark and his two sons gave up everything else, and in 1846 commenced the manufacture of telescopes at Cambridge (Mass.). The first important recognition came from England. Rev. W. R. Dawes, celebrated for his measurement of double stars, learned that Mr. Clark was constructing instruments of superior purity and power, and ordered a glass, which was furnished in 1853. The performance of this glass excited the admiration of English astronomers, and Mr. Clark found himself suddenly famous. Orders began to come rapidly in also from among his own countrymen, and from that time he was looked upon as one of the few men competent to supply a perfect object glass. In 1860 the University of Mississippi ordered a telescope of Mr. Clark with an aperture of eighteen inches, which was three inches larger than any made at that time. Before it was completed the war broke out, and the contracting party did not take it. It was afterwards sold to the Astronomical Society of Chicago, and was mounted in 1863. It was with this instrument that Alvan G. Clark, Mr. Clark's son, in 1862 discovered the companion of Sirius, receiving the award of the Lalande medal from the French Academy of Sciences. He was given one hundred dollars in gold, however, preferring that sum to the medal.

During the war the Clarks were kept busy manufacturing field glasses for use in the Federal Army. At the time the American observing party went West to view the transit of Venus the Clarks were called upon to supply a heliostat to be used in photographing the transit. The first telescopes made by the Clarks were six inches in aperture and of exquisite definition. The firm confined themselves exclusively to the manufacture of refracting telescopes, and without losing in precision they successively made object glasses of $8\frac{1}{2}$, $9\frac{3}{4}$, 12, $15\frac{1}{2}$, $18\frac{1}{2}$, 23 and 26 inches.

The telescope for which they received the most credit is that at the Naval Observatory at Washington. In 1870 Congress passed a Bill authorising that a contract be made with the Clarks for a refracting telescope, to be the largest in existence. The size was placed at twenty-six inches aperture, and work was commenced upon it in January, 1871. In 1872 the glass seemed absolutely perfect, and a microscopic photograph illegible to the naked eye could be read through it at a distance of four hundred feet. More work, however, was put upon it, and it was finally mounted in 1873. "The figuring of this glass is almost perfect," says Professor Newcomb, its custodian, "its principal defects arising from the secondary aberration, which is inseparable from a large refractor." Soon after the completion of this telescope the order was received for the McCormick telescope, which was to be its duplicate in every respect.

The late Alvan Clark made many discoveries. He also invented a double eyepiece, and an ingenious and valuable method of measuring small celestial areas from three to sixty seconds. Among other of the great works of the Clarks may be mentioned the magnificent telescope for Princeton College, and also one of vast importance bequeathed by Mr. Lick, a wealthy Californian, for an observatory in the Golden State. Alvan G. Clark is now in Europe seeking materials for filling the order for this Pacific Coast institution, which is intended to be in its equipment not surpassed by any in the world. Mr. Clark received the degree of M.A. from Harvard, Chicago, Princeton, and Amherst, and other honours have been showered upon him by American and foreign scientific bodies. His long life has uniformly been one of singular seclusion and modesty.

FRENCH REWARDS FOR PHOTOGRAPHIC INVENTIONS.

Our correspondent in Paris, Professor Stebbing, has occasionally mentioned in these pages something about the rewards offered in France for certain new photographic discoveries or inventions. As this feature of photography does not exist so largely upon this side of the Channel, we quote the full particulars relating to prizes open at the present time to public competition on the other side of the water. As regards the prize offered by M. Davanne, it may be remarked that the man who could win it would probably find it much more profitable to use his knowledge as a trade secret. Competition for two of these prizes, being international, is open to our readers.

PRIZE OF THE MINISTER OF PUBLIC INSTRUCTION.

A prize of 2000 francs (80*l.*), offered by the Minister of Public Instruction, and put up for competition, for photographic objectives principally intended for the use of travellers.

The instruments sent in must be made in France by constructors living in France.

The competitors must send in two classes of lenses.

The one panoramic, embracing an angle of at least 100°.

The other constructed for producing negatives of not so great an angle. This class should unite the qualities of rectilinearity, flatness of field, sharpness upon different planes, equality of luminous field, and intensity of illumination sufficient to produce rapid impressions whenever necessary.

The instruments sent in should be constructed to cover plates of the dimension of 18 x 24 cm. Those which can be used for copying and the obtaining of human types should have no longer focal length than 0.25 m. or 0.30 m., and give sharply and without deformation a head of 0.03 m. at least, with a time of exposure which, with wet collodion, would not exceed four seconds in the shade.

The size and weight of these instruments should be as limited as possible, and the mounting simple. The diaphragms, if more than one, should be attached to each other so that they cannot be separately lost. Their price should be within the limits of the prices usually accepted for good lenses.

THE GAILLARD PRIZE.

A prize of 500 francs (20*l.*), offered by M. Gaillard, will be given to the discoverer of a new process for printing positives, or of a notable improvement in the method hitherto in use.

The process which gains the prize must fulfil the following conditions:—

1. Rapidity of exposure, whether it be to solar or artificial light.
2. Uniformity of manipulation and in the results obtained.
3. The proofs should have agreeable tones under the control of the will of the operator.

Between different processes fulfilling these conditions, preference will be given to those which promise the most permanent results.

This competition is international. The Presidents and Vice-Presidents of the Photographic Society of France, and of its Committee of Administration, are excluded from participating in it.

The parcels sent in by the competitors should include—

1. A sealed enclosure containing a description of the process, the formulae, the manipulations, in a word, all the information necessary for the complete working of the process.

2. Several photographs produced by the indicated means.

The opening of the sealed envelope will be made in the presence of the competitors or their delegates, or fifteen days after a written notice has been sent from the Secretary of the Commission.

The competitors shall give a demonstration before the Commission, or, if they are unable to be present, they shall abide by the results of the trials which the Commission may make, or cause to be made before it.

The report of the Commission shall be made within one month of the conclusion of the last trial.

Particulars of the successful process, and of exact information in relation thereto obtained by the Commission, shall be published at the same time that it gives its decision, and will become public property.

THE DAVANNE PRIZE.

A prize of one thousand francs (40*l.*) will be given to the discoverer of a process for obtaining negatives fulfilling the following conditions:—

1. Facility of preparation of the sensitive surface.
2. Sensitiveness and keeping qualities comparable with those of preparations actually in use.
3. The negatives obtained shall approximate in fineness and permanence to those obtained by older preparations.

The parcel forwarded should contain—

1. Sealed information describing the process in all its details.
2. The negatives obtained and positive proofs taken from them.

The opening of the sealed letters will take place before the Commission which has the duty of judging, and in the presence of the competitors.

The competitors shall demonstrate before the Commission, or, if they cannot be present, shall abide by the results of trials made by it.

Particulars about the successful process, and exact information about it, will be published at the same time that the decision of the Commission is made known, and will become public property.

The competition is international.

CONDITIONS COMMON TO THE THREE COMPETITIONS.

The time for competition will be closed on the 31st December, 1888. Parcels should be received not later than that date at the offices of the Society, 20, Rue Louis-le-Grand, Paris.

The Commissioners to form the jury will be nominated by the Society at its December meeting in 1888. Competitors cannot serve on the jury. — *Bulletin de la Société Française de Photographie.*

Our Editorial Table.

MESSRS. MARION & Co., Soho-square, have issued a "Universal Ten per cent. Developing Set" which they correctly say will prove a great boon to all amateurs. On opening the neat case in which the set is contained, we find six glass-stoppered bottles and two graduate measures. Three of the bottles contain solutions respectively of pyrogallie acid, bromide of potassium, and ammonia, all of them

being ten per cent. solutions—the other three bottles are for mixing.

The use of these solutions will be readily understood from the following directions which accompany the set:—

“On each bottle of the ten-ounce solution is a list of the leading plates, and against each the correct formula for development expressed in minims, so that our ten per cent. solution will serve, not only for our own Britannia plates, but for most others. The directions for use are simple—take as an instance to make up a developer for the Britannia plates. On the bottle of pyro against the word Britannia will be found twenty minims. This signifies pour into the minim measure the pyro solution up to twenty; after measuring it pour it into the larger glass measure, perform the same operation for the bromide, and then for the ammonia, taking care only to measure out the quantity of minims marked on each bottle against the word Britannia. Of course, after measuring, each solution is poured into the larger glass measure. Now make it up to one ounce by adding water. If two, three, or four ounces of developer are wanted, of course the minims must be increased in like proportions, viz. twice, thrice, or four times also. If it should be desired to make up stock solutions in the two ten-ounce mixing bottles, and in developing to take equal parts of each, the minims that are given for one ounce of the different solutions must be multiplied by twenty. Thus, in the Britannia formula, put of pyro solution (20 minims \times 20 =) 400 minims into one of the bottles; and of bromide ammonia (22½ \times 20 =) 450 minims into the same bottle, then make up to ten ounces with water. In the other bottle would be the ammonia (45 minims \times 20 =) 900 minims and make up to ten ounces with water. For developing take equal quantity of solution from the two bottles, and so for each make of plates according to formulas given on bottle.”

Of the various appliances which have been introduced to simplify photographic operations to the amateur, Marion's ten per cent. developing set will prove to be very far indeed from the least to be useful, and to receive a glad welcome accordingly.

From H. Senier, Norwood-road, S.E., we have received samples of Wolff's patent mounts, the peculiarity of which consists in the card being coated with gum or other adhesive substance. To mount a print upon such cards, all that is necessary is to lift it from the washing water, remove the superfluous water slightly by blotting-paper, and lay it down in its place upon the mount, afterwards applying pressure.

EN SUITE with the *Bicyclist's Handbook*, which we noticed a few weeks ago, Mr. Henry Sturmey has issued a work of similar character devoted to photography. It consists mainly of a compilation from dealers' catalogues made by W. D. Welford, of Birmingham.

We have received from William Tylar, Birmingham, one of his washing and drying racks. It is made of japanned wire with metal pins, covered with indiarubber, to form the divisions. He also sends us a specimen of his metal printing frames, which is formed on the same general plan as those introduced many years ago by Cubley & Preston, of Sheffield, only theirs had a wooden back, whereas this is formed of rigid metal.

Mr. Tylar also sends us samples of his folding developing trays. These will prove useful, especially to the tourist. They are so constructed as to lie flat, yet by means of suitable folds and clips at the corners they can instantly be formed into trays of all the requisite depths for developing, fixing, and washing negatives. Each has its special use printed legibly on the flap by which it is held when in use, hence confusion cannot arise.

J. T. CHAPMAN, Manchester, has brought out a series of handy books, small in size, but replete with useful information. One of these contains simple instructions for printing, toning, fixing, and finishing photographs on albumenised paper. Another is devoted to modern photographic lenses, with a synopsis of their construction and uses; while a third contains formulæ and directions for developing negatives, transparencies, and opals.

Those who use petroleum (and who does not?) will find a vast amount of sound information concerning it in a pamphlet entitled *Petroleum: Valuable Hints to those who use it*, being a series of articles on the subject by well-known authorities. It is published at 402, Strand, London.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 12,521.—“Improvements in the Preparation of Films for Photographic Purposes in Monochrome or Polychrome.” J. BROWN.—Dated September 15, 1887.

No. 12,608.—“Photo Etching, that is to say, an Invention for the Production by Photography of Portraits or Pictures having the Characteristics of Copperplate Etchings.” M. M. SCOTT and T. SCOTT.—Dated September 17, 1887.

No. 12,674.—“Process for the Manufacture of Sodium-Ammonium-Sulphite and Converting the same into Sodium, Sulphite, and Sodid Hydrate.” Communicated by G. M. Tauber. W. L. WISE.—Dated September 19, 1887.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
September 27 ...	Great Britain (Technical).....	5A, Pall Mall East.
„ 27 ...	Bolton Club	The Studio, Chancery-lane, Bolton.
„ 28 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
„ 29 ...	Liverpool Amateur	Royal Institution, Colquhoun-street.
„ 29 ...	Oldham	The Lyceum, Oldham.
„ 29 ...	London and Provincial	Mason's Hall, Basinghall-street

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.
On Thursday, September 15, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. William England presided.

The HON. SECRETARY exhibited etchings of places in Edinburgh visited recently by the Photographic Convention, he did not know by whom executed.

Mr. C. H. TRINKS said that in Norway recently he had greatly under estimated the actinic power of the light, so had over exposed most of his plates; his best results were with $\frac{1}{4}$ and drop shutter exposures. In Greece and Turkey he had not found the light so photographically powerful.

Mr. HERBERT STARNES had a friend who had taken views in Norway five years ago, and developed them but a few days ago; the results were all that could be desired.

Mr. S. G. B. WOLLASTON had obtained insufficient density in the high lights when developing plates which had been kept four years after exposure.

Mr. A. COWAN had found that plates grew more sensitive by keeping; they probably would not do so but for the vapour of water in the atmosphere.

Mr. STARNES said that high temperature caused deterioration of plates kept therein for a very long time.

The CHAIRMAN thought that a moderate amount of heat did not injure them.

The HON. SECRETARY exhibited sensitised albumenised paper which had kept good for two years wherever three thicknesses of it had protected the remainder underneath.

Mr. A. MACKIE and Mr. F. A. BRIDGE found ready sensitised paper to work better when kept one or two months.

The CHAIRMAN, to get more vigour with thin negatives, sometimes place them where they would take a whole day to print, and thereby obtained more contrast.

Mr. W. E. DEBENHAM's experience did not support the last statement.

Mr. COWAN thought that comparative experiments on the point should be made.

The CHAIRMAN had found the rule he had stated to hold good in copying also.

Mr. E. CLIFTON had seen experimental results obtained by Mr. George Smith which supported Mr. Debenham's view. Exposures for a longer time to a weaker light gave the same result as shorter exposures to a stronger light, on the principle that the intensity of light varies inversely with the square of the distance.

Mr. A. L. HENDERSON, with several days' exposure upon washed sensitised paper, had obtained vigour and detail which otherwise would not have appeared.

The CHAIRMAN with many wet plate negatives had found that they gave much better prints in the spring than in the winter.

Mr. HENDERSON said that if a piece of sensitised paper were printed in the sun to a certain depth and another piece of the same paper printed in weak light to the same depth they would be of different colours.

Mr. DEBENHAM, assuming the absence of error in the last statement, was not sure that difference of temperature would not have an influence.

Mr. CLIFTON had known heat to change an exposed print from a purple to a red colour.

Mr. W. M. ASHMAN said that there was a distinct difference in colour between photographs printed in a weak and strong light.

Mr. A. P. HIGGINS pointed out that in photography in natural colours difference of illumination produced great differences of result in printing upon chloride of silver.

Mr. ASHMAN had found no practical difference in printing weak negatives in a strong or weak light.

The CHAIRMAN stated that with slow printing bronzing could be obtained in the shadows under weak negatives.

The meeting was then made special, and the following members were elected as the first Committee of Management of the Association:—Messrs. W. M. Ashman, T. Bolas, F. A. Bridge, J. T. Collins, A. Mackie, L. Medland, H. M. Smith, and C. H. Trinks.

Correspondence.

Correspondents should never write on both sides of the paper.

DISCOLOURATION OF PORTRAITS IN OILS.

To the EDITORS.

GENTLEMEN,—“An Amateur” wishes to know “the circumstances under which portraits in oil (not on photographic base) will become discoloured, as described by ‘Free Lance,’ and the causes that lead to same.” First, I must point out that “Free Lance” never described the discolouring in question. After inquiring about the pictures, he merely was told, “Oh, the faces went all black.” “An Amateur” will understand that it is impossible, and would be, indeed, audacious, to form and put forward a distinct opinion as to what really occasioned the change of the colours in this particular case on such scanty revelation.

Discolouration may arise from smoke of the fireplaces, or from cleaning the rooms by careless hands, who even will rub the pictures over with dirty flannels, &c., or it is caused by the oil in which the colours are ground. One more of the many factors which contribute to blacken or discolour oil paintings is to be found where the second painting was done before the first or ground painting was thoroughly dry, or when the varnishing was practised too soon. The second painting should not be before the preceding painting was allowed to dry, at the least, from three to four months, and any varnishing of the finished picture can only be done with safety after an elapse of twelve to eighteen months. The oils used should be bleached for at least five years, and the varnish at the least for ten years.

Any picture gallery will show to “An Amateur” decayed, damaged, and blackened conditions of oil painting; but “how to restore them,” I must recommend him to consult some works written upon this subject—for example, such as Field’s *Chromatography*.—I am, yours, &c.,

A PAINTER.

YELLOW STAINS IN THE NEGATIVE.

To the EDITORS.

GENTLEMEN,—Is it known that sal-ammoniac prevents the yellow stain when using the carbonates?

The following I find to do very well for landscapes:—

Carbonate of soda	15 grains.
Carbonate of potass.....	15 ”
Sal-ammoniac	5 ”
Bromide of ammonia	1 grain.

I get stains when I add the bromide in a 1-10 solution. I therefore use one ounce water, one grain bromide, and add the concentrated solution.—I am, yours, &c.,
J. C.
Southport.

PRINTS MOUNTED ON GLASS IN OPTICAL CONTACT.

To the EDITORS.

GENTLEMEN,—What can be the reason—a fair and valid reason—why such a dead set is made against this most beautiful process by exhibition committees, and (if I am rightly informed) by some individual judges, too?

Can any arguments be stated against its use which are strong enough to be unanswerable? A circular has lately been issued by the Dundee Association for an exhibition in February next, in which I notice that “Photographs mounted on glass” will be received for exhibition only, i.e., they are excluded from competition for prizes. Why so? What advantage of an unfair nature can such a method of mounting prints give to any photographs? It appears to be prompted by some unaccountable feeling of jealousy that the print in optical contact with glass should be so beautiful in itself. The process certainly cannot alter the actual quality of a print—if it is first rate in itself as a print before mounting it will still be first rate after attachment to the glass plate, neither more nor less so; and, given a dozen prints by different operators of equal merit as “pictures,” no unfair advantage would accrue to any of them if all are mounted alike in optical contact with glass. But if one operator argues thus, “I do not wish to mount mine in this way, and because I won’t adopt it you shan’t do so and compete against me for prizes,” is a very “dog in the manger” sort of argument.

I maintain that the five following important advantages belong to this process of mounting, and particularly for purposes of framing, whether for public exhibition or not.

(1). It is the best method of all to enable any person to see a photograph correctly, be it good, bad, or indifferent *per se*. The exquisite delicacy of the photographic detail is to some extent lost on paper which is in the

least rough, scratchy, or uneven in surface, and the glaze of albumen prevents its being seen except in certain angles of light; but the cementing to a smooth, even surface like glass by gelatine enables the eye to collect all this delicacy of definition readily, and to enjoy it thoroughly. A print on any glazy surface, placed loosely behind a sheet of glass, has two extra reflecting surfaces to prevent perfect vision, and such is exactly the condition of an albumenised print exhibited loosely behind a framed glass.

(2). It is a more permanent method than any other of preserving photographs if proper precaution is taken to obtain a cement of proper quality, free from acidity, as the picture is to a great extent hermetically sealed from the action of air and damp, and might be made absolutely so if the back of the paper is treated with suitable waterproof compound or varnish.

(3). For framing purposes it is far more economical in the weight and cost of glass, because a print only requires a glass support about half an inch larger each way than itself, which can be put direct into a “cut out” mount without any glazing of the frame, the area of glass for which (allowing a fair margin round the print) would be about three times the square measurement of the actual print. Hence, trebly greater weight for transit and cost of glass for frames when glazed all over.

(4). If properly worked in the manner recently described by the Editor of this JOURNAL, the process is far easier and quicker to manipulate than mounting on surface of cards or mounts of any kind.

(5). But the prime advantage of all is the beautiful optical effect it has on the prints, which I cannot quite understand; it seems to harmonise the lights and shadows of the picture more perfectly than any other treatment. Artificial glazing by enamel does not produce the same effect, and becomes highly offensive to many—under glass the heavy shadows become more transparent, and details visible which were before sunk in oblivion, and the general effect is richer and more transparent. The only precaution necessary is, that prints intended to be so mounted ought to be purposely printed a shade or two deeper all over than those for mounting on surface of cards, and I do not know any better way of utilising over-printed copies than by mounting them in optical contact on glass.

I think I have shown five good reasons why this style of mounting prints (for framing) ought to be encouraged rather than the reverse, and if anyone can give good ones to the contrary, I am open to conviction. A little ventilation of public opinion on the point will be a good thing. Perhaps Mr. Rattray, as Secretary of the Dundee Association, will give us their reasons for taboing this most exquisite process, and disqualifying pictures so mounted from competition for prizes.—I am, yours, &c.,
Lux.

PHOTOGRAPHIC EXHIBITION IN DUBLIN.—ENLARGEMENTS.

To the EDITORS.

GENTLEMEN,—In my last letter to you on this subject I inadvertently omitted to mention that the Committee had decided to offer, in addition to those in the prospectus, a special medal for enlargements *bonâ fide* the work of amateurs.

Pictures competing for this medal must be marked plainly on the label (preferably in red) “Amateur enlargement for special medal.”—I am, yours, &c.,
GREENWOOD PRM, Hon. Sec. Exhibition Committee.

Monkstown, Co. Dublin, September 20.

CORNWALL EXHIBITION.

To the EDITORS.

GENTLEMEN,—I wish to correct an error, in your last issue, with reference to my exhibits at the Cornwall Exhibition. They are criticised as enlargements, whereas they are all direct from life on twenty-five-inch plates. I am anxious to know if this is an error on the part of the Judges, or merely a mistake your correspondent has fallen into. Trusting you will, in justice to me, insert this in your next issue.—I am, yours, &c.,
W. CROOKE.

103, Princes-street, Edinburgh, September 19, 1887.

Exchange Column.

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

Will exchange half-plate portrait lens for good exterior background or posing chair.—Address, A. TAYLOR, 77 and 79, Fore-street, Ipswich, Suffolk.

I will exchange a cabinet-maker’s first-class tool chest for a half-plate camera, lens, burnisher, or accessories.—Address, JOHN MCPHER, 213, Links-street, Kirkcaldy.

I will exchange five years’ BRITISH JOURNALS OF PHOTOGRAPHY, up to August, 1887, for either half-plate or whole-plate view lens.—Address, C. CHAMBERS, 13, Tipping-street, Stafford.

Wanted, 12×10 tourist’s camera with double slide; exchange, lantern with four-inch condenser, half-plate rectilinear lens, and cabinet burnisher.—Address, MASON, 11, Sea View, Hartlepool.

Will exchange Martini-Henry rifle, '380 bore, and screwless revolver, for whole-plate camera and rectilinear lens or good half-plate portrait lens.—Address, J. THOMPSON, Rhine Studio, Yonghal.

Will exchange three gem lenses for six whole-plate, twelve cabinet, and eighteen carte-de-visite portraits, unmounted.—Address, R. W. F., Alfoxton-villa, Laurel-road, Highfields, Leicester.

Three half-plate double slides, half-plate lens, home-made bellows camera, and tripod stand, will be given in exchange for studio camera, half-plate size or larger.—Address, W. R. FAIREY, Harrold, Bedford.

I will exchange 10x8 view lens and Steinheil enlarging lens for quarter-plate Dallmeyer's rapid rectilinear or Ross' rapid symmetrical, same size.—Address, J. D. EDWARD, 43, Great King-street, Edinburgh.

Will exchange good German-made microscope with two eye-pieces, three objectives, magnifying 20-550 diameters, for a camera and accessories not less than whole-plate.—Address, C. ROWLAND, 39, Cecil-street, Carlisle.

Wanted, a half-plate Rectigraph, Optimus, or other good lens, or a Knox hornisher, eight-inch roller; exchange, revolver, by Colt, in mahogany case.—Address, WILLIAM FOX, 15, Cumming-street, Harlshill, Stoke-on-Trent.

Will exchange a bellows-body, reversible back, whole-plate camera, fitted with three double backs, and rectilinear lens; wanted, a tricycle, latest pattern, centre geared, close folding, &c.—Address, MYLES GARNER, 298, Holloway-road, N.

I will exchange carte lens, by Squire, five-inch back focus, for a carte lens of shorter focus or half-plate rectilinear; also a sewing machine on stand for Victoria camera.—Address, H. M. ASHLEY, Photographic Studio, Eldade-hill, Plymouth.

I will exchange Marion's 3 1/2 x 2 1/2 pocket landscape camera with lens, three double dark slides, and three dozen rapid plates to fit, all new and unused, for a good quarter-plate camera with three or more double slides. Cash adjustment.—Address, P. C. WATT, Hingham, Attleborough.

For exchange, tripod and studio stands, several head rests, various lenses and cameras, large-size magic lantern, backgrounds, Victoria camera, nine lenses, studio table, chair, &c. Wanted, wide-angle lens to cover half-plate, backgrounds, and accessories.—Address, J. W. WALMSLEY, 262, Walton-road, Liverpool.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

B. C. C.—No satisfactory method. In ordinary landscape negatives there is none at all.

GEO. FERDIE (Copiapo, Chili).—Your letter received. It was indeed a curious coincidence.

COLESWEGEN.—Immerse the negative in bichloride of mercury, which will in some measure render it less dense. If we have time we shall treat the other subject next week.

EMERY asks: "Can I with safety take abroad pyre in one-pound tins? How long will it keep?"—The pyrogallic acid may be taken with safety. It keeps well in the dry state.

T. B. H. asks what kind of lens is the best for taking photographs of pottery ware.—No particular lens is necessary; any will answer. One of the rapid series is as good as any.

UTILITY.—1. We shall be glad to receive the communication.—2. Specify diameter and focus of lens.—3. Send us the details of the invention you wish to patent or obtain the necessary forms from the Patent Office.

C. P.—I. About what time? We have no recollection of the matter.—2. All that can be said upon the subject has appeared in our volumes for the last or previous years. We fear that "our thousands of readers" would not appreciate the space being devoted to a repetition of what has appeared so recently.

W. HALLETT writes: "Will one of your readers kindly help an amateur with a suggestion? I have always used an ordinary blow-through jet, but contemplate using a mixed jet in the Ethoxo form, using oxygen in compressed cylinder. If pumice cylinders are used in tubes is there any possibility of accident, as this seems the extreme of precaution?"

H. BENTLEY says he has broken a porcelain dish and mended it with one of the commercial cements, and asks if this cement will injure the silver solution.—As we do not know the composition of this particular cement, which, no doubt, the manufacturers keep as their trade secret, we are unable to say. The simple experiment of leaving a little solution in the vessel for a day or two will settle the question.

AN OPTICIAN.—If we correctly understand the Merchandise Marks Act, you render yourself liable to fine or imprisonment by selling opera and race glasses made abroad but bearing your own name engraved thereon as the reputed maker. The Act specifies very strictly that such articles must bear the name of the real manufacturer if any name is to appear at all. But we imagine that by engraving before your own name the words "warranted and sold by," or simply "warranted by," no action for fraudulent representation would be sustainable.

J. HAMPTON says: "Will you be kind enough to tell me how to neutralise with ammonia the following solution:—One ounce of sulphuric acid, water, one ounce; add one hundred and twenty grains of gelatine, then add five ounces of water? I have used the blue and red litmus papers; I cannot get the solution neutral with the papers."—Does our correspondent really imagine that the object of litmus paper is to neutralise an acid or alkaline solution? Its sole use is to indicate whether any solution is or is not neutral. To neutralise with ammonia, add this substance until the litmus paper, both red and blue, remains unaffected in colour.

A. W. C. writes a long letter, lamenting that England is so far behind the Continent and America in photo-mechanical work. He says that in Germany lichtdruck prints are produced at far less price than they are done here, and for this reason publishers are having their work executed abroad.

W. P. asks: "1. Cause of spot in background of enclosed print.—2. Best preventative.—3. Are slightly blistered albumen prints unsafe? i.e., do the small blisters harbour hypo in spite of washing?—4. Best preventative of last-named evil."—Reply: 1. An air bubble sticking to the print when immersed in the fixing bath.—2. Remedy obvious.—3. They are always suspicious. Sometimes they make themselves apparent after a time, though not always.—4. Avoid the use of paper that produces blisters; next to that add water gradually to the fixing bath after the prints are fixed, so as to avoid transferring them direct from the strong hypo solution into plain water.

J. E. GOWER writes: "1. Having made an instantaneous shutter, I wish to stain it, but as it is made in some places of very thin wood (one-eighth of an inch) I am afraid the stain might make the wood warp. Do you think this would be the case? I should use Judson's stains but do not know whether they are made up with water or spirit.—2. As my hypo fixings become used up I throw them all into a large glass jar, but find after a few days that a thick sediment falls to the bottom; is this silver in any form?"—In reply: 1. If an aqueous dye be employed, and it be applied to one side of the wood only, it would, in all probability, cause warping; but if it were applied to both sides equally and dried evenly this would be avoided. A spirituous dye would be the best to use.—2. The sediment contains some silver, no doubt, but not all that is in the solution. Add sulphide of potassium so long as a precipitate is produced. This precipitate is the sulphide of silver.

A. J. CORRIE writes: "I have been using the Eastman negative paper for some time and got quite satisfactory results with all exposures excepting those made with the drop shutter; in these the paper fogs always, more or less—generally more, as the enclosed negative will show you. The exposure was with a common drop shutter unaccelerated by any spring; aperture of lens, about f/16; a wide sunlit view, early in forenoon; development, normal; result, the object failure enclosed; which, please bear in mind, is like to many others of various subjects, but all exposed with the shutter. The fog appears soon, but in the case of longer exposures the shadows and edges of the papers are perfectly clear. The shutter is certainly light-tight. I have specially examined it before writing. I should suspect my light were it not that other negatives are so clear in shadows and edges. Is the paper more unfitted for instantaneous work than glass?"—As our correspondent finds that when he does not use the instantaneous shutter his negatives develop free from fog, and when he uses it the pictures are fogged, it is clear that the shutter arrangement allows some light to pass the lens other than during the exposure. The enclosed example proves that light has reached the paper by some means or other, and doubtless through the shutter. The paper itself is as well suited for instantaneous work as plates.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, September 23, 1887, will be on *Developers and Developing*. Saturday outing at Dagenham. Trains from Fenchurch-street near two o'clock.

The photographic public are cautioned against a man who tells a pitiful tale of having lost a situation in Scotland or in the West of England, and who says he has travelled to London on foot, and is starving, &c. He called on some firms here more than a year ago with this tale, and has within the past few days been repeating this story. There is more than an element of suspicion about this matter.

ERRATA.—Mr. W. E. Debenham writes: "I observe that you have reprinted from the *Photographic Times* an article of mine on *Permanent Intensification with Mercury*. There are, however, in it two *errata* which have been corrected in a later number of the *Photographic Times*. On the first line of the sixth paragraph the reading is "better forced negative;" the word "forced" should be deleted. The other misprint is in the twelfth line of the eighth paragraph, where it reads "one quart; fill a pint bottle." It should be "one quarter fill a pint bottle."

THE AMERICAN CONVENTION.—Whether this Convention was a success or not we are left in some doubt at present, owing to the conflicting statements that have appeared concerning it in American journals, one of which characterises it as having "proven the most discordant Convention in the history of the Photographers' Association of America." At any rate several papers were contributed, even if they were not all read. The meeting next year will be held in Minneapolis, Minn., under the presidency of E. Decker, of Cleveland, Ohio. The Vice-Presidents are C. W. Motes, Atlanta, Ga., and F. W. Guerin, St. Louis. W. H. Potter, Indianapolis, is Secretary, while the office of Treasurer will continue to be filled by G. M. Carlisle, Providence.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1430. VOL. XXXIV.—SEPTEMBER 30, 1887.

THE EFFECT OF MOISTURE IN PRINTING.

At the meeting of the London and Provincial Photographic Association of the 15th instant, an old and somewhat vexed question amongst silver printers was revived, namely, In printing from a thin negative will the best result be obtained by printing it in a strong or in a feeble light? Some of those present gave it as their experience that with a feeble negative the best result would accrue when it is exposed for a prolonged period to a dull light. Mr. W. England even mentioned that with thin negatives he sometimes placed them in such a subdued light that they took an entire day to print. Others expressed the opinion that weak negatives might be quite as successfully printed, and more so, in a strong light, while some said that it mattered little what kind of light was used. In the end the question, simple though it be, was left very much as it was a quarter of a century ago—opinions divided.

On one point the meeting appeared to be tolerably unanimous, and that was that a different coloured print is obtained when it is printed in a strong light to what it would have been if it were printed in a weak one. This fact can easily be demonstrated by exposing two pieces of the same paper, the one to a feeble light—say at the back of a room facing the window—when it will take a long time to darken, and the other out of doors or in sunlight. Under these conditions it will be found that the former will partake of a somewhat cold or slaty tone, while the latter will be much redder. The stronger the light, as a rule, the redder will be the tint assumed by the paper in printing, whether it be exposed behind a negative or not. In the toning bath also the two papers will be found to act differently.

There is one point in connexion with printing which is frequently overlooked, or to which no importance is attached by many operators, namely, the hygroscopic condition of the paper at the time of printing. This very materially influences the colour which the print takes in the frame and also affects the after toning, which a very simple experiment will prove. Let a piece of paper be sensitised in the ordinary way and dried to a normal condition. Then let it be divided into three portions. Now place one portion in a damp situation where it can absorb moisture, and let another portion be made "bone dry" or crisp by drying it by heat, while the third piece is retained in its original state. If these three pieces be now exposed to light, whether weak or strong, taking care that their hygroscopic condition is not altered, it will be seen that they each take a decidedly different tint as they darken. If they be afterwards toned it will be noticed that they will all behave differently; the bone dry one will tone the slowest of all and will rarely go beyond an unpleasant brown stage without becoming mealy,

while the other two will both tone quickly, though one quicker than the other, and to a deeper tint, and without mealiness.

Some years ago cases containing chloride of calcium were introduced for preserving sensitive paper for long periods. This they did by virtue of the calcium salt absorbing the whole of the moisture from the paper, and retaining it in an exceedingly dry state. It was soon found, however, that paper kept for any length of time under this condition could not be readily toned, and that it also produced mealy prints, hence the cases soon fell into disuse.

The effect of moisture in the paper during printing was first brought under our notice some years ago, and was duly treated upon in the JOURNAL at the time, and quite recently it has cropped up again in two or three instances where toning difficulties were met with. We shall quote one case which is typical of each of the others.

During the past summer, in the printing establishment of a London house where the paper is sensitised on the premises, a difficulty was experienced in toning the prints, and when they were toned they were always of a dirty colour and usually more or less mealy. Particularly was this the case if the toning was carried beyond a very warm brown stage. Different samples of paper, sensitised under different conditions of the bath, were tried, and also ready sensitised paper, but to no purpose. From our past experience we at once suspected that excessive dryness was at the root of the trouble, and this proved correct. We found that the printing was conducted in a small building of wood and glass, which became exceeding hot during the day, and in this room the printing frames were kept when out of use, consequently they and their pads became thoroughly desiccated with the great heat and the unusually dry state of the atmosphere. The paper was sensitised in a small closet partitioned off from the printing room, and, of course, it was equally as hot and dry.

We suggested that a certain number of the printing frames should be transferred to a damp cellar and allowed to remain there, with their pads and backboards exposed to the moist atmosphere for the night, and that in drying the paper it should not be allowed to reach a crisp condition. This was done, and the prints obtained in these frames on the following day were of a totally different colour from those printed in the others. In the toning bath there was a wide difference in the behaviour of the two series of prints. Those printed in the frames which had been kept in the damp toned easily and assumed a rich and brilliant tone, while the others were, as usual, of a dingy brown colour, with a tendency to mealiness, according to the depth the toning had been carried. Indeed, these prints very closely resembled those which used to be

obtained with paper which had been kept in the chloride of calcium cases. In fact, the pads and frames had become so abnormally dry that they absorbed what little moisture the paper may have retained in the same way as did the calcium in the cases.

The difficulty often met with in toning ready sensitised paper may in some instances arise from its excessive dryness at the time of printing. In more than one instance we have proved this to be the case.

LA NATURE, in its current number, gives its readers an illustrated account of the photographic excursions of a society of amateur photographers which is of a highly interesting, not to say exciting, character. The particular object of the first excursion was the securing a number of negatives of subjects of especial interest requiring instantaneous exposures, and from the present account some considerable amount of success attended their efforts. The first subject was the photographing the firing of a shot in a stone quarry, 50,000 cubic metres of rock being disintegrated by the shock. An engraving, from a photograph, is given of the sight immediately after the explosion, the broken masses of stone and dust filling a vast space, while in the foreground, apparently in a post of considerable danger, is shown a plucky photographer just in the act of exposing a plate upon the falling mass. After science came amusement, and the assembly of amateurs next trooped off to the circus to a specially arranged performance, and tested the capabilities of their plates upon equestrian and other subjects of the *ménage*.

MR. VERNON HARCOURT'S standard light has been experimented upon by a committee of the British Association; but in the report given it was clearly stated that the experiments have been insufficient in number, and that therefore another year would have to pass before they could place the standards upon a proper footing. Meanwhile, the Board of Trade have not been idle, and their chemist, Mr. Dibdin, has issued his report upon this light standard. He recommends the Board to take steps at once to secure the adoption of Mr. Harcourt's invention—the pentane air gas standard—as the legal standard of light in this country. If such a standard were adopted, and copies of the instrument employed in the various towns of the country, it would be a very simple matter for every photographer to have a gas-burner tested at ordinary pressure and standardised for his own town, as it were, for use in experiments with comparative exposures. Thus if a certain burner, clean and in good condition, were marked to possess at ordinary pressure so many candle power, it would, when comparing a plate with results obtained with a light of different power, be a simple matter of calculation as to what distance to place the plate from the burner, so as to subject it to conditions exactly similar to those the comparison plate experienced.

INDEED, seeing the great value any process would possess that would enable a photographer readily to test the rapidity of a plate for himself without investing in an expensive sensitometer, it is somewhat surprising that there are not standardised burners commonly offered for sale, standardised, that is, as to amount of gas passing through them. The quality of a gas in a particular neighbourhood would not be likely to vary so much from one time to another as to vitiate the practical value of the results, and the illuminating value could easily be found for any one burner. Pressure of course varies; though here, again, not to any important extent when it is divided into day pressure and night pressure. Its amount at any moment is roughly formed, almost in an instant, by slipping a piece of glass tube into a length of indiarubber tubing attached to a gas connexion. The tube is perpendicularly dipped some inches into a vessel of water and the gas turned on, when it will be found that the gas will not allow the water in the tube to come up to the level of the surrounding portion. The distance in inches between the two levels—the outer and the inner—gives the number of inches pressure of gas.

THE subject of gaslight naturally leads to electric lighting and lamps, a curious experience with regard to the latter having recently been made public. One of the drawbacks to the use of electric glow lamps

(of little value for portraiture, though most valuable for general dark room and other illuminating purposes) is the repeated need for replacement of the lamps after a certain period of use, on account of the deterioration of the transparency of the glass globes, owing to a deposit of volatilised carbon that usually takes place. A thousand hours is usually given as the maximum "life" of such a lamp, which in practice means, perhaps, the renewal twice or three times a-year of all the lamps in an installation—a very serious expense. But, as against the reality of this maximum, it is stated that in the office of the *Toronto Globe* there is now a thirty-two-candle Edison lamp, which has been burning full power five hours every night, six nights a-week, ever since the installation of the system in November, 1884. The lamp was guaranteed for six hundred hours, but is still burning with undiminished power after nearly five thousand hours service.

A NEW antiseptic agent, which should be of some value in photography, has been discovered by Mr. William Thomson, F.R.S.E., F.C.S. He was engaged in trying to find such a substance which was not volatile and was not destroyed by oxidation. He tried various chemicals on flour paste, and found that those bodies which had the most remarkable antiseptic properties were the compounds of fluorine—hydrofluoric acid, the acid and neutral fluorides of sodium, potassium, and ammonium, and the fluosilicates of those bases. He considered fluosilicate of sodium to be the one which, for its powerful antiseptic and unobjectionable properties, was best suited for the general purposes of an antiseptic. It is non-poisonous, possesses no smell, and is sparingly soluble in water. A saturated solution contains only '61 per cent., and yet has a value equal to that of a solution one part of bichloride of mercury in a thousand of water—a solution which hitherto has, perhaps, been considered the best antiseptic known for general purposes. It is, however, clear that its use is entirely inapplicable in a mounting medium, while the new salt should be of the greatest use in that direction. Thymol is a favourite chemical for this purpose, but its smell is by many considered a bar to its employment.

THE LATE JAMES G. TUNNY.

It is with grief that we record the death of Mr. James Good Tunny, of Edinburgh, which took place at his residence, 19, Salisbury-place, Edinburgh, at half-past six o'clock on Saturday morning, the 24th inst.

Mr. Tunny was one of the oldest and most advanced photographers in this country, having been professionally engaged in the art long anterior to the introduction of the collodion process. He invariably claimed that he practised this process previous to its publication by F. Scott Archer, and he always gave the credit of its discovery to Le Gray. It is worthy of notice that Mr. Tunny from the very first employed protosulphate of iron as a developer, as suggested by Le Gray, and this at the time when Archer was advocating pyrogallie acid as one of the features of his collodion process. At that time, over thirty-five years ago, Mr. Tunny had numerous pupils among the Scottish gentry, many of whom were imbued with the enthusiasm which characterised the master, who was thorough and enthusiastic in everything he undertook.

When the Photographic Society of Scotland was formed in 1856, under the presidency of Sir David Brewster, Mr. Tunny was one of its most active members, and continued to be so until its demise. During its life he contributed largely to its efficiency both by papers on practical topics and *vivâ voce* utterances. He subsequently became a member of the Edinburgh Photographic Society and his name is at present on its list of Council. He was also one of the Council of the Photographic Convention, although, owing to his illness, he was unable to attend its meetings.

Imbued with a deep feeling as to the desirableness of having photographs absolutely lasting, he felt a keen interest in all such processes as were characterised by permanence, and in vitro-enamels in particular, in the production of which he ultimately acquired great success. His skill in his avocation as a professional photographer not only brought him fame but substantial emoluments, and on several occasions he has been enabled to indulge his tastes for travel in distant lands, having

visited many parts of the Continent, Egypt, Palestine, and America, a graphic and interesting account of his last trip, that to California and other parts of the United States, having been given to the Edinburgh Society a few years ago.

Within the last two years paralysis attacked his lower extremities and gradually extended upwards. We last saw Mr. Tunny on the occasion of the excursion of the Photographic Convention from Glasgow to Edinburgh, and it was evident then that he was sinking rapidly.

He was buried on Wednesday, and his remains were followed to the grave by a large number of photographic friends, some of whom came from a distance even so far as from London, to render the last tribute of honour to the memory of one who was beloved and esteemed as a straightforward, honest, fearless man.

In consequence of Mr. Tunny's desire that his funeral should be as quiet as possible, only a few invitations were issued. Nevertheless, a large concourse assembled at the grave, among whom were noticed Mr. Forgan (President of the Edinburgh Photographic Society), Dr. Thompson, Mr. and Mrs. Stuart, of Glasgow, Messrs. J. Cox (of Mason & Co.), Henderson (Perth), A. L. Henderson (London), Marshal Wane, Croke, Howie, J. Ross, and others of the Edinburgh photographers, together with members of the Town Council. The coffin was covered with wreaths, noticeably one sent by Mrs. Duncan McLaren, and another from London friends.

ON THINGS IN GENERAL.

If any young photographer were to ask me what was the best reading of a periodical character likely to improve him in photographic knowledge, I should say at once, "Read THE BRITISH JOURNAL OF PHOTOGRAPHY, and pay special attention to the reports of the London and Provincial Photographic Association meetings"—succinct accounts of the speeches of men of mark freely parting with their knowledge to the general fund of information, the amount of practical knowledge thus conveyed is most remarkable. But this very succinctness is, I take it, apt at times to lead to misapprehension. Thus, according to last week's JOURNAL, Mr. England's observation that "to get more vigour with thin negatives he sometimes placed them where they would take a whole day to print, and thereby obtained contrast" was replied to by Mr. W. E. Debenham, who stated that his experience did not support the last statement. Now I feel sure here that the report does not do justice to Mr. Debenham. I believe him to be a large employer whose actual practice is in all probability in the dark room, if he handles his chemicals at all, and not in the printing room; but I shrewdly suspect that he has a practical knowledge of all his processes. Hence, when I read of him apparently denying the benefit to be derived from a mode of practice which I, for example, who have a large personal experience of (in common with most processes) practical printing, look upon as such an undoubted benefit as to be beyond possibility of cavil, I take it the report is too brief to give us the exact meaning of the discussion. Mr. Cowan's suggestion that comparative experiments upon the point should be made was an excellent one to disarm controversy, but I really don't think he believed it necessary to find out whether a weak negative gives a better print in sun or in shade; for that in effect was the condition well within meaning of the discussion when pressed to its ultimate limits.

I recollect, when a boy at school, my tutor telling me about the battle of Waterloo, that all three combatants claimed to have won it. Englishmen believed they in the main won it; the Prussians that they were the sole means of victory; while the French said that they were the victors but the British did not know they were beaten. To apply the simile to a much more modest affair, the writer of the letters over the signature of "A Painter" in falling foul of Mr. Redmond Barrett does not know when he is beaten, but I do not think any one else believes that he has not had a fall. I notice a week or two ago he passes the charge of audacity and hurls it at me. This is most unfortunate for him; he should have kept to his original resolve of silence, for I will quickly show that his charge of audacity is an impertinence only.

I go to see an oil painting and, for reasons to me quite satisfactory, but which I do not detail, I quickly come to the conclusion that the painting of the face is done over a photograph attached to the canvas.

I try to avoid giving my opinion, but the owner presses me and I give it. Observe, I come to a certain conclusion for reasons not given. In years to come one visible proof of the correctness of my conclusion is available, but even had such visible manifestations not been produced how can I be blamed if I do not give the reasoning that dictated my conclusion? I was not writing a treatise on painting. But while the subject is still under discussion we may just hark back to a question bearing on a topic of considerable interest to professional photographers. "An Amateur" asks "A Painter" (I presume a house-painter, from his lack of practical acquaintance with the *technique* of oil painting as used by artists) how oil paintings will become discoloured after the manner I described though no photograph underlie them? I will reply, as "A Painter" cannot. I spoke of the *faces* going black. As the picture was a three-quarter length the hands were presumably included in it as I did not mention them; they were equally presumably not blackened. Now a picture in which the faces by selective preference discoloured, while the hands were all right, would be almost a miracle. Certainly the face might blacken if it were placed over the end of a stovepipe—a position unusual, to say the least—but the factors given by the painter would none of them effect that selective action.

The simplest and most frequent cause of all for blackening of the carnations is not mentioned at all by him. It is simply that oil paintings kept in the dark are very liable to spontaneously discolour, the remedy being to hang them in the light for a time. All that verbiage about second painting in three months' time, and bleaching of oils for five and varnish for ten years, has not the slightest practical value. It is little better than nonsense. Let my readers picture to themselves a varnish-maker starting business and waiting ten years before he sold his wares! Finally, this painter says, "But 'how to restore them,' I must recommend him to consult some works written upon this subject—for example, such as Field's *Chromatography*." I leave this subject by saying that, so far from Field's work being one on picture restoring, it is a work of over four hundred pages, of which one chapter of twenty pages only is devoted to picture cleaning and restoring!

Apròpos of the new Act on merchandise marks, several times referred to lately, it appears to me that all concerned are treating it with such a *cœur léger* as to lead to the impression either that they are ignorant of its provisions, or that they are under the impression that it will be in effect a dead letter. As to the latter, I am in no position to judge, but my idea is that the Bill is one of the most far-reaching character that has been passed for many a long year. When it is considered that the man who sells photographic lenses, or microscopic objectives, or cameras, or dry plates, or collodion, or chemicals—subjects affecting photographers—not to speak of others who sell watches, clothes, shoes, antibilious pills, perambulators, cattle food, hydraulic pumps, and any other equally incongruous articles, and by simply placing his name upon them represents them as his own make, is liable to be sent to gaol if the article be not his own make, there is room to wonder at the calm way in which the Act is looked upon.

Mr. Briginshaw made a pathetic point when he described one of the properties of a roller slide being the power of inducing the photographer who employed it to cut his best exposure exactly into two halves, and every one must pity the artist undergoing such experience. Nevertheless, he did make a point, and one that wants attention being drawn to it. I liked, too, the reference to the perishability of enamel photographs being disproved by a cart-wheel. It reminded me of the photographer years ago who had just received a painted carbon photograph, and who showed it to a lady client. *He*: "This is one of the new process permanent pictures." *She*: "Is it?" and she stroked the face with a damp finger to try the permanency. Tableau!

FREE LANCE.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

THE materials upon which photographs are produced nowadays are, indeed, numerous, and numerous though they be they are daily being added to. An artist, therefore, who wishes to be successful from the point of photographic colouring must be prepared to work upon any base that may be offered to him. The choice in this matter very seldom falls to the artist.

* Continued from page 598.

Of course, the "*principles of painting*" never change, no matter what the substance we may be obliged to work upon, but the treatments as regards the application of the colour must necessarily be greatly influenced by it. Although the *principles* remain the same throughout, our methods of carrying them out must differ very considerably both in their application to the material we are working with as well as in the preparation of the material we intend to work upon.

Photographs intended for painting in water colours are usually printed on one or other of the following materials, especially when the subjects are large, albumenised paper being good enough for the very small work. First comes the *plain salted or arrowroot paper*, once very generally in use; then follows the carbons, Woodburytypes, and platinotypes; collodion transfers; opals, often called porcelains, and ivory. Photographs can be placed upon the ordinary canvas or upon Whatman's drawing-paper. The latest addition to the above is a newly prepared paper, only very recently brought into prominence, which promises to be useful alike to painters in oils as well as water colours. This paper is termed bromo-argento-gelatine paper, and which, I feel sure, has a great future before it.

These materials are generally only used when the most highly-finished work is required, or when the heads to be painted approach at all towards life-size. For all the smaller sizes, and where the highest finish is not essential nor permanency at all an object, albumenised paper is the most usual material used. The surface of albumenised paper has always been a source of trouble to the beginner. There is always a kind of greasiness about it; the colour will not run evenly or easily over it, nor will it dry uniformly; and, as if all these troubles were not sufficient, it adds the facility of coming away, or "licking up," when the brush touches it with a fresh "wash" or application of colour.

There are many ways of preparing the surface—such as a very little ox-gall mixed with warm water, or a regular sizing preparation can be bought which will not only serve the purpose of giving a desirable surface to the albumenised paper, but will facilitate the application of the colouring afterwards, in addition to adding to their natural brilliancy. All preparations of this kind should be applied to the photograph with a good sized *camel-hair* brush, care being taken to spread it evenly over the surface, and then allowed to dry thoroughly. Generally one application of this kind will be sufficient. Mr. Newman has made a preparation which not only prepares the surface, but will allow of a *second* wash of colour being applied without in the least disturbing the first. This, it is not necessary to say, is a very considerable advantage, as it will enable the artist to get a depth and transparency of colour he could not otherwise hope to obtain. It will mix easily with water, and possesses that most important quality of becoming insoluble when dry. The great advantages of this quality must be apparent to any one who has attempted to colour a photograph. There are many advantages attaching to the use of this preparation, one of them being that you can *mix it with the colour* and repeat one wash after another, as they each, when dry, become quite hard. The colourist is therefore enabled to procure a depth and transparence akin to oils, and rivalling them in brilliancy. The brushes used in this treatment should be washed before they can become dry, otherwise they may be considerably injured.

Plain salted or arrowroot paper is a very favourite material for working upon in water colours, as they lend themselves to the treatment. They have a "*tooth*," and receive the colour very kindly. Then it is a very fine drawing-paper, and retains, as such, the qualities requisite for easy colouring. One can almost always work upon this material without any preparation whatever, but occasionally it partakes somewhat of the quality of blotting-paper. Now in such cases it should be washed over with a size. The one mentioned above will answer the purpose, and may be applied as directed for albumenised paper. Sometimes there may be a little trouble in this regard, the paper being unduly absorbent, when a second wash of the size would be advisable before beginning work. This, however, can be easily judged by trying the corner of the paper with a little colour. If it adheres easily and does not sink too much into the surface, it is ready for colouring; if, on the contrary, it is still too absorbent, it will be found advantageous to repeat the application.

Often it will be found to be as well, before starting on the colouring, to gently wash the surface with a brush and a little clean water, and then dry it. This done, it will be ready for colouring, and you can start ahead with your work.

Carbon photographs are, nowadays, "the correct thing" for colouring. They have very many advantages over the ordinary albumenised print, foremost among them being its permanence. This, needless to say, is a very serious consideration when we are selecting a basis whereon to place valuable work. The ordinary albumenised print, unless most carefully washed (not as work is generally turned out nowadays), is a very unsafe base for such a purpose, for no matter how good the work or how skilful the artist who may have painted it, when once the photograph underneath begins to fade the picture is practically lost. There is no way out of such a trouble, as no amount of patching or restoring will stem the tide of destruction once it has set in.

All *carbons*, *Woodburytypes*, or *autotypes* are all photographs bearing a very close resemblance, inasmuch as they have each a gelatine basis. They have generally a smooth, shiny, and non-absorbent surface; some, however, are produced with a dead or matt surface, and also on Whatman's paper, and these are certainly the most preferable. These latter are, however, *special*, and not the ones most likely to be handed to you by the photographer for colouring. I have not worked upon many Woodburytypes, and I may here say that I have no particular desire to do so.

The *platinotype* process produces, to my mind, very beautiful results. The surface is very pleasant to work upon and takes the colour very satisfactorily, but, all things considered, they are best for working up in monochrome. There is a certain coldness of tone pervading all platinotypes, which, however beautiful it may be in itself, must necessarily make them objectionable from the point of painting in water colours. Of course, for oils it is much less material than in water colours, as the black shadows can be so much more easily obliterated. It is very difficult to get life and warmth into the shadows, they are so cold and black. Of course it can be done, but it will entail considerable labour on the artist, and in most cases force him to the doubtful expedient of using body colours. This would be more or less a misfortune. Of course everybody has an *opinion* on this subject, and some stronger than others. Personally, I must say I prefer *pure colouring*, and as transparent as is possibly consistent with the painting of a picture, to the wholesale or even preponderant use of opaque or body colours. I have seen some very fine examples of both kinds of water-colour painting, as regards portraiture, and on them have based my own opinion. The paintings which recur to me while I write these lines I saw in Paris some years back, and were painted for M. Nadar, père. I have never since seen their equal. They were life-size, head and shoulders, but they really looked *alive*. There was one of M. Nadar himself, and any one coming hastily into the studio would think the living man and not the picture stood before them. M. Nadar, too, was a most difficult subject to treat with anything like success.

Although rather unfavourable for water-colour painting, as I said before, they are admirably adapted for working up in monochrome; they are so cool in tone and so grateful to the eye. If, however, you are obliged to paint on them, or even finish *very highly* in monochrome, I would recommend the passing of a "sizing preparation," such as I before mentioned, over the entire surface before applying any *colour*. Although platinotypes have a good surface for working upon, the paper is somewhat *too* absorbent for water colours without the application of a sizing preparation of some kind or another. But this done there is nothing more required to produce a perfect result in either direction but ability. It would be a great boon if this, like the "sizing preparation," could be bought in a bottle.

Porcelain, opal, or pot metal.—For the best class of water-colour painting and working in monochrome (up to a certain size) this material is quite the favourite of the present day. There are two kinds of it, smooth and plain. The former possesses the necessary qualities for working almost without further preparation, but for the latter the photograph must be taken on a collodion film; it is then varnished with a matt varnish, which imparts an absorbent surface to the picture as though it had been ground or smoothed by hand. A great quality with these porcelain pictures is the purity of the whites,

This alone will ensure brilliancy when placed in skilful hands, and give every facility for *pure* colouring.

Collodion transfers are almost entirely used for finishing in oils. They are simply collodion films transferred to paper. I have no doubt that all the readers of the JOURNAL have seen some very dreadful examples of this class of work. I also feel sure that very few of them will ever aspire to practise this particular line of photographic colouring.

Ivory is also a basis both for carbon and collodion photographs. In some cases the photograph is printed direct upon the ivory, but generally there is a carbon film placed upon it, as in the case of the porcelains. It is something difficult to secure the pureness and transparency of the plain ivory, but it can be very nearly arrived at by printing in red and rubbing down until you get the desired effect. Should the surface work at all greasy, give the entire surface a wash of weak ox-gall.

The *bromo-argento-gelatine paper* is a material only recently come into prominence, and is more generally used for finishing in oils rather than water colours. When used for water colour a sizing would be advisable.

Photographs are also made on *canvas*, drawing-paper, and, I may say, almost any material of suitable colour can be used as a base for a photograph.

REDMOND BARRETT.

(To be continued.)

SUPERIOR WORKMANSHIP.

THE letter of "H. A. S.," under the above heading, in a recent issue, does not appear to have elicited any information as to whether the experiences of that gentleman's brother amateurs, "of what is advertised as 'superior workmanship,' runs upon all fours with" his. This is rather strange, such complaints being common, *vidé voce*, just now. One would have thought that the opportunity of ventilating a grievance of this nature would have been readily seized by many who, like "H. A. S.," have no redress but the discreetly curtailed publicity of a professional journal. They appear, however, to prefer suffering in silence, which is philosophical, but not calculated to mend their wrongs.

One can sympathise with "H. A. S." in being cursed with such slides as he describes. At the same time, he must admit that some portion of the blame should be awarded to himself; for an amateur who has satisfactorily worked a certain camera for several years, and then "in an evil moment," for the sake of a few ounces in weight, exchanges it for one of which he knows absolutely nothing, can have less cause for surprise than disgust if he meets with the annoying experiences detailed by "H. A. S." If I were Mr. Hare I should say, "Serve you right." But there's a providence in all things, and "H. A. S." has learned a useful lesson, at a handsome price. In an article entitled, *The Camera in the Field*, that appeared herein on August 26, I devoted a few critical lines to these "much advertised light cameras," and I stated "that actual experience proves that for every ten men who could make a good camera not one turns out a reliable dark slide." The letter of "H. A. S." bears out that statement, point for point, with singular emphasis. I did not think I should so soon have such a splendid confirmation of what, to the uninitiated, must appear almost paradoxical, and I hope I may be pardoned for metaphorically shaking hands with myself.

The war in these pages between the old style of camera and the new must, I suppose, of necessity be decided without editorial intervention. Neither "H. A. S." nor anybody else would, I opine, desire to cast the mantle of Photographic Mentor to all and sundry on the heavily burdened shoulders of the present occupant of the Chair. If such were done life in York-street would be simply frightful. Still "H. A. S." and his brother amateurs need not be victimised with their eyes shut. I trust few are so unwise as to remit for such an important article as a camera, whose acquaintance they only make through the advertisements—from which even manufacturers themselves allow us to deduct a good discount. It is unfair to vendor as well as purchaser. This was the second mistake of "H. A. S." (the first being the exchange of an old lamp for a new one); the third was that he did not test the camera and slides before going abroad. He should have inspected them before purchasing, or got a friend or a dealer to do so for him. "H. A. S." seems to have been at fault all through, and it is to be hoped that others will be warned by his mistakes.

Everybody admires these light cameras, but their ingenuity is wasted and their extreme portability and lightness are only arrived

at after a deplorable sacrifice of strength and simplicity of construction. That they are durable remains to be proved. "H. A. S." confesses to have had his Hare several years. I take leave to doubt whether any one of the light brigade will ever earn such praise. Reiterating the opinions expressed in the before-mentioned article, I question the practical efficacy of many of the new movements; I deny that any number of so-called improvements, patented or otherwise, compensate in any degree for the most trifling fault in construction, and I refuse to believe that a trustworthy instrument can be made by machinery. In short, I maintain that the form of camera of which that alluded to by "H. A. S." is the accepted type, is, with the single exception of lightness, in all practical respects the equal, and in many the superior, of all the race of what "H. A. S." designates the "much advertised light cameras." Amateurs who contemplate deserting a camera that has served them well for several years—as in the case of "H. A. S."—should look before they leap. That gentleman did not; hence his bad fall.

MANSTON MOORE.

RECOLLECTIONS OF EARLY DAYS IN PHOTOGRAPHY. II.

THE photographic studios very soon became numerous and caused a great stir among the trades that attempted to supply the increasing demands for frames, &c., and among the manufacturing opticians who undertook to produce lenses that would make sharp pictures and reduce the time of exposure. These difficulties were not overcome so long as the Daguerreotype held its sway. The glass used in making the lenses was partly of flint and partly of crown, and the method of obtaining the specific gravity of glasses was at that time unknown to the ordinary working optician.

Would it be out of place to cite an accident which occurred to a manufacturer of object lenses for opera glasses in Paris about this time? He was very neat and particular in his grinding and always turned out the best quality of opera glasses. I employed him to make for me, as a venture, one dozen quarter portrait lenses, double combination, which he thought he could do as he happened at that time to have a stock of both crown and flint glasses perfectly adapted for this purpose.

He soon made twelve of these instruments, that could not be surpassed for quickness and sharp definition. I sold them without trouble, and thereafter continued to give my increasing orders. The price I placed upon these lenses was twenty shillings each, and Andrew Ross, hearing from others of this extraordinarily cheap and good lens, obtained one from me and was quite surprised to find that the lens was all that was claimed for it. I had sold, up to this time, about one hundred of these lenses and was continuing to give my orders for them in large quantities. A batch soon arrived from Paris, however, and was tested (as every lot of lenses was before being placed upon the market), and to my surprise they were found to be greatly inferior in quality to those which I had previously had from this glass grinder. I wrote to my friend and found that a great accident had happened in his shop. He kept his glasses in two cupboards; one containing all of the discs for my quarter lenses, and the other the lenses for his opera glasses. An apprentice, who had been ordered to dust each cupboard, had gone beyond his order and taken the lenses from the two cupboards, and in the confusion of dusting had mixed them, so that when the workmen, who were ignorant of the density of glasses, attempted to make the combination they used the discs recklessly, just as they happened to come, without regard to their specific gravity or other differences. The result was that I could obtain no more correctly made lenses until he had obtained from a scientific optician the specific gravity of the mixed discs and had them placed in their proper cupboards again.

Scientific opticians were not numerous at that time, and when, in 1851, the great Universal Exhibition was held in London, I introduced M. Buron, of Paris, to Andrew Ross; but M. Buron could not speak English, nor could Ross, French. Soon after M. Buron took a pencil and presented to Ross a paper with some geometrical curves and lines with explanatory algebraic letters inscribed thereon, which Ross seemed to understand and answered by another with similar curves and lines. Both seem pleased; but I do not know to this day what those hieroglyphic marks indicated to those two men.

Some three months after the Great Exhibition of 1851 was opened, an old acquaintance, a lithographic artist of Paris, sent to the Exhibition about four photographs on paper, printed from glass negatives of about $8\frac{1}{2} \times 6\frac{1}{2}$ in dimensions. These were the only paper negatives in the entire Exhibition, and public curiosity was naturally aroused at their appearance.

Public curiosity was again excited by the first stereoscopic pictures

taken from natural objects by the clever Parisian optician, Dubosc. Sir Charles Wheatstone, the inventor of the stereoscope, which in form resembled the graphoscope, was a customer of mine some years before he died. He came to my house a few weeks before he went to France, and complained to me that his invention of the stereoscope had not been done justice to by the firm to whom he had entrusted the model. He said he had also invented something nearly allied to the stereoscope, but which showed a most pleasing and amusing optical illusion. When he returned from France, he said, he would reveal the secret to me, and bring it before the public; but, unfortunately, he never came back to England.

Dubosc invented the general form of the stereoscope as now used, but he did not benefit himself by the invention. He was the first to show that small-sized photographs could be enlarged, and I was shown by him the first enlarged photograph which he had made from a small glass image—the light used coming from an electric lamp of his own invention. The Exhibition closed to the public, and only purchasers of goods from the Exhibition when it was opened, and the owners and packers of goods, admitted. Dubosc sent to an agent in the palace stereoscopic pictures taken from natural objects on Daguerreotype plates. I was the first to whom the pictures and stereoscopes were shown, and I agreed to take all that he received at six francs each, and also pay for the stereoscopes. The agent tacitly agreed to sell all to me. Prince Albert visited the Exhibition daily, and the agent showed him the pictures. The agent did not keep his agreement with me, but sold the pictures and stereoscopes to the Prince and Queen.

But I soon found a very clever Daguerreotype artist named Laroche, of Oxford-street, London, for whom I purchased statues and other plaster of Paris objects, which he reproduced for me in stereoscopic slides. He soon became very clever in stereoscopic portraiture, and I have now two coloured portraits quite free from any fading and very artistic, which were made by him at that time by the stereoscopic process.

Laroche became quite prominent in Daguerreotype portraiture, and his ambition urged him to produce portraits by photography on collodionised glass. Talbot opposed his productions because they infringed his patent, and a meeting was called to aid Laroche in his opposition of Talbot; but the final verdict was partially in favour of Talbot. The public, however, was so strongly opposed to Talbot that he was obliged to yield to its opinion, and soon gave up all his rights to the public.

At that period the lenses which were in highest favour were those made by Voigtlander, although these lenses never gave correct images because the chemical and optical rays were not coincident. The eminent optician, Andrew Ross, soon used his knowledge to produce lenses perfect in this respect. Soon after, a young German, Dallmeyer, entered the employ of Ross, ultimately marrying his daughter, and, after the death of Ross, was taken in as partner of Thos. Ross, son of Andrew Ross. The two, however, soon quarrelled, and a separation of the firm took place.

In 1848 another great discovery in photography excited public curiosity. Schoenbein had made a very explosive compound from the innocent article of cotton wool. It was claimed that warfare would be entirely changed through this invention, but then a man named Maynard, of Boston, dissolved the gun cotton with ether and spirits of wine into a liquid jelly, and when dry the particles were found to be very valuable for surgical use in covering wounds. M. Le Gray, of Paris, a rising and clever photographer, gave it as his public opinion that this substance could be made serviceable for photographic purposes.

In the month of February, 1851, F. S. Archer, of London, first published in *Notes and Queries* that he had sensitised collodion, and had succeeded in pouring it upon glass on which he could make pictures. This new advance in photographic manipulation was at first scarcely successful in attracting photographers, who then, as now, were very slow in adopting new methods, however improved or worthy of acceptance they might be. Soon, however, the tide began to flow in the direction of collodionised glass plates.

In the year 1853, on my return journey from Scotland, I stopped at Newcastle-on-Tyne, and called on Mawson, a druggist, who had commenced supplying photographers with requisite materials, and among other articles I showed him a student's microscope. A young chemist, at that time an assistant to Mawson, showed him, by the aid of this microscope, the structure of collodion. Thomas, a druggist of Pall Mall, London, was one of the first who followed Archer in the manufacture and sale of collodion, and it was generally reported that Professor Pepper, a clever lecturer of the London Polytechnic Institute, gave the best method for producing a good-working collodion that immediately rose in reputation, and realised for Thomas a large

fortune. Mawson took into partnership his young chemist, Mr. Swan, and the firm of Mawson & Swan became the largest manufacturers of collodion in the world.

The London King's College had a most excellent professor of chemistry, Rev. S. T. Hardwich, who was a very ardent lover of photography. He published many excellent notes on any new discovery that aided in producing photographic pictures. In this he emulated the example of Hunt, of Cornwall, who was the founder, I believe, of the Falmouth Technical Institute, and who encouraged in every way the growth of photographic knowledge. Unfortunately for photography and science in general, Mr. Hardwich entered the Church, and is at present one of the hardest workers in Durham county.

Thomas Sutton, editor of *Photographic Notes*, followed Hardwich as professor of chemistry at the college for some short period. Sutton was a personal friend of mine, and we passed many agreeable hours together. He was most virulent when writing in opposition to an assailant, but in conversation one of the most attractive men one could meet, and was ever ready to help any photographer out of a difficulty. He was the inventor of the panoramic lens. Thos. Ross manufactured the lenses and cameras, and the pictures were good, but the dark slides were made to hold bent glasses. This difficulty stopped its success. Sutton lived in the Island of Jersey, from where he issued his journal, *Photographic Notes*. I will now relate the difficulty which the changes in photographic manipulation occasioned Daguerreotype artists in India and other colonies of Great Britain.

My friend, Frederick York, the eminent photographer, lived at the Cape of Good Hope. He was by trade a chemist and druggist, and went to the Cape of Good Hope to become its chief Daguerreotype artist, but when the change obliged him to adopt the collodion process he obtained, with great difficulty, the necessary chemicals. In 1854 he was obliged to redistil ether from an acid article imported from Holland—being only used for medicinal purposes—that, when it was made into collodion and iodised, it turned the colour of the collodion to that of port wine. Spirit of wine had to be redistilled also from a Cape brandy called Cape Smoke. Iodide of ammonium and pyroxyline he had to make also. All these difficulties placed in contrast to the present easy way by which photographers produce their pictures, emphasises both conditions by the contrast. Another great difficulty in collodion pictures in the colonies was that no ship would convey collodion on account of its easy combustion, so that collodion was only accepted by certain ships which carried gunpowder. Some ships took collodion as deck cargo, and on the most trifling accident occurring, the whole cargo was thrown overboard. J. SOLOMON.

(To be continued.)

LANDSCAPE: CHOICE OF SUBJECT.

A GREAT deal has been claimed for the extraordinary range of art, "from the hues of a cabbage leaf to the sufferings of a Christ." "Nay, there is nothing that man has ever dreamed, or hoped, or feared, suffered, enjoyed, or sinned in, which is not a subject matter for art," says Mr. Quilter, one of the most acute art critics of our time. But all who practise art must appreciate the limitations of the particular department of art which they practise. The painter in oils has the widest range, and an almost unlimited choice of subjects; the water colourist has a narrower scope, so also has the sculptor; but shall I be wide of the mark when I say it is left for the photographer to show the greatest ingenuity in the choice of subjects in which to show his skill as an artist? The photographer should try to understand, and be satisfied with, the limitations with which he is "cribbed, cabled, and confined," and endeavour to turn them to his use, or rather find in the very limitations a certain fitness and use, because it clears away a vast number of impossible subjects, confines his study in a narrower groove, and enables him to give more complete attention to "the things that are his." Do you get a glimmer of my meaning?

We are in the habit of claiming for photography an unlimited range of subjects, from the infinitely little to the infinitely remote; from the microscopic diatom dredged up from the depths of the ocean to the infinitely remote nebulae in star-packed space; but there are some things that may be possible which are yet unaccomplished. We may say we have no more worlds to conquer, but we talk like Alnascher.

In landscape photography, which is our present subject, there are one or two things that have not been done. For instance, have you ever seen a photograph in which one very common fact in nature is adequately represented? I mean the effect of storm and wind on an island landscape. I say island, because such effects are easy in sea pictures. The effect often seen in pictures by Salvator Rosa and

Gasper Poussin. The bending and swaying branches of the trees, the driven sky and the fluttering garments of the figures. The effect of wind is, unfortunately, too often to be found in photographs, always to the disfigurement of the picture, but no "lightning" or "special instantaneous" plate has yet been made that would enable us to do justice to the grand and pictorially fit effects I have suggested.

Then, again, I have never seen a photograph that gave me any proper idea of a mountain. Photographs of the Alps always remind me of toy mountains, and I want to see a child's Noah's Ark on the highest peaks. Perhaps it is because we nowadays make such fun of what were once inaccessible solitudes. We go up Ararat on a bicycle instead of waiting for the orthodox flood, as Noah did.

There is another effect that has never been quite properly captured. In a mountainous country when the sun has set to the observer it still shines on the mountains. The effect is often one of the most beautiful in nature, but the non-actinic colour of the sun's rays at that time of the evening has hitherto prevented anything like success in photographing this subject. As Milton says:

"Yet from these flames
No light, but rather darkness visible."

However, this is a difficulty that may soon be added to the many conquered in the past. Orthochromatic plates will solve this problem, and when you have obtained a really fine example of the effect, here is a title for it (there is a good deal in a title) from Tennyson's new *Locksley Hall*, but make the pictures worthy of the line:

"Cold upon the dead volcano sleeps the gleam of dying day."

This reminds me of another important thing. Never give your picture a title it cannot support. I like good titles. I don't mind even if there is a bit of sentiment, so that it is healthy in them, and the boundary between the sublime and the ridiculous be not overstepped, but beware of anything in the nature of an anti-climax. If you have a picture in an exhibition and the spectator, before seeing your poor little work, reads an ultra-poetical title, with perhaps a verse attached to it in the catalogue, his expectations will be so raised that when he sees the picture he may feel a cold fit of disillusionising pathos come over him that he may remember against you for some time.

While I am talking of titles I may just add an illustration of how it is possible to go wrong in naming even the simplest subjects. I am told that the cows in the photographs of which I gave a reduction in my last letter were not cows at all, but are what are called in Scotland "stirks." I am quite aware that the natives of that far country, with an independence which is perhaps praiseworthy but slightly puzzling, call things by names beyond the comprehension of other parts of the world, yet I believe I am almost wrong in calling these animals cows. Some of them may attain the dignity of cowhood just as some girls become women.

Now for subjects that are possible.

It is a true saying that each student must discover for himself what is beautiful. It is not every kind of scene that appeals to the feelings of all alike. Some of us delight in particular kinds of landscapes, some like grandeur, others are content with quiet simplicity. "Each of us is constituted," writes Mr. Hamerton, with, perhaps, not a few verbal impediments, "with a special idiosyncrasy related in some mysterious way to a certain class of natural scenery, and when we find ourselves in a scene answering to our idiosyncrasy, the mind feels itself at home there, and rapidly attaches itself by affection."

The student may be guided in his search for beauty, but it is not wise in a teacher to persist too strongly on what is picturesque or the reverse. Many painters will make good pictures out of subjects which would seem to be quite inadequate to others. Many of the greatest landscapes are of the most ordinary scenes. What could be more commonplace than the scenery of Gainsborough's *Market Cart*, Turner's *Frosty Morning*, or any of the pictures by De Wint and David Cox?

—*Photographic Times*.

H. P. ROBINSON.

FILM NEGATIVES.

[A Communication to the Birmingham Photographic Society.]

HAVING had a certain measure of success with Eastman stripping films, I have been requested by your Council to give a paper this evening dealing with the subject, and particularly with the method of working which my experience has found most successful. In according to their request I feel I have imposed upon myself a somewhat difficult task.

There is, undoubtedly, a strong prejudice in the minds of most photographers, both amateur and professional, against a negative in which paper is used as a permanent support, on account of the in-

separable "grain" and lack of brilliancy in the resulting prints, and the idea of the paper being used only as a temporary support does not seem to convey to their mind a correct impression of the true position of the matter.

It may be as well before entering into the technical details of the manipulation to consider briefly the advantages to be derived—which will be better appreciated after an actual trial.

My experience (which is at present limited) is that they are far superior to glass for all purposes except portraiture of the human form or instantaneous pictures where extreme rapidity is necessary, but for all ordinary cases of rapid exposure they are sufficiently quick. The first advantage, which I soon discovered, is their entire freedom from halation. This with glass plates is inseparable, and even when much labour has been bestowed on backing them the halation is painfully apparent.

These films never frill, being made of emulsion which has been made insoluble. Compare the respective weights of the two substances—one plate weighing more than a dozen films of the same size.

Again, on comparing a stripping film negative with one on glass of the same exposure and subject, it will be found there is a greater sharpness or clearness in the detail owing, I am of opinion, to the paper absorbing the light immediately it has penetrated the emulsion, the result being a brilliant negative. Landscapes on stripped films can be retouched or printed from on either side, and the advantage in this respect for carbon or mechanical printing is enormous.

Now imagine the tourist working with glass, and compare him to another working with films. The one works in harness, tugging, probably, a half-hundredweight of glass with him from place to place, paying extra carriage, extra tips, and in a continual state of anxiety as to possible breakage, difficulty of packing, and having to be continually on the look out for a dark place to change the plates, and, perhaps, on his return finds numbers of his plates damaged owing to friction on the surface; while the disciple of *films*, lightly burdened with only camera and slide, and his (say, 200) films in his pockets, for they lie so compact together. Then the advantages to the tourists abroad their name is "legion," not the least being the ease of guarding your exposed pictures from the custom-house officials, who almost always seek to make matters disagreeable in this respect; and lastly, though not least, the ease with which the negatives can be stowed away in envelopes or albums, &c., when reference to them is easy in the extreme.

Now, having come (rightly, I think, you will admit) to the conclusion that films have these advantages, you naturally ask, What are its disadvantages? Remembering, then, that I am only advocating stripping films, I consider they have but two disadvantages:—1st, They entail some additional outlay in the way of apparatus, &c. 2nd, They are a little more trouble to finish than the glass negatives, which sink into insignificance when the manifold advantages are considered.

I will now show how I work the roller slide (Eastman I use and prefer), and also note the indicator I have had made by Mr. Place, showing the exact position of the paper before and after exposure. My friend (J. H. Pickard) has fixed one on his slide which shows in addition the number of films exposed (automatically). I also show here the film carriers for the cut sheets. A substitute for these can be made of a piece of thin wood, and springing this strip in your dark slide over the paper and exposing in the usual way. The cut sheets can be used also in Pumphrey's and other changing slides. There is one fault, if it may be called a fault, for it lies more at the door of the operator and not the films or slides, viz., the number of exposures. Surely there is no necessity to expose twenty-four films in an hour or so because you have the power to do so.

In order to deal effectively with the second objection I mentioned, viz., the extra trouble and perseverance, I propose, with your permission, to carry a negative through the different stages from exposure to completion, and in so doing I shall endeavour to make the process clear to you, and hope to enlist your attention.

The developer I use is slightly different to that of the Eastman Company, and is as follows:—

A.

- Sulphito of soda 4 ounces.
- To be dissolved in 8 ounces of hot distilled water, then rendered slightly acid with citric acid, then add—
- Pyrogallic acid 1 ounce.
- Water to make up to 10 ounces.

B.

- Pure carbonate of soda 1 ounce.
- Water to make up in all to 10 ounces.

C.
Pure carbonate of potash 1 ounce.
Water to make up to 10 ounces.

D.
Bromide of potassium 1 ounce.
Water to make up to 10 ounces.

I have here two half-plate films exposed at 8.30 a.m. to-day, one with five and one with six seconds exposure, subject chiefly middle distance. I take 90 minims A, 10 minims D, and 90 minims B, and make up to 2 ounces water. I do not soak the films in water. There is no need for it; in fact, it is prejudicial to do so. I place the films face uppermost in the dish, and pour on the developer on the centre of the films. You will observe they lie perfectly flat, and are free from air bubbles. Rock the dish continually during development, and when the high lights are out add from 10 to 90 minims C, and finish development and fix. The negatives being complete, I ask you to observe that both are of equal quality, proving the latitude of exposure permissible.

I now coat a piece of glass half an inch larger all round than the negative with indiarubber solution (see Eastman formula) and squeegee the negative face downwards upon the rubber, interposing a sheet of blotting-paper and oilskin between the negative and squeegee to prevent injury to the exposed rubber surface, and then place the negative under pressure with blotting-paper interposed until moderately dry only.

I then pour hot water upon it, and gently rocking the dish you see the paper floats from the film without the necessity for pulling it with a pin, leaving the film negative on the glass. Now the instructions say remove the remaining soluble gelatine with camel-hair brush, but unless it requires intensifying, which no properly developed negative should require, you need not do so, but simply pour on the gelatine solution (see Eastman formula), well covering the edges of the film, and put on a level shelf to dry.

I will now take up a negative in this state on the glass, but dry, and carefully cut round the edges of the film, and you see I can readily pull off the film with its gelatine support. Having now passed through the whole of the process it behoves us to consider for a few minutes the causes of failure in the hands of beginners and their remedies. 1. The rubber will not flow over glass?—Solution too thick, glass greasy. 2. Rubber peels off on drying?—Dirty glass. 3. Negative not dense enough?—Use more bromide and longer development. 4. Gelatine cracks on being pulled off?—Add more glycerine. 5. Gelatine not thick enough?—Gelatine varnish too thin, not strong enough. 6. Does not dry sufficiently hard?—Too much glycerine.

E. H. JAKUES.

ON THE FADING OF SILVER PHOTOGRAPHS.

III.

We have already seen (page 553) how sulphur or sulphurous compounds may be communicated to and left in the silver prints during the ordinary course of their preparation. It is not my purpose to enter into details as to the best means of avoiding these pitfalls in practice, inasmuch as the principles which should guide the operator are now so well known, or ought to be, that any shortcomings in this respect must be discredited to sheer ignorance or culpable laziness. When any doubt exists as to the thorough washing of a batch of prints, a very delicate and easily applied test should always be called into requisition. This test is iodide of starch, made by adding a few drops of tincture of iodine to a thin solution of starch; sufficient iodine being added to confer an intensely blue colour. This test solution will keep in good condition for a long time if some camphor dissolved in alcohol be mixed with it. When the prints are supposed to be thoroughly washed, take a few of them from the last washing water and collect the last drops of the drainage from them in a clean test-tube, a similar tube being filled to the same height with fresh water from the same tap. Now add to each, say, two drops of the iodide solution, and watch the result. If the colour in the tube containing the print droppings is discharged or lessened in depth when compared with the other, the hyposulphite has not been completely removed from the prints. This is a very delicate test, and one which, I think, ought always to be applied.

Indeed, so far as the preparation of a silver print is concerned, the complete elimination of sulphurous or other injurious and soluble compounds is entirely within the photographer's power, with only one exception, and that is the existence of deleterious substances in the unsensitized paper with which he has to operate. Here he is at the mercy of the paper maker and the albumeniser. With respect to the latter, I need hardly say that the article supplied by him should never

have been tainted by decomposition, else a sulphurous silver compound, with the liberation of acid, is the inevitable result as soon as the albuminous surface comes in contact with the sensitising bath.

The next danger that the silver print has to encounter is in the mounting. If the mounting boards are suspected of containing a trace of the anti-chlor hypo, a portion of one should be macerated in pure water and some of the supernatant water tested with a drop or two of the usual iodo-starch solution, just as was previously recommended for the washed prints. I have not had occasion lately to test the modern mounting boards, but I know that some years ago many of them, especially the larger sizes, contained more than traces of hypo, so much so that "look to your mounting boards" became a cry of warning among photographers.

The next danger arises from the nature of the mountant or adhesive material used in attaching the prints to their final support. Starch paste is frequently employed for this purpose. The great objections to its use are its tendency to turn acid when the prints are exposed to a damp atmosphere and also to generate the starch fungus which, when once originated, overspreads the whole surface and is fatal to the prints.

Common glue contains many injurious impurities, and, although frequently employed as a mountant, is certainly open to grave objections. The finer kinds of gelatine may, probably, be used with impunity if, in the presence of moisture, they can be preserved from decomposition, still it is doubtful whether a slight decomposition would exercise any baneful influence, unless sulphur or acid be liberated.

But, of all mountants, I must give the preference to the best white gum arabic. A solution of this, of the proper consistency for mounting, is colourless, possesses great adhesive properties, may, by the addition of a little camphor, be kept fresh for a very long time, and is not liable to decompose, but, should it undergo change, it liberates neither free acid, sulphur, nor anything detrimental to a silver print. These, in my opinion, are advantages which should recommend its general adoption, even although its price (5s. per lb.) may, at first glance, seem a deterrent.*

Yet, when we consider the immense number of photographs which a pound of this gum would attach to their mounts, the additional cost of each mounted photograph would only be the fraction of a farthing. I am the more impressed with the importance of giving great attention to the securing of an inert mountant from the fact that, in the course of last autumn, I had occasion to examine very closely some photographs executed by Talbot in 1845. These were cemented to the mount only for about an inch along the edges. The portions of the pictures over the cement had almost entirely faded away, while the uncemented portions retained almost their pristine vigour.

I shall now conclude this short series of articles with a summary of what I consider the essential conditions required for the utmost longevity of auro-argentic photographs:—1st. That the photograph itself and its supporting medium should contain neither sulphur nor easily decomposed sulphur compounds. 2nd. That they should contain no free acid, nor any substance liable to generate it. 3rd. Silver prints should, when practicable, be kept in dry positions and protected from the action of impure air.

With respect to the latter point, I know of no easier and more efficient plan of securing this end than that fully described in a recent editorial article in this JOURNAL (page 561). The only improvement I would suggest on the method there described, would be to finally squeegee the back of the print with a solution of alum which would render the paper, to a great extent if not altogether, waterproof, and thus enable the print to resist successfully the influence of any noxious substances which may exist in the place of storage.

GEORGE DAWSON, M.A., PH.D.

THE ECONOMICAL PRODUCTION OF OXYGEN.

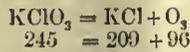
WHETHER there would be a large market for oxygen for use in industrial operations could it be supplied at a reasonable rate, is a question upon which a long debate might be raised; still it cannot be open to doubt that for many small operations it would find extensive

* Some difficulty may be experienced in obtaining the genuine article. The sample I have been testing was obtained from the firm of H. Cooper & Co., 24, Greek-street, Soho, London. It was made up into paste by a formula kindly furnished me by Mr. Ayers, who invariably uses it in his own practice. He showed me some of his stock, which had been kept in the fluid state for more than two years, and which still retained its good qualities unimpaired. The following is his formula:—

The best white gum arabic is dissolved in water sufficient to make a mucilage of the proper consistency. To this are added one ounce of lump sugar for every four ounces of gum used, and also a piece of camphor, both being anti-septics. The sugar also has the property of rendering the gum tougher and more elastic when dry. Gum contains no sulphur.

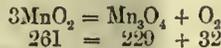
application. In a future article we shall endeavour to enumerate some of the uses to which a cheap supply of oxygen could be put, and from which it will be easy to see that the ordinary processes at present followed in laboratories are altogether out of the question.

The method usually followed for oxygen preparation in the laboratory, and even for oxyhydrogen work at theatres and the like, is to heat a mixture of chlorate of potash and peroxide of manganese, by which means oxygen is given off from the chlorate, the manganese remaining practically unchanged. The decomposition may be shown by the following formula:—



1000 cubic feet of pure oxygen weighs 89 lbs., so that allowing for manufacturing losses, 1000 cubic feet of oxygen would be produced from 245 lbs. of chlorate of potash, which would not cost the user less than 7d. per lb. at his works, making the cost of 1000 cubic feet of oxygen about 7l. 3s. Of course we should have the chloride of potassium remaining as a by-product, but this, even when refined to a white marketable salt, would not be worth more than 18s., the total amount of which would be swallowed up in the fuel, wages, and plant account. It will thus be seen that the industrial production of oxygen from chlorate of potash is, on account of its cost, practically impossible.

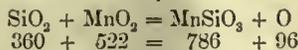
The next process by which oxygen has been prepared is by heating ordinary native peroxide of manganese, when the following decomposition takes place:—



Or, in other words, supposing the decomposition to be complete, which it never is, it would require half a ton of 70 per cent. manganese to produce 1000 cubic feet of oxygen.

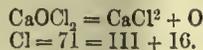
By reference to our prices current, this quantity of 70 per cent. manganese would not cost less than 25s., so that it becomes necessary to recover the manganese if there is any life at all in the process.

In order to increase the yield of oxygen from peroxide of manganese, and to enable the decomposition to take place at a lower temperature, it has been proposed to mix silica with it, when the following reaction is stated to take place:—



That is to say, it would take 7 cwt. of 70 per cent. manganese to produce 1000 cubic feet of oxygen, costing for raw material alone 17s. 6d. It is very probable, however, that this reaction would not take place so readily as the equation indicates, and the utilisation of the manganese silicate would perhaps not be so easy after all.

Another process has been much praised, but we believe it has never been put into general use, though patented by Kirkpatrick on May 6, 1870, No. 1300. By this method a strong solution of bleaching powder is treated with about three parts to the thousand of hydrated peroxide of cobalt, or of a cobalt solution; this determines the decomposition of the bleaching powder into oxygen and chloride of calcium, thus—



From this it will be seen that this process is more expensive than any, save that of the decomposition of chlorate of potash. It would require 1200 lbs. of bleaching powder of 35 per cent. to produce 1000 cubic feet of oxygen by this process, which would cost at the present price at least 80s., besides which the cost of manufacture would have to be reckoned in, as no by-product of sufficient importance is utilisable, and a certain working loss of cobalt preparations would inevitably occur.

Of the whole of the foregoing processes, that of simply heating peroxide of manganese seems the most hopeful, as if the same price could be realised for the manganese-manganic oxide (Mn_3O_4) as is paid for the peroxide, the cost per 1000 cubic feet of oxygen could be very materially reduced, and probably sold at a profit at 4s. per 1000 cubic feet, or one halfpenny per pound.

Another process which has tempted many is the electrolysis of water. The cheapness of the raw material has been the attraction, but up to the present time no headway has been made with the process.

Such advances have now, however, been made in plating dynamos, and they have been sufficiently long introduced into practice to enable us to form a very good estimate of what the cost of oxygen would be if manufactured by their aid.

A dynamo to deposit two tons of copper per 144 hours costs about 250l. This requires a 30-h.p. engine to drive it, say, with boiler, &c.,

another 400l. This boiler would require at least two tons of good coal per day. One man by day and another by night might possibly do all the work required. This machinery then would produce not more than half a ton of oxygen weekly, or about 12,000 cubic feet, so that the expenses would be:—

Coal, 12 tons at 8s.	96	0
Interest, &c., at 10 per cent. on 650l.	25	0
Wages	60	0
	<hr/>	
	181	0

As only 12,000 cubic feet of oxygen could be produced, the cost will not be less than 15s. 1d. per 1000 cubic feet.

Recapitulating, we find that the various methods we have described may be as follows:—

	Per 1000 cubic feet.
From chlorate of potash	£7 3 0
From bleaching powder	4 0 0
By electrolysis	0 15 1
By silica and manganese	0 5 0
From manganese alone	0 4 0

The last two instances are supposing that a sale is made of the residual oxide of manganese at a price equal to the peroxide purchased.

—*Chemical Trade Journal.*

AUTO-STEREOTYPIC PRINTING.

A NEW process of auto-stereotypic printing, especially adapted for the reproduction of books and engravings, has lately been invented in Switzerland, and is already used with advantage at the establishment of Orell, Fussli, & Co., at Zurich, a printing office of European fame.

The process will cheapen the reprinting of the works of foreign authors, which is done considerably here in this country. By this method the type setting and copying of engravings is saved, and an accurate stereotyped plate is obtained directly from the original. It is a transfer process, and for the reproduction two newly printed copies of the publication to be reproduced are necessary to insure complete success. It is done in the following manner:—Plaster of Paris, best quality, is mixed with water to make it a thin putty without lumps, and to this a little alum or salt is added to make it set quickly. To every five pounds of the plaster are then added:—

Silicate of potash or silicate of soda	3 ounces.
Phosphate of lime	2 "

The mixture thus obtained is then put upon a perfectly level piece of plate glass of the desired size, around which iron rods are placed, and left to get hard. The plaster cast ought to be at least type high, to prevent breakage. While the mass is setting, the back ought to be scraped level, and should remain undisturbed until it is perfectly dry and hard. After that it may be taken off, and it will be found to be as smooth as the glass itself.

The paper to be reproduced is next placed, with the side to be copied down, in a dish which contains the following transferring solution:—

Distilled water	16 ounces.
Alcohol, 90°	5 "
Acetic acid	¼ ounce.
Phosphate of soda	¼ "

Care should be taken not to get the solution on the back of the paper, which is not to be transferred, as it is then liable to print through when it is drawn through the transferring press. Should the print to be copied have been printed for some time, it is desirable to warm the solution and float the paper longer on it. The sheets should be left on the solution for at least two hours to insure perfect action. In the meantime, the plaster of Paris plate, which was completely dried before, is prepared in a dark room.

A solution of five ounces of gelatine in twelve ounces of water is prepared by letting the former soak for half an hour and then heating it to about 190°. Care must be taken to prevent the boiling of the solution. To this, six drachms of citrate of iron and ammonia and two ounces of alcohol are added and well filtered. This is when still warm. Put into a flat dish covered to a depth of about a quarter of an inch. It is well to put this dish upon a hot metal plate, as it gets hard quickly when getting cold. The plaster of Paris plate, which itself is warmed first, is dipped in the solution on the smooth side for a moment, thus letting it take up some of it, whereupon it is taken out and dried in the dark. When dry, the copy is transferred upon it in the usual way, the plaster having been placed between rubber

sheets to prevent it from breaking. Of course, also, this has to be done in the dark room, that is, at lamp or gas light. The plate is then dried once more and exposed to direct sunlight for fifteen minutes. When taken out, the places where the light has acted will be found to be quite hard, while at the other places the plaster is soft and will fall off as fine powder as deep as the solution has penetrated if brushed with a hard brush. After that the plate is ready to be stereotyped.

—*Scientific American.*

HERMAN REINBOLD.

A FEW OPTICAL POINTS IN CONNEXION WITH THE ENLARGEMENT.

THE general optical principles involved in enlarging are, for the most part, simple enough when the action of a lens in forming an inverted image of any object is once understood.

We all know that in focussing any object on the ground-glass, as we come nearer the object the image becomes larger, and we have to increase the distance between the lens and the ground-glass. This process does not of necessity stop when the image becomes of the same size as the object, except for the reason that few cameras will allow of the necessary extension. The necessary extension provided for, we may keep coming nearer to the object and racking back our ground-glass till we get any size of image that we desire. This really includes the whole of the general principles of enlarging, further complications being necessary merely to facilitate adjustments and, in certain cases, to light the negative in a special way. Of the latter a few words will be said further on.

Although the general principle is the same in enlarging as in ordinary photography, there are one or two difficulties due to the fact that the object to be enlarged from—that is the negative—is all in one plane. Most or all of them hold good for copying as well as for enlarging.

In the first place, there is no need to use a stop to gain depths of focus, as we must in most kinds of direct photographic work. It may be necessary to use a stop for the purpose of gaining marginal definition, but not for gaining depth of focus. Even for marginal definition it will, in many cases, be unnecessary. If the lens be of the rapid landscape type, if its focal length be pretty long as compared with the plate to be enlarged from, and if the subject be a portrait, it will generally be found that there is no perceptible falling off of definition, even when full aperture is used. For architectural work, where microscopic definition to the edge of the plate is generally considered essential, a small stop may be necessary. I should mention that here I am speaking of direct enlargements by daylight where no condenser is used. I shall show presently that where a condenser is employed the conditions are totally different.

Another matter in connexion with the optical side of both enlarging and copying, a matter whose enunciation is often met with considerable incredulity, is that we get in both cases precisely the same *form* of image, however wide an angle we cause the negative or picture copied to subtend. In other words, if we use a long-focus lens, so that the negative is included in a very narrow angle, or if we use a short-focus lens, so that it occupies quite a wide angle, the image that we get is precisely the same in form. Granted that the lens is rectilinear, there is not a particle of distortion in either case, not even of the form, which is more correctly termed exaggerated perspective than distortion. This being the case, it may be asked, why is a long-focus lens particularly insisted on by most writers on the subject of enlargement? To this it may be replied that there are three reasons. The first and principle is merely a case of marginal definition. It is difficult, if anything like a wide angle be included, to get even tolerable definition unless a small stop be used, and that involves greatly prolonged exposures. A second reason is that a wide angle involves unequal lighting of the image given by the lens—a rapid falling off at the edges. A third is that if a wide angle is included, the difficulty of lighting the negative—of getting an evenly diffused light behind it—is considerably increased.

On the other hand, it might be pointed out that there are some advantages not quite imaginary in the use of a wide-angle lens. The principal of these is that the falling off of light in the *negative* may be compensated for by falling off of light in the enlargement. Thus, if we have a negative showing that comparative transparentness around the edges which is due to the falling off of the light of the lens with which it was taken, we may so arrange that the enlarging lens will give a precisely similar falling off, and, of course, this, in the case of closet enlarging, means a *lightening*, not a darkening, of the edges. If, in enlarging, the negative is made to subtend the same angle that was included in photographing the object, the correction will be as nearly right as may be. This involves the use, in

enlarging, of a shorter focus lens than was used in photographing the object—unless the latter chanced to be very near the camera—because allowance must be made for increase in the lesser conjugal focus in the case of enlarging.

It is, of course, known that when artificial light is used it is practically always necessary to use a condenser in enlarging, and that, even when direct sunshine illuminates the negatives, a condenser is necessary for those kinds of enlargement which are generally known as “direct solar enlargement.” In these sensitive films of the same nature as those used for contact printing are acted upon, and, with all the light that can be got from the sun, condensed by large lenses, the exposure is long.

The condenser is generally looked upon simply as an arrangement for lighting the negative more brilliantly than it can be lighted by diffused light either from the sky or from a white sheet of any substance behind it. This way of looking at the condenser is certainly, so far as it goes, correct; but the condenser does much more than merely illuminate the back of the negative in the ordinary sense of the word.

In enlarging from a negative which is lighted by diffused light the conditions are as nearly as possible the same as when a photograph is being taken in the ordinary way. Every part of the negative is in a certain sense a source of illumination, scattering light in every direction; a certain small portion of the scattered light enters the objective. As a matter of fact, it is the white diffusing screen behind which is the source of illumination, but as this sends light *in all directions* through the negative, it may be considered as if the light radiated from points of this latter. The consequences are that the objective performs just the same functions in direct enlargement as in taking a photograph, that the same qualities are demanded, and that the same faults will show the same defects in both cases.

In working with the condenser the conditions are entirely different. The condenser, if arrangements are as they should be, throws the whole of the light which passes through the negative into the objective. Indeed, could we have a source of light an absolute point, and could we have an absolutely perfect condenser—one free, amongst other faults, from spherical and chromatic aberration—we should have no need of an objective at all. The condenser itself would form a perfect image at any desired distance from the negative. The function of the objective where a condenser is used is merely to compensate for the want of perfection in the source of light and in the condenser, for the fact that any kind of light that we can use has considerable dimensions, and that condensers are generally, from an optical point of view, very rough instruments indeed. Indeed, in some cases—for example, when certain forms of oil lamp form the source of light, and where condensers of the roughest form are used—the amount of compensation is so great that almost as much is called for on the part of the objective as in direct enlarging. When, on the other hand, we have such a source of light as the limelight, or as the electric light with a very short arc, and when the condenser is of high quality, the objective has but little to do. And now comes a curious result. All the rules, laws, &c., that we have been accustomed to with regard to relation between size of lens or diaphragm and length of exposure are upset. The light enters the objective as a cone whose apex should correspond with the optical centre of the objective. Were the source of light a point and the object perfect, the apex would be a point, and however small a stop were used the exposure required would remain the same.

As it is, the apex of the cone is always a disc of some diameter, and the introduction of a stop smaller than this will greatly increase the exposure. On the other hand, once the diameter of this disc increased, increase of the size of the stop will make no difference in the image either as regards brightness, marginal definition, or anything else; and, again, supposing the smallest of any set of lenses of the same focal length to be of diameter sufficient to admit the apex of the cone of light, all these lenses will act with equal rapidity, although used in this ordinary way one might be twenty times more rapid than another.

Another and curious result of the use of the condenser should be mentioned. It has often been observed that the qualities of negatives desirable when diffused light is used and that desirable when a condenser is employed are quite different. In the first one, the negative which serves for contact printing will serve for enlargement also. In this second case such a negative will probably give exceedingly heavy enlargements, and it is necessary, to get a luminous effect, to have a negative with clear shadows and very thin high lights. The fact has often been observed, but I am not aware that it has been explained. Let us consider this case of the condenser first. Here, as has already been said, this light which passes through the negative is sent directly into the objective. This statement, however, requires a little qualifi-

cation. It is true in the case of such light as passes through the transparent parts of the negatives; but it is not quite true, for that light which passes through the more or less opaque parts, these not being structureless, but consisting of a deposit of palpable particles, such light as is not obstructed is, to a certain extent, diffused or scattered, and consequently not the whole of it reaches the objective. Briefly put, all the light passing through a transparent part of the negative is thrown into the objective, only a portion of that passing through the denser parts is so thrown, and there is a consequent increase of contrast.

In this case of a negative lighted by diffused light the case is different. Here it is true, of course, that the denser parts of the film scatter light as before, and therefore that some rays which come from the source of light (the sheet, or white screen) to the negative, in this direction to the objective, are deflected, and never reach the latter; but on the other hand some rays coming to the negative in such a direction that they would not otherwise reach the objective are deflected into it, and the one action precisely counteracts the other.

Those who have followed the explanations just given will perceive that, when the source of light is small in rays, the amount of contrast between shadow and high light will be greater in the case of an image cut by a lens than in that which results from contact, there being in the latter case no chance for the light which passes the denser parts to scatter. This fact seems to me to introduce a possible factor of error in a remarkably ingenious method recently invented by Abney, for giving actual numerical realms to the densities of different parts of a negative—of stating, in fact, what fraction of all the light reaching a certain part of the negative was allowed to pass through it.

W. K. BURTON.

—The Photographic Times.

PROFESSOR DEWAR ON LIGHT AND ITS ACTION.

II.

PROFESSOR DEWAR gave the following figures as to the intensity of solar radiation as measured by a thermometer, and assuming a perfectly thermo-homogeneous atmosphere; the absorbing medium was a perfectly black body:—

SOLAR RADIATION.

Zenith Distance.	Thickness of Atmosphere.	Intensity of Radiation (Air Dry).
0	1000	2.403
10	1016	2.401
20	1065	2.395
30	1155	2.383
40	1305	2.364
50	1555	2.331
60	2000	2.275
70	2930	2.164
80	5700	1.868
90	35,000	0.359

He also gave the following as the most accurate measurements yet made in relation to the wave lengths and velocity of vibration of waves of light of different colours. The letters in the first column are those of the fixed lines of the spectrum:—

VISIBLE SPECTRUM.

	Wave Lengths (Centimetres).	Vibrations per second.
A	7.604×10^5	3.950×10^{14}
B	6.867	4.373
C	6.562	4.577
D ₂	5.895	5.097
D ₁	5.880	
E	5.269	5.700
h ₁	5.183	6.179
F	4.860	
G	4.307	6.973
h	4.101	7.569
H ₁	3.968	
H ₂	3.933	7.636

He stated that the first effect of the influence of light upon a chemical substance is, to produce a result which it afterwards reverse, and this is seen in the case of gum guaiacum, which turns blue when long enough subjected to the influence of light, but which by further action is bleached. Often in phosphorescent bodies the same inversion of the effect is seen. Similar effects are produced upon guaiacum by ozone; at first ozone turns the gum blue, but afterwards bleaches it, for ozone will bleach anything.

Plants will not grow in a light filtered through a solution of chlorophyll; there is also a temperature at which the chlorophyll in living plants will not function under the action of sunlight. Something apparently of the same kind may take place with inorganic substances. He took a plate covered with luminous phosphide of calcium paint, and cooled it to

eighty degrees below the zero of the Centigrade scale by means of water containing solid carbonic acid; it then ceased to shine in the dark, and could be kept from shining so long as the low temperature was maintained, but upon removing it from the bath and breathing upon it, it glowed again. He had "locked up light" in this way for three weeks. He did not know the cause of the phenomenon, so would not attempt to give any explanation.

In some additional experiments he proved that chloride of gold is sensitive to the action of light because of the starch and other organic reducing substances in the paper. He also developed with ammonia a mercurial latent image, consisting of esamel, but did not state how he prepared the paper. Perhaps with bichloride of mercury. The developed image was brown.

In the course of experiments upon the opacity of glass to radiations from luminous sources, he proved that the thinnest microscopic glass cuts off twenty-five per cent. of the radiations from a Bunsen's flame; four plates of the same glass cut off but fifty per cent., most of those rays which do not readily pass through glass being stopped in the first instance. When a cube containing boiling water was substituted for the flame, a single piece of microscopic glass cut off seventy-five per cent. of the radiations. The measurements were made by means of a thermo-pile and a galvanometer. When the radiations from the electric arc were taken, a piece of transparent glass cut off from ten to fifteen per cent. of the total emission, and deep red glass cut off but little more, proving how very transparent red is to some of the radiations from luminous sources which are not visible to the eye. Blue glass, however, cut off fifty per cent. of the total radiation. The radiation in this case, he said, is partly from a gaseous and partly from a solid source. He accordingly arranged the slit in the diaphragm of the electric lantern so that it would permit only the rays from the incandescent gas between the carbons to pass; the radiation from the gas was then proved to amount to but ten per cent. of that of the electric light as a whole. There is more heat than light in the electric arc radiation, the relative values of heat and light in which, as compared with the radiation from the sun are here given:—

	Light.	Heat.	Total Radiation.
Sun	25	75	100
Electric arc	10	90	100

If we suppose the surface of the earth in this latitude to be black, and that the sun acts vertically, then a layer of water, half an inch deep, covering the surface, would be raised in temperature one degree Centigrade after one minute's exposure. A parabolic mirror a yard in diameter, exposed perpendicularly to the sun's rays, will concentrate at its focus as much radiant energy as is evolved by an ordinary fifty-cell Grove's battery. Although glass is so opaque to certain radiations from luminous sources, plates of rock salt let them pass freely; bad absorbers are bad radiators, hence when rock salt gets very hot it takes a long time to cool.

Professor Dewar exhibited a curious way of getting a low steady light from platinum. He poured an ounce or two of strong liquid ammonia into a large globular flask, then suspended over the liquid a spiral of platinum wire which had first been made red hot. In the flask it continued to glow steadily because of the heat generated, without flame, by the slow combustion of ammoniacal gas. Would this do for a developing room lamp?

Professor Dewar then spoke of bacteria used as the basis of a photometer. He said that Engelmann uses bacteria as reagents for discovering the assimilative power of the plant cell, containing chlorophyll, for carbon, when stimulated by different rays of the solar spectrum. The method depends upon the fact that certain bacteria only exhibit movements in the presence of free oxygen. If such organisms are examined under the microscope, only those next the edge of the cover glass show any motion. They further all tend to collect where they can get free oxygen. If a cell containing chlorophyll, such as a small alga, be placed under the cover glass along with the bacteria, then they instantly collect round it, provided the illumination is sufficiently intense to cause the evolution of oxygen by the chlorophyll. When such observations are made in a pure spectrum, it is found that the bacteria collect especially at the part of the spectrum between the solar lines B and C (junction of the orange and green), and to a smaller extent in the blue just beyond the line F. These positions in the spectrum coincide with the marked absorption bands of the chlorophyll spectrum, and this coincidence would seem to indicate that those rays which correspond to maximum absorption are most efficient in the decomposition of carbonic acid, or, what is the same thing, most active in producing free oxygen from the same gas.

Engelmann has shown that some kind of colouring matter is absolutely necessary in order to bring about this light decomposition by the plant cell. It is possible by Engelmann's method to estimate quantitatively the relative activity of the different rays of the spectrum with regard to the decomposition of carbonic acid by observing the width of the slit needed in each successive region of the spectrum to stimulate the bacteria into movement in the immediate vicinity of the alga. The curve showing the relation between the wave length of light and the intensity of carbon assimilation, or production of free oxygen from carbonic acid, follows very closely the form of the curve found by Lamansky and Langley, by the agency of the thermo-pile and the bolometer for the distribution of radiant energy in the solar spectrum.

The quantitative relation which exists between the amount of absorption

and assimilation is relatively a simple fraction, and may be stated as follows:—The ratio of the amount of luminous energy which has disappeared as such, to the chemical potential energy produced, is for each wave length and all chlorophylls the same, and equal the one to the other.

PRINTING PLATES FROM PHOTOGRAPHS.

A METHOD of reproducing photographs in copperplate, lithographic, or printing presses has been realised by Captain Louis Collardon, of Cordoba, Buenos Ayres. The relief surface for the photograph is a specially-prepared surface of gypsum, which is composed of 1 to 6 per cent. chalk and 50 per cent. water to each 100 parts gypsum, the latter, together with the chalk, being finely powdered and well worked with the water to obtain a homogeneous mass, which is then pressed into plates of suitable size, having a polished surface when dry. The pigment paper is prepared as follows:—

Common black pigment paper is placed in a bath composed of 4 per cent. bichromate of potash to 100 per cent. water for from one to five minutes, as required, and then dried in a temperature of 60 degrees to 70 degrees C. The paper is then exposed to the daylight for from ten minutes to two hours, according to the strength of the light, and then placed in cold water for about an hour, and then in a bath composed of about 6 per cent. pyrogallic acid to 100 per cent. alcohol for about ten minutes, when it is placed in a frame or on a plate and dried. As soon as completely dry it is covered with powdered oxide of zinc or oxide of bismuth, which is rubbed in with the palm of the hand, thus pressing it into the deep parts, and leaving the upper parts of the lines of the figures free, the surplus powder being removed. The pigment paper thus prepared is placed in front of the camera, and a negative produced in the usual way. The negative is removed from the glass and placed between the negative of the photograph to be reproduced, and a pigment paper, which has been prepared with a strong solution of gelatine containing only a small quantity of pigment, and then copied as usual, thereby producing a positive on the pigment paper with the same irregular surface as that on the negative, which is necessary to print from. The printing block is prepared as follows:—

The gypsum plate is placed under water, and upon it the positive, also under water, then the plate with the positive is removed from the water, and the positive pressed against the plate by an indiarubber roller or squeezer to remove any air that may be between, the positive closely adhering to the plate. It is then pressed tightly in a press, and then placed in a bath composed of water and 10 per cent. sulphocyanide of ammonium, which will dissolve those parts which are not or only partially developed. When removed from this bath and washed in cold water, it is placed in a bath composed of 5 per cent. chrome alum in water for about five minutes, then removed and washed, and immersed in a bath of concentrated alcohol and dried, and then impressed into a plastic mass composed of bone dust, albumen, blood, and silicate of soda, the proportions depending on the hardness required. Any other plastic substance may be used, such as celluloid, cyanoid, &c., by means of a hydraulic press or other suitable means, steam being introduced during the operation. When cold it is removed from the press.

—Invention.

Our Editorial Table.

HINTON'S PATENT PORTABLE WASHING AND DRAINING RACKS.

We have received from Messrs. Hinton & Co., 38, Bedford-street, Strand, a specimen of these racks, the nature of which will be readily understood from the following cuts and description:—

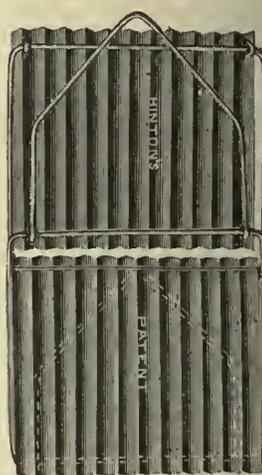
They have been specially designed for the convenience of roving photographers, both amateur and professional—especially the former—most of whom have doubtless often felt the want of such a contrivance. The one now being noticed adds very little to the weight of a travelling kit, and is quite indispensable for preventing injury to such negatives as must necessarily be developed during a tour.

With one of these little contrivances it will no longer be necessary to resort to the usual risky performances of washing negatives in a hand-basin, and drying them on the window-ledge, or similar makeshifts. It will be seen from our illustrations that the racks are capable of holding a dozen negatives, but they can be made, if required, to hold a greater number. The sides are made of the lightest zinc, bent so as to form corrugations or grooves for the negatives, and are connected together by two wire bands, hinged on them in such a way that they can be quickly folded up when required.

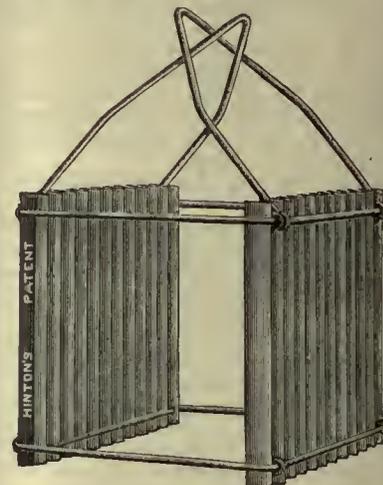
The operation of washing may be performed by placing the rack, full of negatives, in an ordinary pail, or other convenient vessel, filled with water. Wherever possible it is well to place the whole under a tap and allow the water to run slowly during the time devoted to washing.

Folding handles are provided for the purpose of suspending the

rack for drying the negatives; it can, however, be used as a standing rack, or it can be safely hung, by one handle, to a nail in the wall.



FOLDED.



OPENED.

There are no loose pieces, and no adjustment whatever of parts is required to prepare it for use; indeed, it is always ready.

From the trials we have made, they answer their intended purpose most admirably.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 12,894.—“An Improvement in an Instrument to Show the Focus of Convex and Concave Lenses.” J. ANDERTON.—Dated September 23, 1887.

No. 12,940.—“Improvements in Photographic Shutters.” F. W. BRANSON.—Dated September 24, 1887.

PATENTS COMPLETED.

A NEW OR IMPROVED INSTANTANEOUS SHUTTER FOR PHOTOGRAPHIC CAMERAS.

No. 12,755. JOHN LEISK, 169, Commercial-street, Lerwick, Sutherland.—October 6, 1886.

My invention relates to a new or improved construction and arrangement of instantaneous acting shutter to be applied to photographic cameras, and has for its object to give separate exposures to the foreground and sky in a landscape on the same negative plate, the foreground exposure being long enough to give full details of moving objects, while the sky exposure would be short enough to print clouds very distinctly or shade the sky darker towards the zenith, as in nature. All in contradistinction to giving the same exposure both for the foreground and sky with the shutters heretofore used in photographic cameras.

And the nature and novelty of my invention consist in constructing the shutter of two separate discs of wood, metal, or other material. The one, a stationary disc, is formed with an eccentric circular aperture corresponding in size with the largest working aperture of the lens used, with which it is set in a concentric line; while the other, which is a rotating disc, is formed with an eccentric segmental winged aperture or segmental circular opening with two curved open projections, one on either side, to give three different stages of exposure during an oscillation of the disc on its eccentric centre coinciding with that of the fixed disc.

Thus the upper segment of the aperture in this moving disc coincides with the upper segment of the round aperture in the stationary disc and aperture of lens. Then from the eccentric centre of the oscillating disc, which may be a radius or more vertically down from the circular aperture in the fixed disc, a circle is drawn through the centre of this aperture for the outer circumference of the winged part of the aperture on either side in the oscillating disc, and another circle is drawn from the lower diameter of the aperture for the inner circumference of these winged apertures.

A centre is taken in the circumference of the outer wings with a radius equal to the radius of the central aperture, and the ends of the segmental winged apertures are drawn, forming the said segmental winged aperture, coinciding with the circumference of the central aperture.

My improved shutter, constructed as described, can be applied either to the front or back of the lens of a photographic camera.

In applying it to the former, I secure a block or tube, with a projecting piece on its lower side, round the hood or front of the lens, to which I attach the stationary disc of the shutter with its eccentric round aperture in line with the working aperture of the lens. The oscillating disc part of the shutter is mounted on its centre in front of the stationary disc, on an arbour or spindle which passes through the latter and through the projecting block. A coiled spring is by one arrangement fitted round this spindle, preferably within the oscillating disc keyed to the spindle; the outer end of the spring being attached to the oscillating disc, and this spring is wound up by turning by hand the milled head of the spindle; and a ratchet wheel is mounted on the spindle at its inner end, controlled by a movable detent for tightening up the spring and

regulating the speed of the rotating shutter disc. A metal rim is preferably mounted round the outer surface of the stationary disc, and projects slightly beyond the edge surface of the oscillating disc to cover and prevent any light entering the lens between these discs, and this stationary disc may carry a trigger and stop for making the exposure.

When a photograph of a landscape is to be taken by the camera, the action of the instantaneous shutter is as follows:—The coiled spring is wound up on its spindle until the required tension according to the rapidity required is obtained (or if the spring be wound up it may be let down by loosening the detent). The revolving disc is then turned round by hand by means of a stud on front of it till the centre of the winged aperture corresponds with that of the lens, and is there retained by the said trigger for focussing. That accomplished, it is turned further round so as to close the lens, and is there held by the trigger. To make the exposure the trigger is withdrawn and the movable disc makes an oscillation or rotation, during which the inner open winged part of the latter coincides with and passes the lower part of the apertures of the stationary disc and of the lens, and thus a negative of the landscape is taken in which three different phases of exposure are obtained, the foreground exposure being about three times that of the sky, so that the former is fully exposed and takes in all moving objects, while the sky is not over exposed and prints clouds very distinctly, and should no clouds be visible it shades the sky darker towards the zenith as in nature. Other equivalent arrangements of springs or weights than that of the spiral spring described, might be adopted for rotating the moving winged disc at any desired speed.

The claim is:—A photographic lens shutter having an aperture of such form as to uncover the upper and lower halves of the lens aperture for different periods of time, so as to give different periods of exposure to the foreground and sky of the picture, substantially as specified.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
October 3	Notts	Institute, Shakespeare-street.
" 4	Carlisle and County	
" 4	Glossop Dale	Society's Rms., Norfolk-sq., Glossop
" 4	North London	Myddelton Hall, Upper-st., Islington
" 4	Sheffield	Masonic Hall, Surrey-street.
" 4	Sutton	Society's Rooms, IS, High-street.
" 4	Paisley	
" 4	Holmhirth	
" 4	Coventry and Midland	Coventry Dispensary.
" 4	Bolton Club	The Studio, Chancery-lane, Bolton.
" 5	Edinburgh Photo. Society	Hall, 20, George-street, Edinburgh.
" 5	North Staffordshire	Mechanics' Institute, Hanley.
" 5	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 6	Bolton Photographic Society	
" 6	Dundee and East of Scotland	Lamb's Hotel, Reform-st., Dundee.
" 6	Glasgow Photo. Association	Philosophical Soc. Rms., 207, Bath-st.
" 6	Leeds	Philosophical Hall, Leeds.
" 6	London and Provincial	Mason's Hall, Basinghall-street.
" 7	Halifax Photographic Society	M. Manley's, Barum Top.
" 7	Yorkshire College	

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.
The usual weekly meeting was held on Thursday, the 22nd instant, Mr. A. Pringle presided.

A piece of very thin transparent tissue was shown by Mr. A. L. HENDERSON, who stated that it was intended to be used in the manufacture of sensitive films, and had been patented. He had subjected it to the action of boiling water; it smelt very strongly of castor oil; he found also that it dissolved readily in alcohol and ether. Apart from photographic purposes, it had already been taken up by one or two firms for capping bottles.

A detective camera was exhibited by Mr. J. T. Collins. Its outward form was a small case carried by a strap handle; at the top a hinged lid opened to admit of the dark slide being inserted into the back of the camera enclosed; the shutter is released by a catch at the side, and an arrangement for increasing or lengthening the focus of the camera is also provided for at the side, a five-and-a-half-inch focus rectilinear lens being employed.

Mr. J. B. Wellington also exhibited a detective camera; although from a different maker, many points of comparison in the two exhibits were identical.

The CHAIRMAN asked for any of the members' experience with sulphocyanide toning. It had been stated that a strong bath destroyed the gelatine film.

This was confirmed by one or two members present.

A question being asked as to whether this bath should be kept previous to using, the CHAIRMAN said the plan he adopted was to make up a bath with the sulphocyanide and phosphate or other salts, put a few strips of the paper in it, and leave it for a day or two; the gold was then added.

Mr. W. E. DEBENHAM asked what advantage was found in the addition of phosphate of soda.

The CHAIRMAN replied that it was the outcome of experiment, and that the phosphate gave a tone more like what he aimed at.

Mr. DEBENHAM remarked that gelatino-chloride prints kept for some time and then fixed would have the appearance of being toned.

The CHAIRMAN had not found gelatino-chloride prints keep well—a red, foggy appearance set up with keeping.

At the request of several members, Mr. HENDERSON gave his formula for a toning bath that he had employed for improving some developed prints of a very disagreeable colour:—

Gold	2 grains.
Acetate	20 "
Water	10 ounces.

Neutralise with chalk and filter.

Acetic acid 2 or 3 minima.

Mr. A. L. ATKINSON drew attention to a very bad case of frilling, which he passed round. He had used methylated spirit, but with little effect.

Mr. H. Harland was elected a member of the Association.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held on Tuesday, September 20, 1887, at Myddelton Hall, Islington, N., Mr. A. Mackie, Vice-President, in the chair, a number of prints were exhibited from negatives taken by members at recent outdoor meetings or during holiday tours, and, in accordance with a promise made at the last meeting, Mr. A. Liddle had sent some specimens of "pinhole" photography, together with the apparatus used, which was of American manufacture, and sold under the name of "The Ready Fotografer."

Mr. JOHN OAKLEY asked if any of the members had any experience of Iodine as an eliminator of hypo in prints. He explained that during his holiday tour he had met a photographer who recommended its use. The method of its application was:—A small quantity of an alcoholic solution of Iodine was to be added to the washing water, the result of this was that the back of the prints turned blue; the washing was to be continued until the colour was removed, when it might be assumed the hypo was eliminated.

The CHAIRMAN said that he had never heard of Iodine being used in this connexion, but the use of iodide of starch as a test for the presence of hypo was well known.

Mr. F. W. Cox asked the best means of stripping the films from negatives on ordinary gelatine plates.

Mr. E. CLIFTON soaked his waste negatives in diluted sulphuric acid. He found in most instances the film came off entire.

A member said that it had been suggested to him that the plate should be first treated with a solution of chrome alum to harden the film, and then with a solution of fluoric acid, which would effectually effect a separation.

A question was asked whether it was possible to copy a Daguerreotype, and, if so, whether any special arrangement was required for lighting.

Mr. CLIFTON said that the only difficulty was in avoiding the reflection from objects in front of the picture appearing in the copy. The method he adopted was to illuminate the Daguerreotype by a side light only and to cover the camera with a black cloth with a hole in it for the lens. Except for the difficulty in dealing with the reflection the matter was quite an easy one, and the results were very satisfactory. The iridescent stain which appeared on some Daguerreotypes might be removed by treating with a solution of cyanide of potassium.

Mr. J. H. BIRD asked the best method of copying a paper print so as to avoid the grain showing in the copy.

Mr. CLIFTON advocated that the print to be copied be illuminated with a perfectly diffused light. He had obtained very good results by constructing a tunnel of tissue-paper at the end of which he placed the print to be copied.

The CHAIRMAN said that doctors differed as to the best method of lighting in copying paper prints. Many experienced workers advocated the use of a side light only, and that at an acute angle. In making a series of negatives for lantern transparencies from unmounted 10x8 prints he had soaked the prints in water, placed them in optical contact with glass plates, and copied them through the glass. In the transparencies from these negatives the grain of the paper of the original print could hardly be detected.

The next meeting will be held on Tuesday, October 4. Visitors are invited.

WALTHAMSTOW PHOTOGRAPHIC CLUB.

The first meeting of this Club after the summer recess was held at the Literary Institute on the 26th instant,—Mr. Gilbert Houghton in the chair.

From the large number of pictures that were handed round it was evident that this Club includes several enthusiastic and energetic members.

The Chairman had a large show of silver prints, both of landscape and figure studies, while platinotype was well represented in Mr. G. Naldrett's collection of views, taken principally in Sussex.

Mr. T. N. Waller had on view a series of bromide prints, showing a care in selection of point of view and careful manipulation of technical detail above the average.

Messrs. C. Worsfold and Betts also handed round prints.

A changing box, the invention of Mr. F. Houghton, exhibited and explained by him, calls for more than passing notice. Combining several novel features with a considerable amount of ingenuity in its construction, should render it a really useful and efficient accessory to the photographic tourist.

Discussions relative to little difficulties met with in working various processes occupied the remainder of the evening, a vote of thanks to the Chairman closing the proceedings.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of the above was held at the Technical Schools, Bridge-street, on Thursday, the 22nd instant,—Mr. J. J. Britton in the chair. Sixty-four members present.

The minutes of the last meeting were read and confirmed.

The following gentlemen were elected members of the Society:—Messrs. H. Copnall, G. Greening, H. Hollius, H. R. Leech, R. Maon, E. Shilton, G. F. Venour, and Messrs. G. C. Lloyd, H. F. Woods, and W. Walkinshaw, were nominated for election.

Exhibits of photographs were shown by Mr. Harold Baker (very fine vignetted cabinets and views); framed bromide prints, by Mr. Dennison; views of Norway, by Mr. Thomas Taylor; drying racks and phantom shutter, by Mr. W. Tylar; and a number of negatives taken on a new plate which combines the force of the old plates with the speed of the most rapid plate, by Mr. A. Pumphrey.

Question relating to the use of combined toning and fixing bath was answered by Messrs. Middleton, Pumphrey, and Tylar respectively.

Mr. MIDDLETON: Chief objection, sulphur; use a little common salt in the bath.

Mr. PUMPHREY: Not used by professionals; costs more; can take straight from printing frames and put into bath.

Mr. TYLAR: Used with success; prints toned five or six years ago still good.

Mr. E. H. JAUQUES then gave his paper on *Film Negatives* [see page 615], which was a success in every way from beginning to end, and was very highly commented upon by the members present.

Mr. PUMPHREY thought the films would be liable to take up silver whilst printing.

Mr. J. H. PICKARD said coating the indiarubber with collodion before transferring the wet negative would obviate this.

In answer to an inquiry, Mr. JAUQUES said bromide prints can be got from films very readily.

In consequence of the lateness of the hour, the discussion on the Ilford plate was postponed till October 6.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The first ordinary meeting of the present session was held on Thursday, September 15, 1887, at their Rooms, 36, George-street,—The President, Mr. Arthur Coventry, in the chair.

The minutes of the previous meeting were read and passed.

The PRESIDENT said he had the very great pleasure to introduce Mr. J. Traill Taylor, who had come from London that day to lecture to them on photographic lenses.

Mr. TAYLOR said that the subject he had selected for his discourse was *The Characteristics of Modern Photographic Lenses*. The portrait combination first claimed consideration. It was, as they all knew, a doublet, the component parts of the front lens (which is plano-convex, or nearly so) being cemented, so as to annihilate the reflections which would arise from its inner surfaces, and thus impair brilliance, while the back lens cannot thus be treated in consequence of its inner curves being of dissimilar radii. This lens possesses in a greater degree than any other the property of large angular aperture, that is, a large diameter compared with its focus, and this property it is that gives it a greater rapidity in working than others. Its covering power is limited, but it amply suffices for the purpose for which it is intended. The separation of the back components is all important, for, owing to the non-concentricity of the inner curves, an amount of negative spherical aberration is introduced sufficient to counteract the positive aberration of the front lens and also to flatten the field. When the separation between front and back lenses is great the field is flatter than when the mount is short, but this is usually secured at the expense of astigmatism, which he explained to mean the inability of the lens to transmit an oblique ray correctly. A star or circular spot will be oblong, a cross will have its vertical bar at a different focus from its horizontal limb. To test a portrait lens for astigmatism, focus a white paper cross on a black ground or *vice versa*; both limbs will be equally sharp at the centre of the ground-glass; rotate the camera so as to bring it to the side, and if astigmatism be present the phenomenon described will be apparent—one limb may be altogether invisible when the other is at its best focus. If the lens mount were shortened, or other means adopted to lessen the distance apart of front and back lenses, then would this defect be ameliorated, but the field would be rounded, no great disadvantage in a sitting figure. Many portrait lenses, especially those of foreign make, while otherwise good, do not work sharply to visual focus. While the most satisfactory way to discover this is by actual trial in a camera, opticians adopt a simpler method. Take the lens into a darkened room, and having placed a lighted candle twelve or twenty feet away, point the lens towards it telescopic fashion, and examine the image of the flame by a powerful magnifying glass. After it is focussed withdraw the lens so as to place the image out of focus, when it will be seen surrounded by green; now bring the lens nearer and place the image out of focus again, and the image will be bordered with claret. This indicates correct achromatism for photography; the visual and chemical foci will coincide. When this is not the case the lens, although perhaps giving a good image on the ground-glass, will not work to focus. The remedy for this defect is fourfold:—Having ascertained the distance between the visual and chemical foci, (a), let the lens be racked in or out to this extent; (b), let the focussing screen be set a little in or out in its frame; (c), let an exceedingly weak lens be fixed in the cap or inserted like a Waterhouse stop in the mount while focussing and be withdrawn while exposing the picture, the strength of such lens being an equivalent to the difference of the chemical and visual foci; (d), or, lastly, send the front combination to a glass grinder with instructions to regrind the contact surfaces in a tool having a longer radius of curvature; for it is usually the front lens which is the defaulter in this respect, and its fault usually lies in the direction of over correction. He had known several large and otherwise fine lenses cured of their defect by either of the expedients mentioned. When a portrait lens gives a round field it may sometimes be cured by bringing the two elements of the back combination closer together, thus increasing the negative aberration of that lens. He knew of a case in which a three-and-a-half-inch whole-plate combination that performed very badly was cured by reducing the width of the separating ring of the back lens by more than one half and bringing the front lens nearer by the extent of an inch. Photographers ought to learn how to rectify their lenses when only defective to a slight extent, for it is a well-ascertained fact that lens makers rigidly abstain from repairing or altering the productions of rival makers, named or unnamed, hence the curing of lens defects devolved in a great measure upon photographers themselves. If a portrait lens is to be employed out of doors it is well either to avoid using a diaphragm or to see that little or no sky is introduced in the picture, and that the lens is even shaded from it. This arises from the fact that portrait lenses more than others cause a circular flare spot when employed for outdoor or landscape purposes when used with a stop. The cause of a flare spot he would presently treat of, but meantime would state that if a stop must be made use of it will be judicious to place it close up to the front lens. This does not apply to studio work or copying. The front lens of a portrait combination when used alone possesses some advantages over all others for large heads. To this end the back lens is unscrewed from the mount and placed away, and the front lens inserted in its

stead, flat side towards the sitter. Pose the sitter and examine the image; note that the definition is much too soft for good effect; but insert a diaphragm about two-thirds the diameter of the lens and observe the improvement that has taken place. It has now a fine crayon-like sharpness which many will not care to go beyond, especially if the head be large. But by reducing the aperture still further, say to one-half the diameter of the lens or less, then may the greatest necessary sharpness be obtained. Many of the large direct portraits for which the Americans are justly celebrated are taken in this way. For groups on a plate three or four sizes larger than the lens in its original complete form would cover this departure is invaluable. But the stop when in its Waterhouse position is too near to the lens when thus used singly; a far flatter field is secured by inserting it at the outer end of the tube. He dwelt on this because he foresaw that the single lens was likely to be more extensively employed in studio work than it has ever yet been. But, they would say, by the adaptation he had described he merely converted the portrait lens or a portion of it into a landscape one. Quite true, and where would they find a landscape lens to surpass it? For flatness of field, equality of definition, brilliancy of image, nothing could surpass a good single achromatic, and with a given aperture it works rather quicker than a combination of lenses. The only purpose for which it is inadequate is architecture and copying, but if one was hard pressed and had no other lens at command, an architectural subject might be taken with no appreciable degree of distortion by the expedient of employing a small stop pushed close up to the lens.

(To be continued.)

Correspondence.

Correspondents should never write on both sides of the paper.

ROYAL CORNWALL POLYTECHNIC SOCIETY.

To the EDITORS.

GENTLEMEN,—Having been asked by several exhibitors at the Royal Cornwall Polytechnic Exhibition to account for certain discrepancies which appear in the Judges' reports as published in your own and in another journal, I have to explain that the official reports sent to both yours and the other paper were absolutely alike, having been written in manifold.

That which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY of September 16 is quite correct, and as issued by the Judges; the other has undoubtedly been tampered with since it left their hands.

I write this as representing the Judges, to whom several complaints have been made respecting this matter.—I am, yours, &c.,

WM. BROOKS.

To the EDITORS.

GENTLEMEN,—In reply to your correspondent, Mr. W. Crooke, I beg to state that his pictures were judged as direct pictures and not as enlargements. It was a slight error in the report.—I am, yours, &c.,

September 27, 1887.

ONE OF THE JUDGES.

THE MERCHANDISE MARKS ACT.

To the EDITORS.

GENTLEMEN,—In your answer to "Optician," *re* the Merchandise Marks Act, I agree with you that the words "warranted and sold by" would be allowed, also "made for," or simply "sold by;" but I think that the user of the words "warranted by" would render himself liable, as it is a misleading term. Even the word "warranted" is bad, as we may ask what is "warranted?" If I buy a race glass and it is "warranted," what is warranted?—that it is a race glass! In the selling of Swiss watches the sellers in many instances engrave the words "examined by" So-and-so, or "sold by" So-and-so, but some sellers leave out the words "sold by" or "examined by," and only engrave their own name, and purchasers are under the idea that they had bought one of So-and-so's own make. The Act uses the words "calculated to deceive," and upon that only I think the words "warranted" or "warranted by" would place the seller of any goods so marked in a very false position. Apologising for troubling you—

I am, yours, &c.,

J. W.

Clerkenwell, September 24, 1887.

THE AREA SYSTEM OF GEORGE SMITH.

To the EDITORS.

GENTLEMEN,—In common, doubtless, with many others who are in the habit of using many lenses for work of various kinds, I have experienced the inconvenience of carrying a battery of stops and stop cases into the field. I have, amongst others, four lenses the stops of which are interchangeable in respect to their fitting the lens tubes, these stops being at present marked with numbers on the uniform system, each set with reference to its own lens. The lenses themselves vary from 5½ to 12¼ inches focus. I must confess that after many endeavours I have failed to select or make a set of stops that I can use for all these lenses without the necessity of consulting an elaborate table, or making a long calculation, when I wished to arrive at the relative intensity of a stop when used for a lens other than that for which it was originally intended.

On reading the very interesting and impressive article in your last issue by Mr. George Smith, entitled, *A Defence of the Area System*, it became evident to me that all the usual systems of marking stops are radically wrong, and that the area system is the only one in which are combined scientific accuracy and the simplicity necessary for everyday work. Being thus converted, I fondly imagined that all my troubles with respect to stops were at an end, and that all I had to do was, by a easy calculation, to work out the area numbers of my lenses and of my stops, and all the rest "would come out of itself almost like magic." My next step was to look up and peruse Mr. Smith's previous articles on the subject, after which I was still more convinced of the simplicity of the system and its adaptability for all practical purposes.

I have, however, so far, not been so successful in applying the system as I hoped, but I have no doubt that the fault is with me and not with 'he system. In the hope that Mr. Smith, or some other kind reader, will check my calculations and point out where I am in error, I venture to trouble you with an example of my difficulties.

One of my lenses, a wide-angle doublet, has an equivalent focus of $7\frac{3}{4}$ inches, as nearly as possible. This lens I determined to mark according to the area system, and therefore, as a preliminary, I worked out its area number according to the rule given by Mr. Smith in his article in this year's ALMANAC. The rule is—To obtain the area number, multiply the focal length in inches by 4, square, and then divide by 10, thus:— $(7\frac{3}{4} \times 4)^2 = 96$. That is to say, that the area number of a lens of

$7\frac{3}{4}$ -inch focus is 96. However, to carry out the area system in its entirety, it is necessary to mark on each separate combination its own area number. I therefore ascertained that the foci of the two lenses were 10 and 30 inches respectively. In case of error, as a check, I applied Mr. Traill Taylor's rule for obtaining the focal length of a combination:—
$$\frac{10 \times 30}{10 + 30 - 1} = \frac{300}{39} = 7\frac{1}{2} \text{ inches,}$$

the separation of the lenses being one inch. This result satisfied me that any calculation based on these figures would lead to a very trifling error only, and was sufficiently nearly being exact for all practical purposes.

Again applying the rule for obtaining the area number to each separate lens, we have—

$$\frac{(10 \times 4)^2}{10} = 160 \quad \text{and} \quad \frac{(30 \times 4)^2}{10} = 1440.$$

Therefore the area numbers are 160 and 1440 respectively. These calculations are so easy that it would be almost impossible to blunder over them, but it is in the next step I get into difficulties. Mr. Smith's rule to find the area number of a combination is explicit enough, and yet my result *won't* come right. "The area number for a combination will be the two separate area numbers added together and divided by 8."

$$\frac{160 + 1440}{8} = 200$$

I have passed a sleepless night in a vain attempt to make the difference between 96 and 200 amount to only 10 per cent., the maximum error which, according to Mr. Smith, can occur. Nothing shall convince me that Mr. Smith can possibly be wrong, or that the system is not really accurate, although it appears to admit of such strange discrepancies. I shall always look upon the system as one which has particular advantages, and especially for amateurs and beginners; but as I have to earn my living by photography I shall, until I receive more light on the subject, be reluctantly compelled to plod along with that unpractical and unscientific uniform system.—I am, yours, &c., S. SIMON.

SAFETY LIMELIGHT.

To the Editors.

GENTLEMEN,—In answer to your correspondent, W. Hallett, in your number of September 23, he will find that he cannot use the blow-through jet for the Ethoxo light, as it is certain to light back and blow off the tubes. Although Broughton's ether saturator can be used safely, there is always an element of danger where there is a quantity of ether in the liquid form, and I think this style of apparatus should not be chosen by an amateur. I have used for two years the American style, "Ives's patent," made from the description given in the ALMANAC by Dr. Nicol, and found it perfectly safe in the hands of a complete ignoramus. Before using it, I tried every way to burst one, but failed in all the attempts I made. He will find that pumice tubes carefully prepared will stop back lighting, but as he purposes using gas from cylinders under high pressure, the arrangements recommended by Mr. Hardwich, viz., short tubes filled with slate-pencil dust, absolutely safe. Full particulars of size of these and method of filling will be found in the back numbers of the JOURNAL. I may tell him, however, that during last winter a single lantern was used with a simple mixed jet without safety tubes, and that during the whole time, some twenty exhibitions, nothing went wrong. Even if it had lighted back, as the saturator he was using (the one already mentioned) had so little room for gas in it the only effect would have been to blow off a tube. The operator had never used a lantern before. If you put Mr. Hallett in communication with me, I could give him all information.—I am, yours, &c., FRED. BARNER.

23, Chipping House-road, Sheffield, September 24, 1887.

PAINTERS v. PHOTOGRAPHERS.

To the Editors.

GENTLEMEN,—The recent correspondence in your columns under the heading of *Fifty Sitzings for a Portrait* has much interested me, for having had nearly twenty years' experience as a portrait painter and exhibitor, after my studentship at the Royal Academy, I am fully convinced as to the value of photography to a painter able to draw a model *without its assistance*, and think that no artist should be without this true friend, critic, and general assistant.

My excuse for encroaching upon your space is that the advice given me some years back by Sir John Millais with regard to one of the uses of photography in portrait painting may be of service to some of your readers. It was to have your first sketch in charcoal photographed to cabinet size, and reduced thus you would see at once any error in the proportion; in fact, so infallible had Sir John found this guide that he often corrected his sketch before the next sitting, and then later on the portrait would be photographed again.

Knowing the value of having one's subject picture photographed before completion, having seen many men repaint their work at the last moment before sending to exhibition in consequence of the discomfiting revelations of the camera, I took Sir John's hint (then Mr. Millais), and seeing that he generally painted with his canvas close to and parallel with his sitter, first viewing both from a distance, I had both my sitter and canvas photographed on the same plate, and found the result *very instructive*, and came to the conclusion that five minutes with the camera was worth more than all the criticism of a host of morning callers. I think it wise to first secure the basis of a good portrait, viz., likeness, and then to proceed to make Brown, Jones, and Robinson more as they should be, and not *quite* as they are, then to start with Brown, Jones, and Robinson in an artistic flight of fancy on the canvas as you imagine they ought to be, and endeavour to work in a little resemblance at the finish.

Art owes a great deal to photography; it put second-rate portrait painters on their metal, and alarmed many with its truthful drawing and modelling compared with their own mediocrity; but it has outlived most of its detractors, and of the many painters I know most of them possess a camera, make good use of it, and speak up for the "handmaid," knowing that their hand-made work has its own individual value, every inch being hall marked by their own touch. It is the second and third rate strugglers who, having called in the aid of photography, find it more than a match, and either become abject slaves or rail against it in disgust begotten of their own incapacity.

I will not presume to touch upon photography as an art, or the highest aims of portraiture—the subtle blending of the real with the ideal, but hasten back to work, to share with all true workers in the art world—be their medium photographic chemicals or turps and oil—that great incentive, the striving to attain something better than our best.—I am, yours, &c., Kensington, September 27, 1887.

LIFE STUDENT.

Exchange Column.

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

Would exchange enlarging lantern for good portable half-plate camera, lens, &c.—Address, H. HATTON, Dewsbury.

Wanted, 10x8 rapid lens by good maker in exchange for whole-plate rapid Paragon by Smit, equal to now.—Address, E. SHAW HARPER, Box 28, Southampton.

Will exchange a whole-plate camera and view lens for a complete set of lantern slides (lecture): also a Burr lens, cabinet, half-plate view lens, and sliding-body camera, for a Ross' half-plate Universal lens.—Address, HERRIOTT, Photographer, Berwick-on-Tweed.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED:—

W. H. Batten, 4, Oxford-grove, Ilfracombe.—Photograph of Miss M. Fyton and Miss B. Ash, both drowned by yacht accident at Ilfracombe, August 28.

A. Rogers, Mount Pleasant House, Bescap.—Two photographs of A. Dewhurst, Esq., alias Mad Ab.

J. McLeod, 8, Wilson-street, Newark.—Two photographs of Duke and Duchess of Newcastle, and one group of ditto.

Thomas Ball, 7, Comberton-hill, Kilderminster.—Photograph of Baxter Church, Kilderminster.

Mowl & Morrison, Hardman-street, Liverpool.—Four Photographs of Bishop of Sodor and Man.

J. C. Swales, Toll Gavel, Beverley, Yorkshire.—Four photographs of cliff climber collecting eggs of sea birds on Flambro' Cliffs. One photograph of groups of sea birds on Flambro' Cliffs, Yorkshire.

A. Knighton, 88, High-street, Ketterington.—Four photographs of the town of Kettering (bird's-eye views).

A. B. (Stowmarket).—We prefer the No. 3 cabinet,

LANTERN.—The oxyhydrogen light is best for your purpose.

GREENHORNE.—The correct exposure can only be ascertained by trial.

H. B. A.—Most, if not all, the exhibitions held are announced in our columns.

R. W.—Precipitate the silver as a chloride by adding common salt and add to the other residues.

J. C.—Negatives were broken when received, but enough remained to enable us to see the quality.

A. B.—G. F. Williams, 36, St. Martin's-lane, can supply the thin covering glasses for lantern slides.

C.—You have certainly got density enough and to spare. In such a case as this it may be well to try a bath of bichloride of mercury.

C. A. S.—Better take the lantern with you. If it is taken as one of your tools of trade or has been for some time in use no duty will be charged.

F. NIXON.—We know nothing of the firm named. We are in no way responsible for the advertisements which appear in our columns or those of the ALMANAC.

D. M. S. (Glasgow).—Obtain plain unaluminised paper and float it on a tannin solution of chloride of sodium, sensitising on a sixty or seventy-grain silver bath for one minute, over print considerably, tone in a lime bath, fix in the hyposulphite of soda in the ordinary way.

F. W. B.—1. In practice one method will be found about as good as the other. —2. If the furnace be deep enough a No. 10 or even No. 12 skittle pot may be used. Small coal would be about the worst fuel that could be used. Employ the best furnace coke.—3. Better employ the method as described in its entirety.

W. S. ANDERSON.—1. The micro apparatus is not now an article of commerce. Any optician would, of course, make it to your order, or you might obtain a second-hand one by advertising.—2. The gelatine cannot be successfully removed by dissolving it off, but it may be scraped away.—3. The slide enclosed is by the Woodburytype process.

J. COURTIER says: "Having a good supply of old silver by me in the shape of watch cases, &c., I am desirous of making some pure nitrate solution free from the blue colour; please give me the exact formula for same."—First dissolve the metal in dilute nitric acid—acid, two parts; water, one part; then place some strips of copper or zinc in the solution; this will precipitate the silver in the metallic form. The precipitate is then well washed and dissolved and afterwards crystallised.

B. C. C. inquires: "Will you please tell me the cause of halation in a negative, and means of prevention? It has occurred in one or two landscapes of mine, exposed with the sun behind the camera."—In reply: Halation is commonly caused by the light passing through the sensitive film to the back of the glass plate, from which a portion of it is reflected forward upon the film, thus blurring the image. To prevent this, paint the back of the plate with a mixture of Spanish brown (or any other convenient dark pigment), water, and enough gum arabic to impart firmness, with a few drops of glycerine to enable it to be readily removed by a wet sponge previous to development.

TOM asks: "How do some photographers manage such beautiful straight lines to their architectural subjects? I find a great difficulty. While using care, Dallmeyer's rapid, and awing back well out from the bottom, still 'I am not happy' with my results. The camera is propped up on a five-foot tripod, but to obtain the whole building you must alightily tilt, even after lifting the raising front. How do they do it? Is it by using a stand higher than mine or fire away from some elevation, as a first-floor window?"—The rule for the remedying of the evil complained of is very simple: see that the back of the camera is in an accurately vertical position before exposing. If the whole of the subject cannot be included use a lens of shorter focus. In these are comprised the whole secret of straight lines, by which we understand non-converging lines. If the lines are curved it is a certain indication that the lens distorts.

R. STEWART writes: "Could you help me to obtain a formula for printing on to wood? I have tried every way I can think of and have once been nearly successful, but I cannot find a good substance to coat my wood with first. I have tried all kinds of enamel but can get none to hold strong enough to bear being made wet. If you could help me or put me in the way of obtaining a formula I should be very grateful to you. I can get prints on with a film, but I want to get it without a film on the wood such as collodion or gelatine. I have seen woodblocks with the silver image on a white ground, which I believe is some kind of enamel. To make a photograph on to wood in that way is what I wish to obtain the formula for. I have never seen anything in the JOURNAL of the kind, so I thought perhaps there was something secret about it."—Will any one working the process practically furnish our correspondent with the desired information?

J. R. GOTZ, alluding to a notice that appeared in our number of last week, respecting a compendium of catalogues issued as a separate work, writes: "I find in it an illustration of my 'Volute' shutter described in your JOURNAL some time since, and again exhibited this year (in an improved form) at the Exhibition of the Photographic Society of Great Britain, but mentioned as the property or invention of the Stereoscopic Company, and I am surprised to find that I am entirely ignored as the inventor. I have not parted with any proprietary rights in selling some of these instruments to the Stereoscopic Company, and can therefore not understand by what means they come to claim this shutter as their own, substituting for its original name, the 'Volute' (which is actually on the block by which it is illustrated), the simulation 'Evolvute.' How far their claims to this instrument are made good by prefixing an 'E' to the original name, and using it without my knowledge or sanction, I must let your readers judge."—This is a matter which the Stereoscopic Company will doubtless be able to explain,

CORRECTION.—In the names on the key to the Convention group for "Bunn" read "Brown."

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, October 5, 1887, will be on *Developers and Developing*. Saturday outing at Broxbourne. Train from Liverpool Street, near two o'clock. During the Exhibition of the Photographic Society the members of the Photographic Club will be pleased to see any gentleman, taking an interest in photography, at their Wednesday evening meetings.

PHOTOGRAPHY IN COURT.—At the Barnet County Court the following case was heard before J. J. Cooper Wyld, Deputy Judge:—Ferrari, photographer, v. Dawson, landlord of the Hartshorns Inn, Barnet. Claim, 30s. for a coloured enlargement of a photograph and frame containing the same. Plaintiff deposed that defendant brought him a small photograph, and he agreed to make a coloured enlargement for 30s. He had done the work, but defendant refused to pay the money; he produced the picture in respect to which the claim arose. Defendant: That (pointing to the picture) is not my mother. Plaintiff, in reply to his Honour, said he had returned to the defendant the photograph which he copied, but he produced a copy of that photograph. His Honour, examining the copy and the enlargement, said he considered the portrait a good one—the likeness was undoubted. Defendant produced another photograph, saying "This is my mother; that is not." (Laughter.) His Honour, looking at the second photograph, said he could not alter his opinion. Defendant: When that thing was brought home my wife did not know it. His Honour: Is your mother living? Defendant: No. His Honour: Then you can't produce her to the court. (Laughter.) So far as I can judge the portrait is a good copy of the photograph. Defendant said he would like to call a witness, and accordingly called a lodger named Lovsey, who stated that he knew the deceased lady, and the portrait produced by the plaintiff was nothing like her. His Honour: There will be judgment for the plaintiff. How can you pay. Defendant: A shilling a month. His Honour: Nonsense. What are you? Defendant: A publican. His Honour: You must pay in fourteen days. I must say the portrait is an extremely good copy of the photograph—perhaps it is a little younger, but there is a certain amount of artistic merit about it, and at 30s. it is very cheap. Plaintiff, on leaving the witness box, handed the portrait to defendant, who refused to take it, and he then set it down in the court. Mr. Jenour (high bailiff): Don't leave it there; it will get broken. You (the plaintiff) had better keep it. Plaintiff: It is not my property. His Honour: You are entitled to keep it till you get your money safe in your pocket. Defendant: I won't have the thing. His Honour: The defendant must pay the money; he will please himself whether he takes the portrait when he pays the money.

THE LATE MR. J. G. TUNNY.—Our obituary of to-day records the death of a well-known citizen, Mr. James G. Tunny, which took place at his residence in Salisbury-place on Saturday morning after a protracted illness. Known for many years as a photographic artist, he early took a prominent position in his profession, and upwards of thirty years ago was the first to produce portraits on paper in place of the then prevalent mode of the Daguerreotype on the silvered plates. This new system he brought to great perfection in his little studio in South Clerk-street, which was then the resort of many in the highest scientific and artistic circles in the city. Mr. Tunny began life in an altogether different calling, but being gifted with tastes which led him to the study of chemistry, he carried his knowledge into practice in connexion with the art with which his name has been closely connected for so many years. In those times the leading Daguerreotypists of the city were Popowitz, Ross and Thompson, Orange and Ivan Zabot. Mr. Tunny soon forced his way to the front, and by 1851 was prosperous beyond his fondest hopes. Scarcely had Le Gray suggested the employment of collodion than Mr. Tunny, perceiving its advantages at a glance, began persistently and indefatigably to strive to overcome the many practical difficulties attending the manufacture of a stable pyroxyline and the production and maintenance of a sufficient sensitising bath. Indeed Mr. Tunny explored every new field which the rapid march of photography opened to its followers, and he communicated the results of all his efforts to the Photographic Society of Scotland, of which Sir David Brewster was the first president, and to all the photographic journals of the period. He was among the first to turn his attention to the production of burnt-in photographic enamels, and at the present time his firm is the only one in Scotland engaged in the practice of this branch. In the working of other methods, such as platinotype and collotype, Mr. Tunny was alike successful. He took great interest in the affairs of the city, and devoted a good portion of his time to what he considered the public interests. He was a Liberal of an advanced type, but for a long time past he has been laid aside from taking any part in these matters. In private life he was much esteemed by a large circle of friends for his genial and kindly disposition, and having by his own energetic exertions raised himself from an humble position in life, he was ever ready to extend a helping hand to friends who had not been so prosperous as himself in the battle of life.—*The Scottish Leader*.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE PHOTOGRAPHIC EXHIBITION.

WHEN the members of the Photographic Society of Great Britain and their friends entered the Exhibition room on the occasion of the *soirée* on Saturday evening last, they at once saw that the Exhibition this year is quite up to the mark, and that retrogression could not be thought of in connexion with it. The visitors were very numerous, and the crowding was such as to bear out the aspirations of many that the fine Gallery might have been much greater with advantage. They were received by the leading officials, including Mr. Glaisher, the President, and Mr. Cocking, the Director of the Exhibition, to the strenuous in-season and out-of-season exertions of which last-named gentleman much more is owing for the general success of the whole than an outsider can anticipate. Numerous friends of by-past times were there, and it was a great pleasure to us to resume acquaintance with them, some of them coming a considerable distance to be present on the occasion.

The Exhibition of 1887 may very well be designated one of large direct work, as the first impression we have upon entering the Gallery is the general tendency to produce large direct pictures. Now this reveals two facts, one being the advance made in the handling of gelatine dry plates consequent upon the acquired mastery over the difficulties which of necessity appertained to the introduction of an entirely new mode of producing negatives, and the other fact the advance of artistic ambition in the realisation of some preconceived idea of pose, light and shade, and general effect, which it seems to be evident is now sought to be accomplished by the production of large negatives, over which the photographer can exercise so much personal control, and which, as a consequence, reveal most undoubtedly the capacity of photography for showing individuality of treatment.

Another result which this year's Exhibition shows is the supremacy of platinotype, with its matt surface, or, properly speaking, its absence of albuminous glaze, which gives that atmospheric quality and which adds such a charm to landscapes. Of this we see numerous examples on the walls, and also that as now various tints of colour can be produced, we recognise its adaptability for giving sentiment by the sensitiveness of colour. In this connexion we may observe that the progress made in platinotype printing has singularly brought to the front one matter connected with gelatine negatives about which opinions have been numerous—we allude to the statement which has been discussed before, that distances (especially when grey tints prevailed) were not so easy to obtain with gelatine as with collodion. Probably, as far as the negative was concerned, this may partially be correct, but the printing by platinotype appears to have altered that

condition of things; the sensitiveness of platinum seems to have brought out from the gelatine negative those very delicate tints in distances which will induce photographers to devote more attention than hitherto to landscapes where these conditions form the principal attraction of the view.

In the application of photography to engraving, we are struck with the rapid progress which this branch of our art-science makes towards proficiency. We see on the walls of the Exhibition several very fine examples of, in the first place, the very good rendering of paintings by negatives, and the utilisation of these for the production of metal plates capable of being charged with printers' ink, and then giving off a print which gives so much of the individuality of the painter, without involving anything of the same kind from the manipulator, the plate being almost wholly executed by chemical means. Some of the specimens shown are most unique in their results.

We had anticipated finding many exhibits arising from the impetus given in the early part of the year to orthochromatic photography, especially in its application to natural landscape work, but, strange to say, there is not one example in the Exhibition. There are, however, on the walls several copies of paintings, but they are entirely the production of the same exhibitors who showed some examples last year, and which prove the extreme value of the process used.

There are some exceedingly interesting photographs—collotype prints—of some of the aboriginal people on the earth, which are most wonderful to contemplate, as here we have photography truthfully giving facts and suggesting ideas almost the very antipodes of advanced civilisation, and here our art-science becomes a valuable coadjutor to those studies which are outside the domain of both art and science.

The possibilities of pictorial work being done by photography are exemplified, perhaps, in a very marked way this year—although it will not follow that the attempts have in all cases been successful. At the same time, it is most gratifying to record that the desire is very evident to produce, by photographic means, either a higher phase of portrait work, or to embody the more ambitious aspirations in beauty, grace, and sentiment.

And here crops up the oft-repeated question, How much is due to the model in photographing figure subjects? Well, at once it will be conceded that the camera cannot produce beauty from ugliness, and therefore, so far, the model must be accorded some share of any success; and it also may be observed that it is a great pity, when photographs are being prepared for public exhibition, that considerably more attention is not given to the selection of better models (both for portraits and studies), where beauty of form, expression of character, and general

picturesqueness, invest their presentments with, we may say, local attractions, and then the artistic treatment should enhance and intensify those attributes by studied pose, well balanced light and shade, and carefully chosen colour of the resulting print.

As must inevitably be the case in all photographic as well as in other exhibitions, there will be seen many productions of a very mediocre character, where nothing but the simple and diagrammatic has been attempted from the art point of view, and also some very imperfect technical results from the science point of view.

We rejoice to observe that much attention seems to have been most carefully given to the framing of the exhibits, where the pictorial matter has been effectively aided by the rich *entourage* which has been adopted. Still there are many subjects which would have been doubly enhanced if darker tints had been employed, instead of light and absolutely white mounts.

We are pleased to notice that so many of our veteran photographers still keep up their annual contributions, and it is very gratifying also to observe that fresh candidates for honours are coming forward, to whom we may look for more advanced works, which assuredly will tend to their own prestige and to that of photography.

Medals have been awarded to H. P. Robinson, G. P. Cartland, W. H. Hyslop, Harry Tölley, T. A. Green, H. Collis Pettitt, John F. Roberts, W. J. Byrne & Co., F. Müller, Andrew Pringle, Bousso, Valadon, & Co., Dr. P. H. Emerson, Amman & Swan, J. B. B. Wellington, F. E. Evans, and F. M. Sutcliffe.

The first of a series of critical notices of the next exhibits, both pictures and apparatus, will appear in our next.

AFTER the Convention meeting at Glasgow some of the local members met to consider the best means of showing their appreciation of the willing labour undertaken and so well discharged by their local Secretary, Mr. J. Davie. It was then resolved to give him a testimonial in some tangible form, so that the members might convey to him that they were quite alive to the many onerous duties that had fallen to his share in the working out of the meeting to a successful issue. The call upon the local members as a body was responded to with such hearty goodwill, that the executive committee formed for the purpose met on September 23 in Cranston's Waverley Hotel, and on the occasion presented Mr. J. Davie with a purse of sovereigns.

MECHANICAL processes are, without doubt, making steady progress in England, and some excellent specimens of photographic engraving—*intaglio* plates—are shown in the Exhibition now open. But there are very few examples by the other mechanical processes. Collotype, Woodburytype, relief-block printing, photo-lithography, &c., are, we know, now being worked extensively by several firms, yet the present Exhibition is conspicuous by the absence of examples of their productions. This is somewhat a matter of surprise. Many foreign visitors to the Exhibition, we fear, will arrive at the conclusion that English photographers are still behind the age in mechanical printing processes. Perhaps, after all, many of those who do not show work of this class consider that exhibiting at a photographic exhibition would not be to their commercial advantage. However, as some of these processes become more popular amongst photographers themselves, we may hope for a large show on future occasions.

"THEY manage things better in France," says an old adage; but, if we may judge from a letter that appeared in a daily contemporary one day last week, this can scarcely be said with reference to photographing from the pier at Calais, where it appears to be more rigidly prohibited than at Dover Pier. In France, photographing or sketching in the neighbourhood of fortifications is forbidden by law; at Dover it is simply a matter of *l. s. d.* There any one who chooses to pay

the pier authorities their ten shilling impost can photograph to their hearts' content for an entire day. On Calais Pier photographing is not permitted at any price.

Now that pink-tinted albumenised paper is so very commonly employed, would it not be well to search for more permanent pigments, or dyes, than those which are so generally used? So fugitive indeed are some of them when exposed to light that even a few hours is sufficient to produce a well marked change. We recently saw some specimens which had only been two or three days in a show-case, and nearly the whole of the roseate tint had disappeared through the action of the strong light. The matter would not be of very much importance provided the colour was merely discharged and it left the paper of its pristine whiteness; but this, in all instances, does not appear to be the case. In the examples to which we refer—and we have seen many others like them—an unpleasant, faint, yellowish-brown tint remains, almost suggestive of incipient fading in the image itself. Pink-tinted papers are now being employed for collotype, particularly on the Continent, and it is to be hoped that in this case permanent pigments are used, otherwise it may tend to bring an undoubted permanent process into disrepute.

It may not be generally known to photographers that in the South Kensington establishment are some most interesting examples of very early photography, and the apparatus which was used in the early days. Amongst them are several Daguerreotypes taken by Daguerre himself. There is also a camera picture, in bitumen, by Niepce, taken sixty years ago. The early apparatus is very interesting. Many who may now be considered old at photography have heard, no doubt, of Archer's fluid lens but yet have never seen one, but they can do so in this collection, as well as the first portrait lens made by Andrew Ross, Sutton's panoramic lens, &c. A large proportion of those who have but recently entered the ranks of photography have never seen a complete set of Daguerreotype apparatus. They should pay a visit to the Museum, as they will find much that would interest them as well as afford them some instruction. They would also see examples of photography produced thirty or forty years ago, which would, no doubt, take them by surprise.

IN looking through a couple of bound volumes of the now extinct *Photographic World*, published by Bannerman & Wilson, of Philadelphia, about fifteen years ago, we could but be struck by the lamentable condition of the illustrations. With two or three exceptions the prints were all badly faded, although they were for the most part the productions of different photographers. The exceptions were two or three examples of Woodburytypes and photo-lithography. The pictures being bound up in the books have not, of course, been exposed to the influences which are usually supposed to work the destruction of silver prints, namely, moisture and noxious vapours, or the action of light. Evidently American photographs cannot be classed as being a whit more permanent than are those which are made here.

LANTERN SLIDES ON GELATINE PLATES.

III.

WE now come to the exposure and development, the latter an operation which requires care in two separate directions, namely, in producing a pleasing and suitable colour and in preserving the purity and brightness of the lights of the picture.

The colour or tone of the image will depend upon two circumstances, the developer employed and the length of exposure, the one being arranged to suit the other. With regard to the exposure itself I do not propose to say much, as nothing is likely to be so misleading as inaccurate information on this point. I have been myself so woefully disappointed in the performance of plates which, according to their makers, were warranted to produce unheard of varieties of tone with fabulously short exposures, that I shall attempt not to offend in the same way, and will merely say that the proper exposure must be learnt by practice.

One thing, however, I would point out to those who have never

previously made lantern slides with the camera, that is, that they are likely to be disappointed at first in the comparatively long exposures they are compelled to give even with rapid plates, in order to get satisfactory results as regards gradation and tone. It is easy enough to obtain fully, or even over exposed positives with very short exposures, but they will be useless for the purposes of the lantern, though probably answering well for enlarging from or for the stereoscope, as Mr. Chadwick points out. Therefore, I would warn the beginner in this class of work to fight shy of rapid exposures, but rather to commence at the other extreme, by "systematically over exposing," as somebody recently described it.

As regards the light employed, daylight, if available—that is to say, if the amateur's time permit him to work during the daytime—will perhaps prove the most generally satisfactory. Between now and the spring, it is true, the variations in value of our daylight will be many, frequent, and erratic, but on the whole, for convenience of even illumination, I do not think any form of artificial light can approach it; the only element of calculation in its employment is its strength, and as it is used direct and not reflected from terrestrial objects as in a landscape, the actinometer may be employed with perfect safety. All that is needful is to provide an arrangement by means of which the negative and copying camera may be directed at a suitable angle towards a clear sky, or, with a sheet of ground-glass interposed, towards the sun itself, when it deigns to shine. On the whole, however, I prefer diffused light.

In this connexion I may mention a "wrinkle" derived from the JOURNAL some twenty years or more ago, applied then to printing in winter. A correspondent, whose name I forget, pointed out that when snow lies on the ground, ordinary albumenised paper will frequently print quicker if the frames are inclined at an angle downwards to the snow than if turned upwards to the dull leaden winter sky. Setting altogether on one side the question of comparative rapidity, we could scarcely select a better and more even reflector for copying purposes, than a wide expanse of tolerably unsullied snow; therefore, I recommend when the opportunity occurs of a snowfall, that advantage be taken of the cheap reflector thus provided by the reversal of the ordinary direction of the camera.

In case artificial light is a necessity, now that magnesium is so cheap I think nothing else can compete with it for either economy or convenience. Economy is served by the absence of all necessity for elaborate arrangements of reflectors or condensers to distribute the light equally, and this also constitutes its convenience. Nothing more is required than to place a sheet of ground-glass in front of the negative and to burn the magnesium at a moderate distance from this diffusing screen, the distance varying in proportion to the size of the negative it is desired to evenly illuminate.

Whatever form of development may be adopted, strict care must be observed throughout, as in the preparation of the emulsion to prevent the deposition or formation in the film of insoluble lime compounds. Indeed, it is of even greater importance at this stage, for while opalescence of a plain gelatine solution or of liquid emulsion may be partially or nearly wholly removed by the addition of a minute trace of nitric acid with the only ill effect of slightly decreasing the sensitiveness, the same treatment is inapplicable to the film after development, since the strength of acid needful to dissolve the lime would also dissolve the gelatine, or cause it to frill to such an extent as to render the result useless. The means must, therefore, be preventive rather than curative.

For this purpose it is necessary to employ distilled or boiled rain water for development as well as washing, or, if these be not available, ordinary water must be freed from its lime salts as completely as possible by boiling with a small quantity of carbonate of potash or soda, and allowing it to cool and settle clear. The milkiness produced on the addition of the carbonate will show how necessary the treatment is. It is scarcely necessary to take any heed of the alkali left in the water after the lime has separated, but if the operator be ultra-sensitive on the point of accuracy he may neutralise it with hydrochloric acid before mixing his developer or soaking his plate; but I do not think he is likely to be greatly upset in his calculation if he disregard it altogether.

After development, whether pyro or iron be employed, it is desirable, but especially so in the latter case, to transfer the plate,

without previous washing, into a dish of very dilute hydrochloric acid; this will neutralise the alkalinity of the film in the one case, and protect it from the subsequent formation of insoluble lime compounds, while in the case of iron the acid prevents the formation of oxalate of lime, which is far more injurious in degree to the clearness of the film. Two or three successive washes in dilute acid—one drachm to a pint of water—may be used in this latter instance before proceeding to use plain water. The acid must be thoroughly removed before the plate is fixed, or opalescence from another cause—the deposition of sulphur—will result, and this will be impossible of removal.

It will be remarked that I recommend the use of plain dilute acid, and not acid and alum. My reason for this is that alum has an erratic tendency itself to cause opalescence, especially if the washing be carelessly performed and with ordinary water. If any signs of frilling make their appearance—a very rare occurrence nowadays—the evil should be met by the free use of common salt, or, if necessary, alcohol, rather than alum. After fixing the anti-lime precautions may be relaxed, as the danger is then past.

With regard to the formula, we have the choice between alkaline pyro, ferrous oxalate, and ferrous citro-oxalate, but I strongly prefer the first on account of the greater command of colour it gives. Ferrous oxalate may be made to give beautifully clear and colourless lights, and is *perhaps* the simplest developer to use if grey or cool black tones will satisfy, but it is extremely difficult to obtain anything like warm tones by its use. When it is used the solutions should be mixed in the proportion of five or six of potassic oxalate to one of ferrous sulphate, and used at once, and only once.

For warmer tones, though not always agreeable ones, nor under any certainty of control, the citro-ferrous oxalate developer may be used, the exposure of the plate being varied in proportion to the degree of warmth desired and the developer correspondingly restrained. The formula given in the ALMANAC (1887, page 316) answers as well as any modification I have tried.

But for range and beauty of colour we are forced to fall back upon pyro, which is capable of giving all the tones obtainable with either form of iron developer, and others which the iron entirely fails in imitating. For black or grey tones little variation need be made from the ordinary pyro and ammonia mixture—of course using sulphite—if anything the proportion of bromide may be increased with advantage to the clearness and freedom from colour of the lights. In any case, with the formulæ I gave for the emulsion in my last article, the colour will be of a warmer tint, whether grey or black, than when ferrous oxalate is employed. If decidedly brown tones be desired, they may be obtained with the bromo-iodide formula, giving a full, but not abnormally long exposure, omitting the sulphite from the developer and using the solution of full strength, and strongly restrained with bromide to keep the lights clean.

For the warm purple-black or purple-brown tones—which are so greatly admired by most competent judges—the developing solution must be considerably modified by the addition of some quasi-neutral substance, which, while taking no active part in the development proper, exercises a modifying action upon the colour of the image. A number of such substances were mentioned by Mr. William Brooks in connexion with collodion emulsion plates some years ago, and the same materials are available for gelatine with like results. The chief of these are acetate, phosphate, and tungstate of soda, which give purple-brown, purple-black, and brown tones respectively. They are used in the proportion of from five to thirty grains to each ounce of developer, being conveniently kept in solution with the pyro, thus:—

Pyrogallic acid	1 ounce.
Bisulphite of soda	2 ounces.
Acetate of soda	2 to 4 "
Water, to make	11 "

Each drachm of this solution contains as nearly as possible five grains of pyro, with a corresponding allowance of bisulphite and acetate of soda.

Browner tones are given if the sulphite of soda is omitted and the pyro kept in concentrated solution with acetic acid as the preservative, allowance being made in mixing the developer for the neutralisation of the acid and the formation of the acetate necessary to produce the

tone. Very little, if any, difference is produced whatever may be the base employed, provided the neutralisation is so performed as to leave a similar excess of alkali in each case, so that ammonia, soda, or potash may be used as preferred. I am not, however, in a position to say how long such a solution of pyro retains its original properties, having only used it when comparatively fresh.

With regard to the alkali employed, I have a strong preference for carbonate of potash as giving clearness and brightness in the film. Formerly I preferred carbonate of ammonia for the better colour it gives *easily*, but it is an uncertain and unstable salt, and not always to be trusted. The carbonates may be used without restraining bromide, and if the exposure be accurately hit for the particular solution nice warm tones are the result; but if the tone be not right, neither is the colour, so that on the whole I prefer to use the bromide and to expose a little longer than is really necessary.

Very fine tones are obtained with a formula published some time ago by Mr. Brooks in which bromide is dispensed with, and the necessary restraint applied by means of bicarbonate of potash, the loose atom of acid acting as a gentle restrainer. I have not Mr. Brooks's formula at hand, but if from ten to fifteen grains each of carbonate and bicarbonate of soda be used in each ounce of developer, the proportions will be within bounds for the results required. The bicarbonate must be increased with the exposure and warmth of tone desired. One important point in the preparation of this developer must be observed, namely, that it is imperative that the bicarbonate be dissolved in *cold* water. If hot water be used to hasten solution, a portion of the carbonic acid is given off and the acid carbonate converted to neutral carbonate.

It is impossible in these columns to fully treat the subject of variations in exposure and development and their effect in modifying the colour of the image, but I have tried to say sufficient to indicate in which direction the operator should move. I have also endeavoured to show how plates may be specially prepared from gelatine, which for lantern slides shall give results comparatively free from the usual faults of modern rapid dry plates.

W. B. BOLTON.

PHOSPHORESCENCE AND PHOTOGRAPHY.

IN the year 1874, I think it was, I engaged myself in numerous experiments in connexion with phosphorescence and photography. I had noticed that the luminous sulphides, particularly the one emitting blue or purple rays, all made impressions on wet collodion plates, which impressions easily admitted of development. The idea readily occurs to one that substances other than the sulphides, and substances which do not emit rays visible to the eye, may nevertheless radiate energy capable of effecting photographic action. The term "phosphorescence" seems scarcely applicable to radiation which is not visible. "Radescence" would seem to be a preferable term. I have found, however, when experimenting with a solar spectrum fourteen feet in length, that different eyes fix its terminations red or indigo in very different places, that what is visible to some is frequently invisible to others; and to me it appears probable that what are termed the "ultra red" and "ultra violet" rays are distinctly visible to some members of the animal "creation." The fishes which have eyes and are said to be "quite blind," and which are found in the silent waters of the great Kentucky cave, miles from the faintest light of day, very likely, in my opinion, *do* see and enjoy a possibly rapturous existence in a radescence of their surroundings—a radescence invisible to us. Cats are said to see in the dark—upon what evidence I am unaware; but as "eyes were made for seeing," I apprehend that all animals possessing them can see in their natural environment. No one doubts that bats and nocturnal birds can see, yet they are mostly abroad when it is "dark." Cockroaches and various "noxious insects" have eyes, and as they are particular not to be much about until the gloom to us is blackness, I apprehend they are surrounded by what is visibility to them. However, farewell to argument on mere terms. "Radescence," I apprehend, is right, though "phosphorescence" may not be wrong. "Radescence" then be it.

I proceeded in 1875 to make experiments, with the view of ascertaining if there were not bodies emitting radiant energy powerfully photographic in its character, but invisible to my own, and, perhaps,

to any other human eyes. I forget at this moment, and have not by me the means of reference what has been done in this way before. This, however, will not be a matter of much consequence, as my own experiments have not been based on those of others, and the results obtained are certainly of an interesting kind. "Phosphorescence," though generally regarded as an exceptional phenomenon, is, on the contrary, one of the most common, and it is usually regarded as exceptional in consequence of the circumstance that its duration (as visible to the human eye) is in most instances extremely brief (often only the fraction of a second), and that its intensity is extremely feeble. By experimenting in a proper way both these facts have long since been ascertained. Now, as the study of "phosphorescence" commenced naturally (and properly) with the substances exhibiting the phenomenon most conspicuously, my own studies on "invisible" radescence have again naturally and properly begun with those substances which exhibit this phenomenon in the most conspicuous way; that is to say, where I speak negatively of the phenomenon in connexion with a certain body, I do not mean that it does not exist or is not exhibited, but that its exhibition was not detected by the intentionally rude means employed. I have elected to use "standard photographic paper" as prepared by the formulæ of Roscoe in preference to the processes of development, that I might the more readily distinguish the *marked* cases of "invisible" radescence capable of producing photographic action. I will place on record a portion of the results which I obtained, in the order in which I find them in my note-book; and I may here give expression to my regret, firstly, that volume the second of my notes has disappeared during my journeyings abroad, and, secondly, that my work should have been interrupted, as it so often has been, in consequence not only of considerations of a merely pecuniary kind, but in consequence of the very low commercial morality of the present age, which so often—I think I may say so generally—prevents a scientific man reaping where he has sown and gathering where he has garnered. But more of this another time.

August 11, 1875, Experiment 1.—Exposed a sheet of common writing-paper (white) to sunlight for one hour. Placed on it, in a decidedly dark photographer's dark room, a piece of paper cut like a fern leaf. This piece of paper had been for four-and-twenty hours in that dark room (from which *all* light was excluded each time I left) with the object of permitting it to radiate any energy it might possess. Placed on this a piece of sensitised silver paper (Roscoe's standard), and enclosed the whole in a book. Examined under the yellow window after four-and-twenty hours. *Result:* A photograph of the cut-out leaf; not a mere trace, but a bold impression. *Inference:* That photographic action may be induced on chloride of silver paper by contact with certain substances after they have been exposed to light, although they do not then emit rays visible to the eye, and that common white writing-paper is one of these substances.

Experiment 2.—Exposed a sheet of common white writing-paper in a printing frame and under a negative of considerable density for one hour's time to bright sunshine. Removed it in dark room and placed exposed side of writing-paper in contact with standard sensitive paper, and enclosed in book. *Result:* In four-and-twenty hours a distinctly perceptible trace of the image on the negative. *Inference:* That the power of acting on the sensitised paper was caused by the action of the light on the white paper which had been in contact with it.

Experiment 3.—Soaked a piece of common writing-paper in a strong solution of uranium nitrate. Dried and exposed to daylight for some hours. Placed on a piece of standard silver paper crosswise (Fig. 1). Enclosed in book and in a few hours examined. *Result:* A decided brown on Ag paper where in contact with Ur paper, showing wire lines of the writing-paper. The silver paper where uncovered by the uranium paper remained quite white. In twenty-four hours again examined. Very singular result. The brown had vanished from the silvered side of the silvered paper and appeared on the side behind. Contact side quite white and margined by the pale blue tint produced in the first stages of photographic action, and different altogether from the deep brown upon the other side, which resembled the colour produced on photographic paper by long keeping. *Inference:* That paper soaked in a solution of nitrate of uranium is one of those other substances indicated in the inference to Experiment 1, and also that

the photographic image is capable of destruction after being produced, and of reproduction through the thickness of the paper by the con-

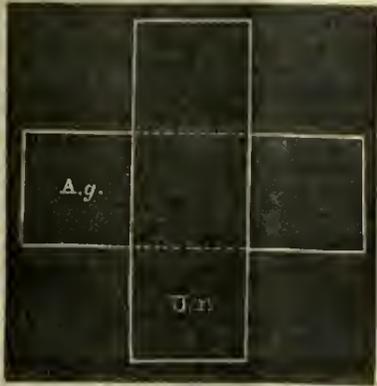


Fig. 1.

tinued action in the case of a uranium salt of the material which produced it.

Experiment 4.—Soaked paper in uranium nitrate solution as before, and exposed to sunshine for some hours. Placed a piece at the

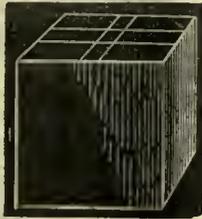


Fig. 2.

bottom of a tin box four inches deep. At the top of box placed transversely a piece of writing-paper previously long kept in the dark, and longitudinally face downwards, and above it a piece of sensitized paper (Fig. 2). Left in the dark for four-and-twenty hours. *Result*: Intense photographic action where not shielded by the writing-paper. Intensity of tint, '9 of Roscoe's unit. *Inference*: That the exposed uranium nitrate paper emitted radiant energy capable of producing photographic action on argentic chloride.

D. WINSTANLEY.

(To be continued.)

WRITING AND DRAWING ON GLASS.

III.

Black Ink.—In the previous article (see page 568) a film of sugar was recommended as the best coating to apply on glass as a means of enabling writing with pen or lead pencil to be executed thereon. We may now consider the question of the best ink to use. We have already examined common writing ink, and have found it defective in various points, and it becomes necessary to find a fluid better adapted to the special purpose we have in view. We want an ink that shall take freely to the glass, which will not blot or spread, which will produce lines of sufficient depth of colour, and which is adapted for the finest work.

In order that the ink may take or adhere to the glass, we require a fluid of the same nature as the substratum—thus on a surface soluble in turpentine we should use a substance also soluble in that fluid, as in writing with diluted Canada balsam, mixed with lampblack, upon a film of gold size. As we have selected a surface of sugar to work upon, we cannot have a better ink than one consisting of sugar dissolved in water, and, in order to render the writing visible, we must add some pigment to the syrup. Ordinary moist water colours, as used by artists, answer very well indeed; a penny cake of lampblack dissolves quickly in warm water, and if we add a little crystallised sugar we possess an ink that will answer our purpose perfectly. If the ink spreads on the glass more sugar should be added; if it does

not flow freely more water is needed; if the lines are not black enough more lampblack is required. The syrup should be thick enough to prevent the pigment settling quickly, but if the bottle containing it is shaken before use no trouble will be incurred on this account. After the writing or sketch is completed, the work may be protected from damage by a coating of plain collodion on the glass, or shellac varnish can be used without fear of disturbing the design.

Red Ink.—A good crimson ink suitable for glass writing can be made in the same way, substituting crimson lake or carmine for the lampblack. If we use the colour as we find it in the pan, it will not be perfectly transparent, and in the case of a lantern slide the lines would appear on the screen more of a black colour than red; but a simple treatment will cure this fault. We will take a pan of Winsor & Newton's moist water colour, either crimson lake or carmine, and dissolve the contents in about an ounce of hot water; when cold, ammonia is added drop by drop until the brick-red colour turns apparently to a black. This effect is caused by the pigment changing from translucency to transparency. We will now add sugar and water till a suitable consistence is arrived at, which may be ascertained by trying it as ink in a pen on a prepared glass. This crimson ink should be kept in a corked bottle, as if exposed to the atmosphere the transparency is gradually lost, owing to the escape of the ammonia. If the ink should become of its former brick-red aspect, a little ammonia dropped into the bottle and shaken up will set matters right again. Lines written with this ink will be found perfectly transparent and of a brilliant colour; the design may be protected by mastic varnish, or shellac varnish, or plain collodion. As the carmine, treated in the manner described, forms a perfect solution, it is unnecessary to shake the bottle before use.

Blue Ink.—A blue fluid, suitable for writing on glass, can be made in a similar way by using Prussian blue prepared as moist water colour. This pigment being very strong in colouring power, a small portion only of the contents of a pan will be needed, unless a large quantity of ink is wanted. The addition of sugar and water, as directed for black ink, will be all that is necessary. The fluid will then give transparent blue lines, and the writing so produced is not liable to fade. As the pigment settles in course of time, it is necessary to shake the bottle before using the ink. Varnish or plain collodion can be applied over the design as a protective film without fear of any disturbance taking place.

Yellow and Green Inks.—Various other colours can be had with the aid of different pigments. For a transparent yellow ink, we may use gamboge, Italian pink, or Indian yellow, mixed with syrup. These, however, being comparatively weak in colouring power, will not produce dark lines; if a dark yellow is wanted, a trace of lampblack may be added with advantage. By mixing the blue and yellow fluids we obtain a bright green colour; the yellow and crimson mixed yield orange or scarlet ink; the blue and crimson inks mixed together yield a violet or purple liquid. A dark blue may be had by using indigo, or by mixing Prussian blue with lampblack. In fact nearly any colour can be obtained by the various combinations; but it will be found that the black, the red, and the blue, are the best inks for use on glass.

Aniline Inks, &c.—If we make use of the dyes known as coal-tar colours, we can produce a great variety of fluids suitable for writing on glass. The mode of preparing these is not different to that adopted for the ordinary water colours, and the results are very similar in tone, brilliance, and ease of working. We can, however, produce better results with the dyes in the case of the yellow, orange, and scarlet inks, as the corresponding tints in water colours are of a gummy nature, and do not flow very well from a pen. The chief disadvantage of the dyes for our purpose is that the writings done with them do not admit of being varnished with shellac varnish or with collodion, without a spreading action taking place, through the dye being partly redissolved by the spirit. The proper varnish to employ in this case is a turpentine varnish, such as mastic, copal, or diluted Canada balsam. There are some dyes, however, which are insoluble in spirit, and if we could use for these a shellac varnish made with absolute alcohol, we might obtain good results. The ordinary varnishes contain a trace of water, which is sufficient to cause the lines to spread, unless a considerable proportion of sugar has been added to

the ink. As the dyes form perfect solutions, it is not necessary to shake up these fluids before use.

Aniline Blue dissolves easily in cold water, and if sugar is added it makes an excellent blue ink, of a more purple tone than Prussian blue.

Picric Acid, treated in the same way, yields a pale greenish yellow.

Eosine, dissolved in water, with sugar added, makes a capital scarlet ink, which can be made fairly intense by using a strong solution. Eosine is to be had in various shades and qualities—those which dissolve in cold water are the best, as the spirit-soluble dyes are less manageable. There is also a powder of a similar nature to eosine, but of a yellowish orange colour in solution; the sample in my possession dissolves easily in cold water, and makes a better yellow ink than picric acid, as it gives a more intense colour.

Aniline Black is made also of various qualities—one that dissolves in cold water is the best for our purpose; it will be found very intense, and will compare well with lampblack in this respect. It has the advantage over the latter of not requiring to be shaken up before use when prepared as ink, and if it was not so liable to spread during the varnishing it would be the best black ink we could use. The tint being generally a dark purple, it will probably be an improvement to add a little eosine or aniline orange to take off the coldness of the colour.

A small quantity of the ink may be made thus: A large tinned-iron spoon is filled with cold water, some of the powdered dye is then intimately mixed with it, and finally dissolved by holding the spoon over a gas jet, so as to boil the water. A little brown sugar is then added, and the fluid is again heated, and boiled down to a proper consistence for ink. The liquid should be tested by writing with it on prepared glass, and when a correct adjustment of the water, dye, and sugar is made, the black syrup can be poured off into a two-ounce bottle. When cold it is ready for use.

If these inks are in good condition for writing on glass, they will be scarcely suitable for paper, being too thick, and having too much colour for the latter; it will be the best plan to have special inks for each purpose. The foregoing directions for ink making are intended exclusively for glass work, and I believe, from my own experience, that they will be found quite satisfactory for the end in view.

I have not mentioned inks specially intended for the brush, simply because the conditions are the same as with the pen. If the ink and substratum are such that perfect lines can be made with the pen, it will be found that equally fine work can be done with a good brown sable; the latter has greater capabilities, but they can only be fully appreciated by those experienced in its use.

ALBERT WM. SCOTT.

SIMPLE PROCESS OF ENGRAVING GLASS AND METALS.

THERE are very many applications for an inexpensive and effectual method of etching or engraving glass in various forms, plain and plated metals, enamelled surfaces, pottery, &c. Of all existing processes for accomplishing this work, the sand blast is undoubtedly capable of the most universal application. In point of effectiveness and in general usefulness it may never be surpassed, or even equalled; yet a substitute for it, even though incapable of as extended application, will find uses in the arts, and will, doubtless, be appreciated by amateurs.

The requisites for carrying out the process in its simplest form are:—A pound of coarse emery, a pound of lead shot, a wooden box ten or twelve inches long (a cigar box will answer for the experiment), some pieces of glass or metal, and some paper patterns or stencils. The box is provided with a clip at the back and a sliding clamp at the front for holding the plate to be engraved, and it may with advantage be furnished with a clamping device of the same sort at the upper end. The lid of the box must be provided with a packing strip of thick cloth or felt to prevent the loss of emery.

The glass or metal to be engraved is cleaned thoroughly, and to secure the best effects it should be polished. A paper stencil of the desired form is fastened to the glass or metal plate by means of mucilage of good quality. The pattern should be made of thick writing paper, and care should be taken to see that every part of the paper is thoroughly attached to the plate. Any gum around the edges of the paper should be removed by means of a moist sponge. The exposed parts of the plate must be perfectly clean and free from streaks, otherwise there will be undersirable markings on the finished work.

When metal plates are to be engraved, they should be well polished before applying the stencil, to secure good contrasts. For coarse stencils and rough work, the shot should be large and the emery coarse, but for fine work moderately fine shot and finer emery are required.

After the plates to be engraved are placed in the box, the shot and the emery are poured in, the box is closed and the lid fastened, when the box is shaken violently endwise, causing the shot and emery to strike the plates at opposite ends of the box in alternation. The shot, in the operation of driving the particles of emery against the plates, become charged with particles of emery. The emery becomes so embedded in the shot as to be permanent, and a number of shot thus armed, together with loose emery, soon abrade the surface of the metal or glass wherever it is unprotected by the paper, and produce a fine matted surface, which contrasts strongly with the polished parts of the surface protected by the paper. After roughening the unprotected parts of the plate, the paper stencil is soaked off and the plate is dried, and in case it is metal it is lacquered.

Symmetrical stencils, which answer a very good purpose, may be made by cutting paper folded in various ways. Lace may be employed as a stencil, and where only slight etching or engraving is required the pattern may be produced in varnish.

To adapt this method to engraving articles having curved or irregular surfaces, the box is left open at the lower end and provided with a flexible sleeve of soft rubber. The articles to be engraved are held against the sleeve by leather straps. Designs of various kinds may in this way be permanently delineated upon the glass and metal ware, and upon small panes of glass for ornamental windows, for lamp shades, &c. Mirrors may be provided around their edges with leaves and flowers, and metal panels may be prepared for various kinds of ornamental metal work.

GEORGE M. HOPKINS.

—*Scientific American*.

NOTES ON TRIMMING PRINTS.

TRIMMING photographs is one of those little matters that do not challenge attention in anything like the same degree as other processes connected with photography. True, most people like to see a nice smooth edge to their prints, as it gives a neat and finished appearance to them. But the importance of it is perhaps greater than that generally accorded, affecting as it undoubtedly does the artistic appearance and value of the work. Artistic, by-the-by, is the only term that can be applied, as no difference is made in any other particular than appearance; but in this respect there is the power either to make or mar. In rather dark subjects especially, the slightest irregularity of the edges is at once apparent and becomes a veritable eyesore and detriment to the general effect. If a picture that ought to be rectangular is a trifle wider at one end than the other, it gives a lopsided look that is very annoying. The clean, straight edge formed by trimming may be said to be the very antithesis of the pictorial lines of the subject trimmed. Uncompromising in symmetry, it is therefore the greatest contrast of picturesque irregularity, acting as a foil to the picture, emphasising straight lines by a near means of comparison, and also increasing the picturesque effect by a severe contrast. I do not think a greater mistake can be made from an artistic point of view than the endeavour to make as *large* a photograph out of the negative as possible; "*quantitas non qualitas*" is a bad motto, and many really good pictures are damaged by this anxiety to have as much as possible (regardless of the ill effect) of the subject as can be made out of the negative. I would advise that all the worthless parts of the print, judging from an artistic point of view, should be ruthlessly trimmed off, as it is better to sacrifice part than spoil the whole.

To assist one's judgment in this respect, two cardboard masks with square openings the size of the negative will be found very useful. The print may be laid down on some flat surface and the two masks, one on the other, placed over it; by shifting them about it will be easily seen how much and what part of the margin of the print can be cut off with advantage. A pencil mark is then made and the prints trimmed to it. It will astonish many to find the amount of subject that a photograph looks better without. Foregrounds are great offenders in this respect; an unbroken patch of grass or a bare road have little beauty, photographically speaking, although we frequently see a lavish display of both in many otherwise creditable pictures. The free use of the knife on them is an unmistakable advantage.

Other shapes than those bordered by right lines will frequently add to the effectiveness of the subject. Oval, dome, and circular may often be substituted for the parallelogram; the circular is, however, scarcely so pleasing as the oval, and is only suitable for subjects

with little or no sky—those generally denominated upright pictures. Shapes of various kinds and sizes should be easily available to afford an opportunity of trying them on the prints. Preconceived ideas as to the best shapes are not always found best after trying a variety of masks. The form and amount of subject being decided upon, then comes the application of the knife or scissors. It is a very good plan when no large numbers are required, to attach a piece of hard, thick, and smooth cardboard to the face of an ordinary drawing board as a surface to cut upon. The advantages are that the knife retains its edge, the print is easily adjusted, a T square being guided by the edges of the board, and after the first incision the print becomes attached to the cardboard sufficiently firm to prevent it shifting during the remaining trimming, and this without making any objectionable burr on the edges. If a circular or oval shape has to be cut, by first securing the outer edges of the paper to the card by trimming them will, by retaining the paper in its place, facilitate cutting the oval, &c., during that operation, a point of considerable value to those unaccustomed to trim prints with other than straight edges.

A sheet of glass is perhaps as favourite a support for print trimming as any, and if the wheel cutter is used, almost necessary. The principal objection is, it so rapidly dulls the knife, and great care has to be taken to keep the prints in their proper places, on account of the smooth surface. However, the edges of the prints are cut nice and clean, which perhaps makes up for the extra trouble. In cutting, the knife well sloped should be drawn towards the operator; if held too upright there is a chance at the outset of tearing the print instead of cutting it, especially if the ruler or guide is not pressed very firmly on to the print—a point of the greatest importance during the whole of the process. If the print is at all loose between the guide and the cutting surface the cut will be irregular or notched, necessitating further trimming, possibly to the prejudice of the print if the size has been accurately marked in the first instance. Sometimes as little as the eighth of an inch taken off a picture will considerably damage the result, especially in a small print, either by destroying the balance or by removing some small object that the interest of the subject was centered in. For instance, suppose a boy flying a kite; the kite might be cut off, but many things will suggest themselves that being removed or mutilated would wholly or in part destroy the interest of the subject.

A fault we sometimes see is that prints are trimmed out of square, so that buildings have the effect of toppling over to one side or the other.

In cases where architectural objects are portrayed, the first cut should be made parallel with the upright lines of the buildings and this line used as a base for the remaining sides, then there will be no fear of getting out of square as there would be if the first side trimmed was either the sky or foreground, either of which would not supply the check the upright lines of buildings do. The foregoing remarks apply especially to landscape and architectural photography. In trimming portraits the same artistic considerations hold good; in addition, there is the effect of the proportion that it is desirable to convey. A figure is apparently increased in size if a very small space is left between the head and the top margin of the picture; the greater the space between the two the less the figure will appear, irrespective of the accessories used therewith. There should always be a somewhat larger space left in front of the figure than at the back, or the result will be a cramped effect, unpleasant and inartistic, as if the figure was passing out of the picture. In an oval or vignette head and bust, the head being uncovered, the central point of the picture between top and bottom should be generally the chin, but as a very little alteration makes a great deal of difference in effect, no absolute rule can be laid down as to the exact position of the head, this must be left to the artistic perception of the trimmer or mounter, according as the picture is to be placed in a cut-out or on a plain mount. In the latter case the trimming of the margin of the portrait will have to be *most carefully judged*, so that the right *pose* is given. A mask laid over the picture, and pencil marks made to indicate the proper direction of the marginal cuts, is almost a necessity. If the precautions in trimming prints to which I have alluded were invariably carried out we might have fewer large pictures but more artistic ones.

EDWARD DUNMORE.

ADVANCES IN PHOTO-ZINCOGRAPHY.

The Survey of India Department have published some Notes which cannot fail to interest photo-lithographers. From these we extract the following:—

In the Photographic Office, Calcutta, a new method of preparing the photo-zincographic transfer paper with arrowroot has quite lately

been introduced, which has the advantages of being very much cheaper than the method of coating with gelatine usually adopted, and of giving results quite as good, if not even better, than by the old process.

Blank post paper is coated in the usual way with two coats of the following mixture:—

Arrowroot	140 parts.
Bichromate of potash.....	70 "
Water	3500 "

After exposure to light, the prints are coated with transfer ink in the press as usual, the transfer ink used being composed of—

Hard retransfer ink (plate to stone).....	100 parts.
Lithographic chalk ink	100 "
Palm oil	7 "

After inking in, the prints are washed off with hot water—hotter than is required for gelatine transfers. The arrowroot transfer prints are found to go down well on the zinc without sticking and give clear, sharp transfers. The economy of the process may be judged from the fact that 2½ pounds of arrowroot cost only 5 annas, and coat 70 sheets of paper 34 × 26, while the same quantity of gelatine costs about R8, and only coats 40 sheets of paper.

A new varnish for negatives has also been introduced, which, likewise, is very economical and efficient. The formula was given in THE BRITISH JOURNAL OF PHOTOGRAPHY for April 22, 1887, as very suitable for gelatine dry plate negatives, but it has been found also to answer very well for collodion. It is as follows:—

Bleached lac.....	32 parts.
Borax	8 "
Carbonate of soda	2 "
Glycerine	1 to 2 "
Water	320 "

Dissolve the borax and carbonate of soda in 160 parts of hot water and throw in the lac broken into small pieces. Place the containing vessel upon a clear fire or over a gas stove, and stir till the lac is dissolved. When dissolved, allow to cool partially, and filter through filter paper, after which the glycerine is added and the bulk made up to 320 parts. After a few days a sediment separates out, and the solution should again be filtered; it will then come off quite clear and bright. Bleached lac not being obtainable, best pale shellac has been used, and it has been found that the dark colour it gives does no harm.

Collodion negatives are varnished with this varnish while still wet, after the development and intensifying are finished. Gelatine negatives may be immersed in the varnish for about a minute, or it may be flowed over them, and allowed to soak in. In either case a hard, brilliant surface results, which resists the action of water well and shows no tackiness, as the resinous varnishes sometimes do. This varnish is much cheaper than the resinous varnishes hitherto in use, the cost per litre being only 4½ annas, while benzole crystal varnish, the kind most suitable for use in the damp climate of Calcutta, costs about R3-8 per litre, and is not such a good protection.

Since the above was written it has been found that the borax varnish is scarcely strong enough for very tender collodion films that have been highly intensified with bichloride of mercury, followed by hyposulphite of soda and ammonia. The addition of more shellac will probably be an improvement.

TEN-PER-CENT. SOLUTIONS.

In the analysis of developing formulae, which will be found in another portion of this issue, the quantities of pyro, bromide, or other salts, have been given in grains and decimals of grains. This notation has been adopted with the idea of facilitating the making up of the actual developer in the case of those members who use so-called ten-per-cent. solutions. Now, although a ten-per-cent. solution seems on the face a very simple expression, it is not so easy to construct in practice, and, as a perusal of the back numbers of the photographic journals will show, is frequently very erroneously described. The difficulty of making up a ten-per-cent. solution arises from two causes—first, from the horrible muddle in which our weights and measures have got into, and, secondly, from the fact that, in dealing with a solution of a dry salt, we are speaking of two terms, solids and fluids. We wish to get a certain weight of solid by measuring out a certain quantity of fluid. A ten-per-cent. solution of a dry salt is really an impossibility. Percentages can only apply to quantities of the same term, and it is incorrect to say that a solution of ten minims of water by bulk containing one grain of pyro by weight is a ten-per-cent. solution,

any more than one could say that ten pears were ten per cent. of a basket of one hundred apples. One ounce of pyro dissolved in ten ounces of water is without doubt a ten-per-cent. solution *by weight* only; but since the whole idea and utility of making a solution is to obtain an easy method of measuring out our chemicals in a graduated glass, instead of having to go through the bother of weighing them, it is manifestly absurd to construct such a solution. Still, as long as we keep to ounces such a solution is perfectly practical, for undoubtedly one ounce of it will contain one-tenth of an ounce of pyro, and one-tenth of an ounce of the solution will contain one-hundredth of an ounce of pyro; but here the absurdity and complication of our measures come in. An ounce of water, a given bulk, weighs exactly, at a certain temperature and barometrical pressure, 437.5 grains; but, as a relic of the dark ages, we have handed down to us an ounce identical in bulk and weight, but divided into 480 parts or minims. You see the difficulty and confusion. As we said above, one-tenth of an ounce of our ten-per-cent. solution by weight contains one-one-hundredth of a grain of pyro, but one-tenth of an ounce of solution measured is forty-eight minims, and this quantity does not contain 4.8 grains pyro, as it should if it is to be a ten-per-cent. solution, but 4.375 grains, for the ounce of pyro contained 4.375 grains. We could, of course, get over the difficulty if we were to take the old apothecary's ounce of 480 grains to make up our solution; but, practically, this would give a good deal of trouble. An ounce bottle or tin of pyro contains 437.5 grains, and we should, therefore, have to open a fresh bottle and weigh out 42.5 grains to make up the difference. Fortunately, however, we can evade these difficulties. Let us see what we really mean and want when we make up a ten-per-cent. solution. We want a solution of which every minim contains one-tenth grain of pyro. This is not truly a ten-per-cent. solution, but rather a solution of one in ten, one grain of pyro in ten minims of water. And I think it would be advisable to call them by this name in preference to the misleading one of percentage. Such a solution is made up in the following way:—Take the avoirdupois ounce of pyro; take, then, the whole bottle or tin, and empty it into a graduated measure; then pour into the beaker 9 ounces and 1 drachm of water, or, if you wish to be very exact, 9 ounces and 55 minims. We have now a true one-in-ten mixture, containing 437.5 grains of pyro, dissolved in 4375 minims of water (4375 drachms=9 ounces 55 minims), and, therefore, one grain of pyro in ten minims of solution.

I have no doubt that this is what is always meant where a ten-per-cent. solution is spoken of, although, strictly speaking, it is quite incorrect to say one grain of pyro is ten per cent. of a solution of ten minims. If we had adopted the metrical system in England, the difficulty would never have happened, for in this system all the different measures are based on each other. A litre of water weighs one kilo, and one side of its cube gives a unit of long measure.

In those cases, however, where we are dealing exclusively with fluids, all the above difficulties vanish, even with our English measures. In the case of a ten-per-cent. solution of ammonia, for instance, one ounce of NH_3 and nine of H_2O make up a true and correct ten-per-cent. solution, for here we are dealing entirely with one term—namely, bulk, and one ounce of solution will contain one-tenth of an ounce, or forty-eight minims of ammonia; a drachm will contain one-tenth drachm, or six minims, of ammonia. We don't need to trouble ourselves here about grains at all. The first ounce of ammonia is measured, not weighed, and we neither know, nor want to know, how many grains it weighs.

Whilst on this subject, it may not be amiss to say a few words about dropping-bottles. This is, without doubt, the most convenient form of using the ammonia solution. There is no need to take out a stopper and flood the dark room with ammonia fumes every time you wish to add a drop or two to the developer. A turn of the stopper and the bottle is ready for use. I find the most convenient form of solution to keep ammonia in is as follows:—I fill my dropping-bottle with water, and then let it run out, drop by drop, into a graduated measure, counting the drops. I can then see what number of minims the drops of my bottle are equivalent to. Usually I find about four drops equal to six minims. I therefore make up my ammonia solution in these proportions—that is, 4 of ammonia \times 2 of water; then every drop of my bottle contains one minim of pure ammonia, and I have no calculation whatever to make; if the formula gives three minims of NH_3 , I pour out three drops from my bottle. I prefer this to keeping the ammonia in a ten-per-cent. solution, as in this case with large plates you require a considerable quantity to be measured out, and this requires two hands; whereas, with the dropping-bottle, one suffices. This is a very small matter, after all, but grains and minims are by no means large, and their use or misuse considerably affects results.

LYONEL CLARK.

—Camera Club.

SUGGESTIONS FOR COLOURED PHOTOGRAPHS.

RECENTLY there was some talk of the production of colour photographs; but, as predicted by the *Bulletin*, the pretenders proved on dissection to be no more than ordinary prints coloured from the reverse side. It is surprising that so crude a thing should hope to deceive even the most unknowing. It occurred to me, when first reading these paragraphs, that some one had put in practice a process similar to the one with which I had previously made a few encouraging experiments.

The difficulty with coloured photographs so far is that the tones and shadows of all the colours represented are formed by the browns or blacks of the print. For example, suppose in treating the picture of a lady it were required to colour the dress blue, when this was done the lighter parts would appear blue but the shadows brown-black, an effect of which nature has never been convicted. A painter would render the shadows principally by increasing the intensity of the blue. A blue print would render the dress more truthfully, but the other parts would necessarily be of the same colour. Now, if we could change the colour of the print locally, so that one part might be red, another blue, and so on, each with its proper gradations, we would have the power to produce more satisfactory pictures of coloured objects. There are several printing processes that are capable of producing pictures of any tone or colour desired, notably the "powder" and carbon processes.

I prepared sheets of paper as directed for the powder process and exposed them under a transparency. Instead of developing the faintly visible image with ivory black in the usual way, I applied dry colours (powders) carefully to different parts as seemed desirable and thus developed a coloured photograph. Being no artist, and using a poor assortment of colours not well adapted to the work, my results were encouraging though not very satisfactory in an artistic way. Still I am convinced that this process, when properly developed, in the hands of an artist would produce results superior to anything yet accomplished in colour photography. I have had no opportunity to continue my experiments in this direction. Something might be done with liquid colours on a film of bichromated gelatine exposed under a positive, which would absorb the colour in proportion as it had not been acted on by light. Again, the carbon process might be followed, the pigment being omitted and the image developed on waxed glass where it might be coloured to suit the fancy before being transferred to its final support. It might be an advantage to charge the film with tin salt or like mordant to produce insoluble precipitates of the required colours.

D. L. HUNTSMAN.

—Anthony's Bulletin.

RECOLLECTIONS OF EARLY DAYS IN PHOTOGRAPHY.

III.

THE Daguerreotype died hard, and many who had got their livelihood from it struggled on, but gradually were reduced to poverty. One morning, a clever Daguerreotype photographer, who came to purchase a few plates, complained of the falling away of customers, at the same time exclaiming that he was dying of starvation. I asked him why he did not adopt the collodion process, and he answered me that he had no means of purchasing the requisite glass slides, &c. I offered to teach him and give him credit for all that was needed. He very gratefully accepted my offer, and in a few weeks paid me. About three months afterwards he received his clients in a flaming *robe de chambre*, and treated them as recipients of his favours, the rush for portraits on collodion glass having been so great and profitable to him.

People from all conditions of life at once styled themselves "photographic artists;" poor dwarfed cobblers and tradespeople of all denominations left their pursuits to become artists in photography. They pitched their tents on houses, between chimneys even, and sometimes often above the chimneys! Others converted their parlours or little courtyards into studios, and some descended into coal-holes to manipulate there. These are things that I have seen, and during that rush if I had opened studios on every street of London and occupied myself only in riding from one to the other to supply their wants and to receive their cash, and even had the people I employed robbed me of fifty per cent., in a very short time the profits resulting would have made me a millionaire. The range of prices from quarter to half-size pictures was so great that it seemed like a fabulous mine of gold opened up to hundreds, but few laid up their profits for the future. Men who followed fairs and were adepts in cutting profiles on black paper soon became skilful in posing the sitters, and I have known some of these people to be prudent enough not to spend all they earned, but become purchasers of real estate and afterwards develop into respectable artists.

Some died leaving wealth, but very few remained at their posts in the advance of science. Mr. Grubb at that time made the finest lens for landscape photography, and thus assured the future success of the greatest discovery of the nineteenth century.

Dr. Hill Norris, of Birmingham, first introduced dry sensitised collodion glass plates, which obtained a short success. The printing on plain paper was helped on by albumenising the paper. This paper for some time was made by the French manufacturers, and owing to their abundant supply of eggs they should have been the sole manufacturers of this article, but the Germans, who were obliged to purchase their paper in France and paid an import duty, succeeded in combating the Frenchmen, and took their position in supplying the photographic dealers throughout the world on equal, or even better terms.

After Dr. Hill Norris produced sensitised collodion glass plates, Bolton, of Liverpool, succeeded in giving a better one, and others followed in the same way; but Colonel Stuart Wortley, a clever amateur photographer, produced a sensitised collodion plate that was even better. My close business transactions, as agent for the sale of sensitised collodion glass plates, allowed me to observe that whatever merit may be due to Colonel Stuart Wortley, the success of his plates was largely due to his wife, a lady descended from a noble family who was a maid of honour to the Queen.

The process for producing Talbotypes required so much neatness in manipulation, that if the suggestion made by M. Le Gray, and so ably perfected by Mr. Archer, to employ a sensitised collodion had not been made, the Talbot process would only have gone side by side with the Daguerreotype, and would have not entirely superseded it as it did.

Talbot pictures were made on a waxed sensitised paper. The first pictures of this class which were shown by Mr. Talbot were small—not larger than 4 × 6. Waxing paper was accomplished as follows:—Into a strong silver-plated tray sufficient white wax was put that, when melted, would be a deep, clear solution. The tray was placed over a small charcoal fire, and the paper laid on the wax. Great care was taken that there were no air bubbles left upon the paper, and a sheet was removed from the wax, and, while hot, held over it to allow all the surplus solution to drip off. When cool, the paper was put away to be sensitised. That being accomplished, after it had become quite dry it was placed in a dark slide, and pieces of twine were adjusted to keep the paper smooth and flat. All the operations that were accomplished after the paper was sensitised were, of course, done in a room lighted with red or yellow glass.

When the paper was exposed correctly, it was full of detail. It was developed with gallic acid and fixed with hyposulphite of soda. The pictures were usually of a reddish-brown colour, and were seldom a perfect brown or black.

The cleverest preparer of wax-sensitised paper was a man named Sanford, who was also a clever photographer, and at one time the largest producer of albumenised paper.

Among those who made immense fortunes in the great field of photography at this time were two that especially attracted attention: one, a descendant of a very humble family, died Lord Mayor of London; the other, one of a firm of glass-blowers and dealers in barometers, thermometers, and other scientific instruments. These two men's sudden rise to fortune was related to me by Mr. James Glaisher, the eminent meteorologist and since President of the London Photographic Society. During the Exhibition of 1851, Mr. Glaisher was sauntering about, looking at the scientific and other instruments in the show, when he picked up a small glass case containing specimens of blown-glass tubing for barometers, &c. He said to himself: "These were made by workmen whom I have long wished to find," and he immediately sought the address—Negretti & Zambra, Hatton Garden, London. From the interview which followed, orders were sent to them from the Greenwich Observatory, and more extensive ones from the Government. When the Great Exhibition was closed, the building was purchased by a company, which made of it the great Crystal Palace, on grounds at Sydenham, near London. The trustees gave permission to erect a studio in the building, to manipulate in the production of photographic pictures. Permission was given to the under-secretary or principal bookkeeper of the Society of Arts, and, some years after, he granted the permit to Negretti & Zambra.

Daguerreotype photography only had been carried on in the Palace up to this time, but soon after Talbot gave the right to use his patent by the public, and when Archer's collodion process was made known, the making of regular photographs in the Crystal Palace became immensely profitable to these fortunate men. They sold thousands of dozens of card stereoscopic pictures—and all were pictures of the

Palace, grounds, fountains, statuary, &c., within its circuit—at twelve shillings per dozen.

As I have said, there was another man who amassed a large fortune from the pursuit of photography. He early saw that photography would yield large profits to any one who followed it closely, and he opened half of a shop near Hanover-square with the determination to make it pay. This man's name was Nottage. He placed over the door "Stereoscopic Co.," and exposed for sale stereoscopic and other photographic pictures. His success was due largely to the aid which clever photographic artists gave him at home and abroad. Among these I may mention the names of Wilson, of Glasgow; England, of London; and Ferrier, of Paris. Nottage took a large corner house in Cheap-side, London, erected on the top floor a studio for portraiture, and employed the best manipulators in photography. When the Exhibition of 1862 was opened, Nottage was purchasing largely from Mr. England, and he suggested to that photographer to offer a large sum of money to the managers of the Exhibition for sole permission to take photographs of the buildings and on the grounds, and also to erect stalls for the sale of photographs. He obtained the permission and he shared the speculation with Nottage. From the day it was opened until the last day the sales from photographs of the Exhibition amounted each day to 800*l.*, and at one time to 1400*l.*

About the year 1865 the *carte-de-visite* was first introduced by a photographer, and these little photographs at once became popular with the public, and threatened to supersede the stereoscopic pictures in public favour. The success of the photographer in producing the *carte-de-visite* picture was not followed up by many whose situation would have enabled them to obtain custom. The stereoscopic and *carte-de-visite* was the key that opened the door of palaces of emperors and princes to the plebeians, for these pictures gave correct likenesses of the inhabitants of their magnificent residences. The *carte-de-visite* picture was a very great saving of money to royalty, and they were distributed more freely. Autographs generally accompanied the *carte-de-visite*, and sometimes it was sent as a present with a diamond ring or gold pencil-case instead of a coloured miniature on the lid of a gold snuff-box surrounded with diamonds and other precious gems, as had formerly been the custom.

The enlargement of pictures from small negatives was no longer a secret in the hands of a few. I did my utmost to help photographers with a machine to easily accomplish the production of enlarged pictures. About the year 1865, the discovery was made that magnesium was not so rare as was hitherto supposed. It had formerly only been seen in the cabinets of scientific collectors of rare metals, &c., but now magnesium was sold by a firm in Manchester in the form of very small wires about seventy to eighty yards to an ounce, and this wire, when set fire, burned with a splendid white flame which was suitable for making photographs. I purchased with much difficulty one-quarter of an ounce for twenty-one shillings. I was much excited over this discovery, and thought from the light so nearly resembling sunlight that it would greatly benefit the photographers of London, where so many dark days prevailed in the winter, and thought it would also help photographers to work at night. I thought it might also be used for the magic lantern, but the manufacturer of the metal could not produce it free from alloy with other matter. I had this light adapted to the machine for enlarging small pictures, which it did in many instances, before rock oil was better understood. For some years I made the sale of magnesium the speciality of the house with which I was connected, and I have no doubt I was the best customer of the manufacturer of that metal. I may mention that one customer of mine, a Mr. Parker, an antiquarian and the celebrated author of the *Remains in Rome*, from his friendship with the Cardinal Antonelli obtained permission for a photographer whom he kept to photograph the interiors of the catacombs in Rome, and with the aid of magnesium some excellent pictures were made.

At a meeting of the London Photographic Society, soon before the retirement of Baron Pollock, the honoured and revered judge who was President of the Society, there were shown to the members some large pictures on paper which were unlike anything that had hitherto been seen. They consisted of landscapes, and were prints that had been discovered in the studio of Watt, the great engineer and partner of the manufacturer Bolton, of Birmingham. It was said that the studio had been closed for many years after the death of Watt, and had only just been opened by a descendant who found with these prints a camera obscura. The President and others thought that these prints were produced by photographic means, but the colour was a deep brown, one that could not have been acquired by age. They were not lithographs, and it could not be decided upon by the learned members just what they were. If the descendants of Watt have in their possession anything found in the old studio, the present advanced knowledge of chemistry and other scientific studies might enable us to solve this apparent mystery.

J. SOLOMON.

OPINION OF THE LONDON DAILY PRESS ON THE
PHOTOGRAPHIC EXHIBITION.

[*The Times.*]

PHOTOGRAPHY is nearing its jubilee. Like telegraphy, its origin and growth have been almost contemporaneous with Her Majesty's reign, for if any year could be assigned for its invention it would certainly be the year 1839, in which Daguerre and Fox Talbot published their respective discoveries.

No discreditable result of forty-eight years' work is to be seen in the Exhibition of the Photographic Society, which opens this morning at the rooms of the Royal Society of Painters in Water Colours in Pall Mall. The number of pictures shown is a little smaller than last year; but this is itself a distinct advantage, whether it be due to greater strictness on the part of the Hanging Committee, or to the competition of the numerous similar exhibitions which have been held this year in different parts of the country. Certainly in no other respect is there any falling off. In the quality of the work exhibited the present collection need not fear comparison with any of its predecessors. It is true that it contains no striking triumph of the interesting art of photography, nor has it any special examples which can be pointed out as marking progress made during this particular year, but it certainly illustrates, as completely as could be desired, the present condition of the art, and shows the point which the most skilful photographers have now reached. One specially attractive feature of last year's Exhibition is again noticeable. Three or four years ago the most usual objection urged against any collection of photographs was its monotonous appearance. Photographic printing had but a limited range in colour. Only purplish blacks and various tones of brown were available. Even when prints produced by the "carbon" process were shown they were generally of the same tints, and it was understood that the public taste had been so educated to the "photographic" colours that no other hues were permissible in a photograph.

This notion is now quite obsolete. A glance round the walls of the Gallery shows as wide a range of colour as need be wished for monochrome pictures. Probably the old process of printing on albumenised paper rendered sensitive by a salt of silver is still used by a majority of the exhibitors; it is only by a small majority, and its most important rival, the platinotype process, runs it very hard. As regards the best pictures, judged by the awards of the medals, the two processes are precisely on a level, for platinum and silver each carry off six medals. Considering that the adoption of the newer method involves the abandonment of one long tested and thoroughly familiar to all photographers, this fact shows pretty plainly that the cleverest photographers find platinum a better medium than silver. The use of the latest of printing processes, that in which silver is still employed, while the albumen is replaced by gelatine, seems to be for the most part confined to enlargements. Many admirable examples of these are exhibited, the limit of size being reached by two enormous figures, each some eight feet high, which suggest future applications of photography to the art of bill posting. It is, however, but fair to add that the results obtained by direct printing on the gelatino-bromide paper are so like platinotype that it is often difficult, sometimes impossible, even for an expert to distinguish between them, and the catalogue does not always give the process.

The Judges have up to the present awarded seventeen medals, and the awards for apparatus, &c., have yet to be announced. Of these, three have gone to landscape, two to portraiture, four have been given for figure and other studies, one for pictures of yachts, two for photo-micrographs, two for photogravure, two for photographs of theatrical performances, and one for photographic lantern slides.

The landscapes generally are certainly not above the average; perhaps they are even a little below it. Mr. Tolley's view of a bit of cliff and shore, with its single solitary figure, is perhaps the best, but Messrs. Pettitt's and Green's views of the Lake District are both very good. The atmospheric effect in two of the latter gentleman's views is very finely rendered. There are other landscapes nearly as good as the medalled pictures, but certainly none better.

Without much question the finest portrait in the Exhibition is the head of Mr. Perigal shown by Mr. Mendelssohn, who, as one of the Judges, could not receive a medal. Mr. Byrne's prize medal portrait, a life-size head, is fine, but two other portraits in the same frame certainly make the spectator doubtful of the advantage of taking these big heads life-size. The other medal for a portrait goes to Mr. Müller for a pleasing half-length figure of a lady.

The series of studies for which a medal has been given to Mr. Sutcliffe includes some of the best work in the Gallery. They are small landscapes with figures; in two of them singularly beautiful cloud effects are given. Mr. Robinson is well known as one of the most skilful of those photographers who devote themselves to the composition of pictures by photography, either by introducing specially dressed models into a suitable scene, and thus arranging a picture which is photographed as a whole, or by taking separate negatives which in the process of printing are skilfully combined into a single picture. His picture this year of a couple of country girls following a path over a moor, with sheep grazing in the background, is very pleasing at first sight, but a closer inspection raises questions of perspective and lighting in different parts of the picture which detract from its artistic value. Mr. Emerson's *Poacher*, a

study of a single figure, shows a certain artistic sentiment, but is not very attractive. Mr. Wellington's frame of various small pictures has been fortunate in catching the eye of the Judges among so many others of a similar character and excellence.

The medal awarded to Mr. Hyslop for his yachts is thoroughly well bestowed. So much excellence has been attained in this line of work that it is difficult to see where there would be room for improvement, but Mr. Hyslop has succeeded in giving an appearance of life and motion to his yachts that has perhaps never previously been shown. This is due to the fact that the vessels are taken broadside on, when they are passing before the camera with the greatest apparent motion. As a rule, objects in rapid motion are taken when crossing the line of sight at a slight angle, and their motion in the field of view is consequently less. Mr. Hyslop's yachts were, it is understood, taken from a steamer running alongside them, and consequently the difference of motion between the camera itself and the object photographed was probably not very great. The same exhibitor shows some views of the yacht "Thistle," which are not quite so good, but are interesting just now.

Mr. Roberts's theatrical scenes, taken by gaslight, receive a medal on account of the technical difficulties attending such work, and a similar reason must be assumed to justify the medal for Mr. Cartland's picture of the performing elephants at Olympia.

Among the pictures which have not been noticed by the Judges are some which might well have deserved such a distinction. The most interesting series of photographs in the Exhibition is the collection of views in New Guinea by Mr. Lindt. These must be the first of the sort that have reached this country, and they afford an excellent example of one of the most important applications of photography, the production of trustworthy evidence of exploration in unknown lands. For these reasons a medal might well have been bestowed upon them. Mr. Gale (who takes the medal for lantern slides) has some exquisite little figure studies. Mr. Donkin shows some more of his well-known Alpine views (as he is one of the Judges they are out of competition), and Captain Abney supplements these with some fine Swiss pictures from points below the snow line.

Mr. Cobb, whose instantaneous views of London streets are in all the shop windows, has a rival in Mr. England, who exhibits a delightful series of tiny pictures taken from a tricycle with a small camera.

Mr. Wyles and Mr. Mallin show pictures of flying gulls, remarkable as illustrations of the powers of modern dry plates. Messrs. Benque & Co. show some admirable portraits printed in platinotype, while remarkable photographs of lightning have been contributed by E. S. Sheppard and J. Guardia. These, like all previous photographs of the same sort, show nothing of the conventional zigzag flash, but give either wavy lines like those produced by the spark between the terminals of a powerful electrical machine, or a series of such lines branching out from the principal lines. Also worth notice are the pictures sent by Seymour Conway, R. G. Wilkinson, L. Sawyer, W. Wainwright, Messrs. West (yachts), G. Davison, T. Hall (some fine heads of dogs, but a little too much "retouched"), the School of Military Engineering, and G. Renwick.

Messrs. Bousso, Valadon, & Co. (the successors to Messrs. Goupi) show some singularly fine examples of photogravure, the largest of which takes a medal, though in point of technical excellence it will by many be thought to be surpassed by a frame of smaller reproductions exhibited by the same firm. Messrs. Annan & Swan also show some good photogravures, for one of which a medal is awarded. These examples show the progress which has been made in the art of reproducing pictures in the form of engravings by mechanical processes. It is true that the plates are very far from being produced without handwork—how much is hand and how much photography cannot be said—but it is quite certain that the process leaves much less to the hand now than it did a few years back, while giving results that are better than of old. The work has been greatly assisted by use of so-called orthochromatic plates—plates, that is, which render colours in a scale of light and shade more natural to us, more consonant with what the eye sees, than the scale on which they are reproduced on the photographic plate. The best results which had up to that time been produced were shown in last year's Exhibition. Similar examples are now exhibited, but nothing very much better. The application of the same process to landscape photography, from which much was hoped, does not appear to have produced results of any great importance.

Only two series of photo-micrographs are shown, by A. Pringle and F. E. Evans. Both of these take a medal, though there seems little in the pictures of the latter gentleman beyond the usual average of such productions. Mr. Pringle's photographs of microscopic organisms belong to a much more difficult class of work.

In addition to the pictures on the walls, the Exhibition includes a collection of photographic apparatus, and this to many photographers is the most interesting part of it. One striking point about this collection is the wonderful complexity of the mechanism which the modern inventor thinks needful, or at all events desirable, for the not very elaborate process of taking a photograph. It would be interesting to know, if it were possible to ascertain, how many of these elaborate devices have been used in the production of the pictures by which they are surrounded. Cameras with every conceivable adjustment, shutters said to be capable to making exposures of any duration from some infinitesimal fraction of

a second upwards, stands which collapse into a few inches and extend to many feet—examples of these and more than these are shown till one admires at once the ingenuity of the maker and the skill required by the user. Among the cameras, the most novel—if it be now novel—is the “detective,” a camera made to look like anything but a camera, with which the unsuspected photographer may pursue his way, undisturbed by the interested street-boy or the suspicious policeman. Several types of these are shown, many of considerable ingenuity and excellent workmanship. They may be considered to culminate in the waistcoat or bosom camera, which instrument is to be concealed within the folds of the wearer's waistcoat or shirt front, the minute lens projecting through a spare buttonhole. Some small but excellent photographs are shown which were said to have been taken in this remarkable little apparatus.

Among the more important of recent photographic instruments is the device by which a series of pictures can be taken on a long roll of sensitive paper, the successively exposed pieces being afterwards cut off and developed in the ordinary manner. The roller slide in its completed form is now just two years old. Several improvements in it are shown by different makers. The Eastman Company show also a good series of “film” negatives taken in one of these slides. To produce these, the thin gelatine film, which is mounted on paper originally, and is in that state exposed and developed, is eventually stripped from the supporting paper, and, after being backed up by a transparent gelatine skin to strengthen it, is used for printing. These films are coming largely into use for outdoor work, but for portraits in the studio, where the weight of the apparatus is not a primary consideration, they are not likely to be used.

[The Standard.]

The Annual Exhibition of the Photographic Society, which has just been opened, enables us to appreciate, at a glance, the vast progress which has been made in an art still in little more than its youth. The visitor who wanders through the rooms in Pall Mall, hung with specimens of every artistic, scientific, or commercial application of sun-picturing, and strewn with apparatus of the most ingenious description, has some difficulty in realising that he is witnessing the triumphs of an invention which began within the memory of men now only middle-aged, and attained nothing like its present perfection until times so recent that we can all recall them. Photography, using the word in its most comprehensive sense, is, indeed, within a couple of years of its Jubilee. Only lately France was celebrating the glories of Daguerre, and erecting a statue to him in his native place. But had Daguerre lived he would to-day have been no more than a century old, and he was so well advanced in life before he hit upon his great discovery that fifty years have not yet elapsed since he and Isidore Niepce parted with their great secret for the very slender pensions paid, in order that their country might present the world with a discovery which, next to printing, has of all the graphic arts influenced it most. Daguerre's ghostly shadows were, however, if wonderful in their way, somewhat expensive, and by no means the most artistic triumphs of the sun. Daguerre died in 1851. But years before, modest and little known, our countryman, Fox Talbot, was hard at work on an experiment which has had more to do with the popularisation of photography than all the improvements in it which have been effected within the last thirty years. Long before he heard of Daguerre's triumph, he had been endeavouring to fix that fleeting image of the camera which had so often eluded the grasp of eager experimenters. But his medium was paper instead of glass. That he succeeded we know. His method may have been cumbersome and costly, and the French, in their excusable jealousy, have declared that it was impracticable. Yet, though inventions out of number have revolutionised Talbot's process, he, and he alone, hit upon the plan which is now so familiar to us. Five years, indeed, before Daguerre's method was a *secret de Polichinelle*, this unobtrusive man had solved for himself the problem of fixing the photographic image on paper. But there was yet another unknown discoverer who anticipated them all. While half the Academy of Sciences were struggling with the difficulty, a poorly-clad, half-famished-looking lad left a plate at the shop of Chevalier, the optician, on the Quai de l'Horloge, which proved that he had succeeded where all others had failed. He promised to return next day and show how the victory had been obtained. But from that hour to this he was never seen. Probably he fell sick, and was buried in a pauper's grave, and the world will never now know the name of the first Professor of Photography, or the details of its earliest romance.

In the Exhibition in Pall Mall there are no signs of crudeness to our eyes. Yet crude, no doubt, and ludicrously imperfect, will to-day's performances seem to the photographers of a decade hence. But we, who lack the power of prying into futurity, may well regard these proofs of the industry and ingenuity of the last thirty or forty years with a pride unchastened by the dread of its being premature. Not only are the pictures fairly deserving of the misused title of “artistic,” but even the mechanical processes by which they have been produced show an advance on what we used to witness, demonstrating the technical skill which is at the service of the art. The old process of printing on albumenised paper, rendered sensitive by a salt of silver, still holds its

own as one of the neatest of methods whereby negatives can be multiplied into positives. But the platinotype runs it closely, and now the direct printing on gelatino-bromide paper is likely to become a rival to the best of the old plans. When the local photographer first made his appearance, his ambition was to imitate the painter's conventionalities. His sitters were lay figures—stiff as tobaccoists' signs. They sat or stood by a marble pillar, with a window curtain in the rear, and had either their forefingers in a “property” volume, or, after the ancient fashion of the painted portrait, pointed menacingly to a pile of correspondence on the table. Nothing like this appears in Pall Mall. Even the “photographic face”—the wooden smirk or the frozen glare—seems to be a thing of the past; instantaneous plates rendering a sitting no longer the torture it used to be in a day of three-minute exposures. There are portraits of people as natural as in life, and *tableaux vivants* which form pictures in the strictest meaning of the term. The landscapes are in many instances even better than the figure groups, for the difficulty of getting the lights and shadows has often been admirably overcome. As for the works of utility, the views of remarkable buildings, and of other objects, the chief merit of which is absolute accuracy, photography has long ousted the pencil from the place which it once enjoyed as the only means of reproducing them on paper. This triumph is in no small respect due to amateurs. They, having more license than the professional photographer, and being less in dread of the pecuniary risks run by the innovator, have in a remarkable degree contributed to the advancement of the art. Some of the best work in this year's Exhibition is theirs. Dry plates are so easily carried that photography forms the favourite amusement of hundreds of tourists and residents in the country; with a result which might well abate some of that kindly contempt which the professional photographer, like the professional painter, is in the habit of extending to the “amateur.”

There are, of course, limits which photography will never pass. A photograph is at best only a transcript of Nature in her passing moods. It is not, and can never be, even in the shape of a “composite” photograph, anything corresponding to what the painter endeavours to transfer to his canvas. But allowing for these deductions, it is scarcely possible to exaggerate the uses of the sun as a limner. A traveller is no longer compelled, like Bruce, to laboriously acquire an art for which he has possibly little aptitude, in order to return with a portfolio of drawings from the region which he visits. He carries a camera, and in fewer minutes than his predecessors took days secures views which put to silence the sceptic, and make his readers almost as wise as himself. In a few years the old painted travel-pictures will have disappeared from the books, though they die hard. Mr. Cope Whitehouse, in the current number of a geographical magazine, has illustrated the persistence of erroneous views by a curious study of Fingal's Cave as it appears in the works of the most distinguished geographers and geologists. Nine out of every ten engravings of it are traditional and erroneous, dating as they do before the days of Talbot; while the illustrations in Livingstone's early volumes of travels bear the distinct impress of being for the most part the results of a London draughtsman's imagination. But science no longer depends for the figures of minute objects on the engraver. Micro-photography has displaced him. The ethnographer has now an ample series of photographs on which to work. By aid of Mr. Dalton's superimposed pictures he can even obtain an average racial or family type. The geologist has found that, as the camera has no theory to support, its sections and its contours are more trustworthy than those which unconsciously take a bias from the prepossessions of the artist. Even the zoologist and botanist find photography servicable. There are glacier views such as the finest of Agassiz's plates cannot equal, and so large that there can be little question that photography before long will be pressed into the service of the bill-poster. In fact, we all now run hourly danger of being photographed in spite of ourselves. There are “detective cameras,” which render it possible for your *vis-à-vis* at a dinner-party to secure your likeness by means of a tiny instrument, furnished with a lens which looks like a shirt-stud. And there are others which enable the polite gentleman who lifts his hat to a lady to walk away with her portrait at the same moment. The criminal who dreads having his “picter took” in prison, and does his best by contorting his features to render it unrecognisable, can be photographed in the street and in the dock without his being aware of the fact. At one time the knavish contractor in Peru or China could draw on the London office for work which had never been performed. But now with his accounts he is expected to send a photograph of the condition of his bridge or his dock, so that the Directors may know that they are not paying for what has still to be done. The scholar copies a rare manuscript or engraving by photography, and reproduces it by one of the many photo-engraving processes with a speed and a cheapness utterly unattainable a few years ago. The day will doubtless come when the oft-announced discovery of photography in colours will actually be made. Then the art lover may for a few pounds own half the masterpieces of the Pitti Palace, reproduced with an accuracy which no copyist can approach, and with a celerity which can only be attained by an art which pictures a flash of lightning, a spray of foam from the crest of a wave, a horse in full gallop, or a railway train rushing along at such speed that it is impossible to recognise the faces of passengers at the open windows.

METROPOLITAN INDUSTRIES.

THE ATELIERS OF MESSRS. ENGLAND BROTHERS.

No name is better known in London circles in connexion with photography than that of Mr. William England, who has practised in succession every branch and process of photography from the Daguerreotype onwards, and has done so with a high degree of success, both technically and financially. It is claimed for Mr. England that he was the first who made views of America, especially of the Niagara portion of it, by photography, from which the inference may be deduced that he has been in harness for a long period.

A few days ago we paid a visit to this veteran photographer at his residence, St. James's-square, Notting Hill. The whole of the rear premises is devoted to working purposes.

Since a previous visit, paid over twenty years ago, the ateliers have grown considerably in extent, owing to the scope of the business having increased; for whereas formerly it was mainly confined to the production of silver prints, this has, within a recent period, been supplemented by the introduction of letterpress and lithographic printing, the manufacture of photographic mounts in *carte*, cabinet, and every other size made use of in the profession, not to speak of the manufacture of gelatine dry plates, of the performance of which we have had occasion to write favourably only a few months ago.

As Mr. England has for some little time been resting on his oars, the whole of these businesses is now carried on by his sons, under the firm of England Brothers, and it is mainly of the newer departments introduced by them that we are now going to speak.

The various workshops and laboratories are in the rear of the residential premises. The first that we visited was the plate-making department. This has been specially fitted up in the most commodious manner, with all the recent appliances and improvements for this class of work. This department is under the charge of the younger son, Mr. J. Désiré England, who, in addition to being an experienced chemist and photographer, seems to make it a labour of love. We have already had occasion to speak concerning the good qualities of the England plate, hence no observations concerning them are now necessary. At the time of our visit, a collection of pretty little instantaneous views, taken by Mr. England, sen., on a tricycle, were being printed and got ready for the Photographic Society's Exhibition, on the walls of which they are now to be seen. Their inspection will give a stimulus to every photographer having cycling proclivities by whom they are examined. In the plate-making rooms the form of electric lamp introduced by Mr. England some time ago, and shown at the London Societies, is exclusively employed, and we were informed that it is found to be a great advance on any system of lighting previously adopted by them.

Some of the premises are devoted to letterpress and lithographic printing. This, especially the latter, is carried on primarily in connexion with the production of photographic mounts, in which a large business appears to be done. In the letterpress department all kinds of printing is carried on, including books, magazines, and photographic catalogues, one elegant illuminated specimen of the last of these now lies before us, sparkling with gold and coloured inks. So far as we saw, the lithographic department is mainly confined to the printing on mounts already referred to. It is doubtless the case that all kinds of mounts are here made, but at the time of our inspection operations were being confined principally to those with gilt bevelled edges. These we saw produced from the initial stage of being cut from the boards (which are got in five or six tons at a time), to the trimming, bevelling, gilding, and burnishing of the edges, and afterwards to the printing of the names and addresses on them in gold.

The production of lantern slides is a well-known feature of Mr. England's factory. It is safe to say that the exquisite beauty of some of these, more especially his statuary, has never been surpassed. They are produced by the wet collodion process, which Mr. England, in common with many others, holds to be one in which, when worked with knowledge and judgment, lies for transparency work the balance of advantages.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 13,186.—"Improvements in and connected with Diaphragms and Shutters for Photographic and other Lenses or Cameras." J. M. ELLIOT.—Dated September 29, 1887.

No. 13,332.—"An Improved Photometer for Measuring Intensity of Light in the Photographic Camera." J. DECOUDUN.—Dated October 1, 1887.

PATENTS COMPLETED.

IMPROVEMENTS IN APPARATUS FOR WASHING PHOTOGRAPHIC PRINTS.

No. 14,099. ALEXANDER KELLAR, Dinnfries Engine Works, Bute Docks, Cardiff.—November 2, 1886.

My invention relates to the construction of an improved apparatus for washing

photographic prints, and consists in a perforated cylinder capable of rotation within an outer vessel.

The cylinder has formed in it suitable openings at which the prints can be introduced.

I form floats upon the periphery of the cylinder, upon which a jet or jets of water play, causing the cylinder to revolve, and, therefore, carry the prints through the water delivered into the outer vessel.

The latter is fitted with suitable openings for the escape of the water.

The dynamic force of the jets above mentioned may be replaced or supplemented by any convenient type of mechanical motor.

Claims:—1. The combination of water tank, perforated washing cylinder revolvable therein by means of a jet of water admitted into the tank and discharging upon a water wheel combined with said washing cylinder, and an exhaust from said tank; substantially as described with reference to the accompanying figures. 2. The combination of water tank, perforated washing cylinder revolvable therein by a jet of water discharged on to a water wheel combined with said washing cylinder, a perforated central cylinder within said washing cylinder and communicating with the exhaust through a perforated bearing, substantially as described with reference to the accompanying figures. 3. In a revolving apparatus for washing photographic prints, the combination of a revolving perforated washing cylinder, a perforated axial cylinder extending from one end of the washing cylinder to the other, and an exhaust consisting of a tube embracing a perforated bearing and working watertight within a bush fixed in the end of the water tank, a centre pin supported by said bush and engaging in said perforated bearing, and an external tubular continuation of the said tube and bush adjustable for the purpose of regulating the level of the water in the tank, substantially as described with reference to the accompanying figures.

IMPROVEMENTS IN THE PRODUCTION OF COLOURED PHOTOGRAPHIC PICTURES.

No. 14,120. EDWARD WILLIAM PARKES, 3, Salters' Hall-court, London.—November 2, 1886.

ACCORDING to this invention, after having taken a negative in the ordinary way and produced a positive either by the carbon or other similar process, I fix the same with the reverse side of print on glass, opal, porcelain, egg-shell glass, or other similar material as a support, which has been previously waxed or French chalked and collodionised. I prefer opal, egg-shell glass, or porcelain, inasmuch as the photographic printer can the more readily discern the quality and various shades and tones of the print required, ensuring more general similarity of light and shade when a number of copies is required, and the painter or colourist can the more easily trace the lines and depth of colour required without the assistance of a paper support, desk, or other accessory, thereby securing more accuracy of detail in colours. Again, the egg-shell glass and finely-grained opal or porcelain impart to the photograph a very artistic and highly-finished appearance, saving the labour and expense of rolling, as usually adopted with photographs on paper or similar substances. The print is then developed on such support, after which it is allowed to dry, and the pellicle receives the required colours in flat tints (either oil or water colours), these colours being first suitably prepared, i.e., if oil colours (which I have found preferable) are used, I add a substance to bind the colours, that is, to prevent the colours from running into one another, and the medium I have found answer best in practice is three parts best terebenthine, one part pure mastic, a few drops of oil of turpentine thinned with ordinary spirit of turpentine. At times I add amber and best copal varnish in proportion of one to twelve, or jappaned gold size diluted with oil of turpentine. In the case of water colours being used, I employ sufficient ox-gall or similar medium for a like purpose.

I have found oil colours more suitable to my process, as I can lay the colours more flatly and evenly, and infuse the colour into the film by means of the fleshy part of the fingers, or by using a stippling brush pad, or similar contrivance, the brush having a tendency to cause unevenness and irregularity in the substance of the colour and destruction of the film which must necessarily destroy the value of the photograph. I then pour over the film and colour, slightly warming them, a solution composed of and proportioned as follows:—One part of borax dissolved in twelve parts of boiling water, to which I add an equal quantity of varnish made of white lac or similar substance and methylated spirits in the proportion of one to three. This operation fixes the colours and removes all greasiness of oil colours and bubbles, pimples, and peeling off the film, which otherwise occurs when the transfer is effected without this precaution. If jappaned gold size with oil of turpentine has been used in the earlier part of the process the use of the fixing solution may be dispensed with, unless the colours employed are of a vegetable character, when it should still be applied. A permanent support of paper sized and starched, or the ordinary transfer paper is then affixed to the pellicle by damping the paper in cold and warm water alternately, sufficient to cause the pellicle to adhere to the said last-mentioned support.

The pellicle and paper forming the support for the pellicle are allowed to dry thoroughly and then stripped from the glass and mounted on cardboard, opal, glass, porcelain, or other similar suitable strong and permanent support, the result forming a permanent and highly finished photograph in colours.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I would remark in conclusion that I am aware of several attempts having been made to produce coloured photographs by painting on the back of a carbon or other pellicle, and by afterwards stripping the coloured pellicle from the supporting glass, but all such attempts have proved practically unsuccessful, but what I claim as my invention, and desire to secure by Letters Patent is: The improved method, substantially as hereinbefore described, for the production of coloured photographic prints on a carbon or other equivalent film.

IMPROVED PHOTOGRAPHIC MOUNTING CARDS.

No. 5772. LEWIS WOLFF, 30, York-road, Battersea, S.W.—April 20, 1887.

My invention has for its object the saving of time and trouble required for preparing and using a mullage each time it is desired to mount a few photographs. I cause ordinary photographic card mounts to be made adhesive by coating

them with a solution of glue, dextrine, or other suitable material; the adhesive coating may be applied either with a brush or by means of one of the well-known machines in use for coating surfaces with thickened fluids; the cards are dried and are then ready to be used at any time.

To mount a photograph, take a print from its final washing, remove the superfluous water from it with blotting-paper, place it in position upon the coated side of the mount, and press the two into contact in the ordinary way.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—A card suitable for mounting a photograph, coated with an adhesive material in such a manner that when it has become dry it is capable of being used at any time in the manner as substantially described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
October 11	Newcastle-on-Tyne & N. Counties	Coll. of Physical Science, Newcastle.
" 11	Manchester Amateur	Masonic Hall, Cooper-st., Manchstr.
" 11	Derby	Sykes's Restaurant, 33, Victoria-st.
" 11	Bolton Club	The Studio, Chancery-lane, Bolton.
" 12	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 13	Birkenhead	Free Public Library, Hamilton-st.
" 13	Bradford Amateur	Grammar School.
" 13	Halifax Photographic Club	Mechanics' Hall.
" 13	Manchester Photo. Society	36, George-street.
" 13	London and Provincial	Mason's Hall, Basinghall-street.
" 14	Ireland	Royal College of Science, Dublin.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting was held on Thursday, September 29, at the Royal Institution,—in the absence of the President, Mr. J. H. Day took the chair.

The minutes of the last meeting were read and confirmed.

The SECRETARY acknowledged an invitation to the *soirée* of the Photographic Society of Great Britain, also some tickets for their Autumn Exhibition, which were at the service of any members intending to be in London during the time it was open. He also distributed prospectuses of the *Photographers' Indispensable Handbook*, by Messrs. Welford and Sturmeay.

It was announced that the Sub-Committee for arranging an exhibition and *soirée* had succeeded in securing the use of a room at the Walker Art Gallery for two weeks in March next.

Mr. Day exhibited an enlargement on opal of a group taken by him during the Ingleton excursion. The opal, executed by Messrs. Morgan & Kidd, was much admired.

Mr. W. B. IRVIN read a paper entitled *A Holiday among the Turks* [this will appear in a future number], illustrated by a number of whole-plate prints on Eastman bromide paper.

A unanimous vote of thanks was passed to Mr. Irvin, and, in reply to a question, he stated that he used a Ross rapid symmetrical lens usually (except the instantaneous exposures), $\frac{1}{4}$ stop, exposures generally five or six seconds, and Ilford plates.

Mr. E. TWIGGE showed some specimens of work on Obernetter's emulsion paper, exhibiting considerable variety of tone.

It was asked whether Obernetter's paper gave the best result with hard or soft negatives, and whether there was any difference between it and silver paper in the character of negative required to produce the best result.

Mr. TWIGGE stated that in his experience a rather soft negative gave the best print; such a one as would print well with albumen paper would succeed with emulsion paper.

Mr. TOMKINSON showed an album of views taken in Norway whilst with the Str. St. Sunniva, promising a paper on the subject at some future date, and Mr. C. M. Robertson exhibited a series of whole-plate enlargements on Eastman bromide paper from quarter-plate negatives.

MANCHESTER PHOTOGRAPHIC SOCIETY.*

Mr. TAYLOR then fittingly introduced the subject of distortion. That phase of it to which he confined himself was the projecting of straight lines as curves, the antithesis of orthographic or rectilinear projection. It is a condition in this class of projection that a ray shall emerge from the lens in a parallel direction from that at which it entered. To fulfil this condition it is necessary that it pass through the optical centre of the lens or combination of lenses employed. But the form of the lens often precludes the possibility of this, as the lecturer proceeded to demonstrate. Returning, he said the nature of the distortion is influenced by the position of the stop; when inside of the lens (that is, between it and the ground-glass) it causes pincushion distortion; outside, barrel distortion. The knowledge of this enables one to copy the most terribly distorted picture in such a way as to yield a result which is absolutely rectilinear. He wound up this part of his subject by saying that it was not material to the issue what particular form of copying lens was employed, so long as the diaphragm is in the position best adapted for giving a flat field and in the optical centre. As both these conditions cannot exist contemporaneously in the single lens, copying and architectural lenses must be compound.

RAPID DOUBLET.

Were he asked in what lens lay the advantage when contrasted with others, he would reply—In that of Steinheil. In 1866 Steinheil invented the Aplanat which, under other names in which the term "rapid" usually formed a prefix, was now more extensively employed than any lens extant. It has much

* Concluded from page 622.

to recommend it: It works with an aperture a sixth or even less of its focus, covers a fairly large field with a wide diaphragm, and with a small one a wide field, and is absolutely orthographic or rectilinear. It is commonly constructed of two kinds of flint glass, as density of material is a condition of the excellence of this class of lens. With light optical flint and crown glass excellent central or axial definition may be obtained with a large aperture, but density of material is essential to definition over anything like an extended field. Mr. Taylor then explained why it was requisite that the glass should be dense, and demonstrated it by drawings with the black board. From this, he said, you will perceive that the aperture of this lens is limited by the density of the glass employed. The greater this density the larger may be the aperture, while still retaining those qualities for which this lens is famous, viz., good transmission of oblique rays. But, unfortunately, glass of this enhanced degree of density is liable to decomposition and discolouration with more or less rapidity. He advised those who possessed lenses, for which a claim for very great rapidity is justly made, to be careful to keep them under cover from the action of light when not in use, as the glass of which they are formed contains so much lead or analogous density-conferring bodies as may ensure serious discolouration and consequent slowness of action before many years have elapsed. A lens having what may be considered a rather small aperture may work more quickly than one having an actual aperture larger in relation to its focus. He here repeated what he had said in another country and under different auspices concerning another, and too common a defect inherent in some of these lenses; that is, their tendency to give a ghost or flare-spot in the centre of the plate.

FLARE IN LENSES.

Lenses prepared by the best and most fastidious manufacturers occasionally show this defect, and in two lenses ranking in precisely the same category, one may have it, and the other be quite free from the defect. This often arises, singular as it may seem, from the very perfection to which lens-testing has been carried in the better class of manufacturing establishments. A watch dial placed at a certain distance forms the test for definition, and when the central or axial definition of the lens has been found to be correct, then is the eyepiece (one of great power) by which the image is tested removed in a line strictly rectangular to the axis until the image of the dial transmitted obliquely is found in line. It is here where the skill of the examiner is displayed. He has to adjust the lenses so as to strike the golden mean between flatness of field and astigmatism. It is a peculiarity of all combinations of lenses that if the field be made too flat, this quality is secured at the expense of astigmatism, or the inability of the lens to transmit an oblique ray under circumstances giving absolute sharpness. For example: If the object to be delineated near the margin of the plate be a white cross upon a dark ground, it will be found that when the vertical lines are focussed to sharpness, the horizontal lines will be out of focus, while by racking the lens in or out, to ensure the sharpness of the horizontal line, the vertical one goes so far out of focus as in many cases to vanish altogether, the full aperture of the lens being employed. It would be out of place here to indicate the methods employed by opticians to effect the necessary compromise between good marginal definition and flatness of field, but for our present purpose I may say that the distance at which the one lens is separated from the other is an important factor in such adjustment. But in aiming at securing that compromise in which lies such perfection as they consider attainable, opticians sometimes ignore an evil that, under certain circumstances, results from adopting the standard that they do. With the most perfectly corrected lens it often happens that when employed for out-of-door work, and used with a small diaphragm, there will be a distressing spot of luminousness on the centre of the plate. This is not peculiar alone to the cemented rapid lens, but was a well-recognised characteristic of the now unused globe lens. It is a peculiarity of almost every existing portrait combination, and sometimes, also, of single landscape lenses. When lenses are used in the studio, for portraiture or groups, it is never seen, but when a bright sky forms a portion of the included subject then it is apparent, but mainly so only when there is a small stop, for the smaller the diaphragm the more pronounced will be the flare or ghost-spot. There is no lens made, even the simplest magnifying glass, that has not two foci, one of them the principle focus caused by the refraction of the transmitted rays, the other being much closer to the lens, and caused by an internal reflection to which a portion of the light has been subjected. This it is which operates in the case of a ghost produced by a single landscape lens, and it is remedied by displacing the diaphragm from its position to the extent of from a quarter to a half inch, the ghost in such a case being an image of the stop, which is in one conjugate of the abnormal transmission, the sensitive plate being in the other. Disturb the relation of the first, and the second vanishes. This explanation does not meet the case where a combination is concerned.

HOW TO DISCOVER THE FLARE SPOT.

Premising that the ghost is only discernible when operating outside with a moderately bright sky, or when taking the interior of a church or similar building, he would repeat what he had recommended as being the best means by which to discover whether a lens possesses this propensity. Screw it on a camera and bring it into a room lit by a gas flame. Go to a distance of several feet and examine the flame on the ground-glass. The image will be sharp, bright, and inverted. Now move the camera slightly, so as to cause the inverted image to be a little to one side of the centre of the focussing screen, and in nine cases out of ten there will be seen a ghostly image at the opposite side of the centre. This secondary image is non-inverted, and upon rotating the camera it moves in the opposite direction to the primary image. The nature of this secondary image or ghost, and the cause of its formation, may be examined in the following way:—Move the camera so that the ghost shall be near the margin, and then, placing the eye in the line of that image and the lens, withdraw the ground-glass, when the posterior surface of the lens will be found to be quite luminous. That the false image is, in this case, caused by a reflection from the back surface of the anterior lens is demonstrable by unscrewing the cell containing it until it almost drops out of the tube, and then, keeping an eye upon both the primary and secondary images on the ground glass, move or slightly wriggle the front cell, which, by its being nearly unscrewed, may now be easily done, when it will be seen that when the primary or legitimate image of the flame remains motionless, the

ghostly image caused by the reflection from the front lens dances about all over the plate. But observe, further, there is a certain distance between the front and back lenses at which this secondary image is sharp and bright, and in proportion as either the front or the back lens cells is screwed in or out so does the image become more attenuated and expanded, till at last it ceases to be seen altogether, while all this time the real image is not seen to suffer in any way. This tendency of the ghostly image to pass out of focus with such extreme rapidity upon separating the lenses by a few turns of the screw or by making them come nearer each other provides the means by which this evil may be cured. A rapid doublet may be excellent for portraits, groups, copying, and every other purpose, and yet break down when employed with a small stop in landscape work.

IMPROVED MOUNTS.

The most generally perfect and useful mount for lenses of this rapid class would be that in which the privilege was afforded the user of making an adjustment to suit work of any nature by the separation of the lenses to a very limited extent, so as to be used under the most perfect conditions for the special work in hand. With a lens of about eleven inches focus a sliding adjustment of half an inch has been adopted with beneficial results. He then alluded in terms of high approval to a system adopted by Darlot, of Paris, in connexion with the adjustability of diaphragms. In one combination which he had from him in 1866 the stops, instead of occupying a definitely fixed position, were inserted in a second sliding tube inside the main mount, thus affording the means of effecting a separation of it from either the front or the back, according to the purpose for which it was being employed. You could have in copying either pincushion or barrel distortion, or an entire freedom from distortion at will, a feature of great value when a variety of lenses are to be used in one mount. It is obvious that with such a power at command a photographer can lay the ghost or flare spot with the greatest ease. Mr. Taylor had been repeatedly asked if one element of the rapid doublet could not be used alone for either covering a large plate or making a larger image of a distant object. He said certainly it could; but bearing in mind, first, that as the focus is now doubled the exposure must with any given stop be quadrupled; and, secondly, that the distance between the stop and the lens must be increased. Instead of inserting it in the slit in the tube bring it forward to the end and the marginal definition will be at its best. After speaking of the point from which the equivalent focus of a lens must be measured, and which was near to, but not quite at, the optical centre of a combination, and explaining why it was termed the *equivalent* focus, Mr. Taylor then treated in succession the methods of testing lenses for mechanical and optical defects, explained the principles involved in what he considered the misnomer of depth of focus, and spoke of lenses for special purposes, amongst others, that for detective cameras.

DETECTIVE LENSES.

While any of the generic "rapid" lenses would serve admirably for detective work in an open country or where there was good light, yet would they be found inefficient for a certain class of detective work for which he had a great liking, viz., the obtaining of instantaneous views of scenes in the dark, dingy courts and closes, in which squalor and its accompaniments were so frequently found, in London, at any rate. These scenes necessitated the employment of a portrait lens of considerable angular aperture. But it was unfortunate that portrait lenses when corrected for flatness of field gave marginal definition so low as not to bear subsequent enlarging, while if the oblique pencils were well corrected they gave a round field. In his experience there was only one way available by which the difficulty could be overcome, which was to employ a very ingenious invention of Piazzi Smyth, the Scotch Astronomer Royal, who some years ago made the discovery that by intercepting the rays by means of a plane-concave lens just before they reached the sensitive plate the oblique rays would be prolonged so as to reach the plane of a flat plate without suffering from astigmatism. (The speaker here submitted a diagram showing the position of Smyth's interceptor and the way in which the rays were influenced by it.) By no other means of which he was aware could a picture uniformly sharp to the margin be obtained by means of a portrait lens when worked with its full aperture; and Piazzi Smyth must be recognised as one who had made a useful departure from the beaten path of photographic optics.

THE LENS OF THE FUTURE.

Concerning the lens of the future, Mr. Taylor said it must possess at least one feature: with a fairly large stop it must cover a plate under such circumstances that there will be no appreciable difference between the centre and the margin of a plate as regards definition. No lens now in commerce would do so. One lens only has hitherto existed of which it could be said that the focal delineation of an oblique ray absolutely equalled that of the central one, and that was Sutton's panoramic lens, which was a sphere in every respect, the centre of the flint glass spherical shell being filled with water. But it was defective to this extent, that it necessitated the image being received not on a flat plate but on a hemispherical bowl. The lens of the future must propel a sharp image to the extreme end of a flat plate. Was such a thing possible? Two or three years ago he would have said no, and by employing the ordinary optical glass of commerce he would still say no. But he had recently seen and examined closely a lens produced by a firm of the greatest eminence, a lens in which this apparent impossibility had been most perfectly overcome; the focus of the oblique ray was absolutely equal to that of the central one, so far as it could be determined by a very powerful magnifier. They might accept his assurance as to this, for he had examined the lens under crucial circumstances. But as great difficulties still lay in the way of the commercial introduction of this lens, he would recommend these of his audience who were about to purchase lenses not to take any cognisance of the one referred to, but to secure the best at present in the market while still indulging the hope that the good time coming in which this lens could be commercially introduced would make its advent sooner than he himself could venture to anticipate.

During the course of the lecture Mr. Taylor made frequent use of the black-board to illustrate by diagrams his remarks, and concluded by stating that he

hoped if there was any portion of his lecture not thoroughly understood by any of the members they would allow him to give further explanation, and that he should be very pleased to reply to questions put by those present.

Many members availed themselves of this offer, amongst whom were Messrs. H. Smith, Robinson, McKellen, and the Hon. Secretary; and, in reply to Mr. Schofield, the lecturer gave some valuable information on lantern optics.

Mr. J. POLLITT proposed a vote of thanks to Mr. Taylor, and expressed the pleasure it had been to listen to so high an authority on photographic optics.

Mr. ABEL HEYWOOD, JUN., in seconding the vote of thanks, said, of all things in photography the study of lenses was to many about the *driest*, but the lecture they had just heard had been so extremely lucid that he felt sure everybody in the room must have been interested in the highest degree; and, from the explanations and replies to the questions that followed the lecture, he was sure much profit had been the result.

Mr. TAYLOR responded to the vote of thanks, and spoke in very graceful terms of the Manchester Photographic Society, "one of the oldest, ablest, and most energetic societies in the world."

Mr. Smith exhibited several stereoscopic pictures printed on silver paper which he had mounted in optical contact with glass and rendered transparent by various means. They looked almost as good as transparencies backed by ground-glass.

Mr. Blakely exhibited a number of very beautiful stereoscopic pictures taken during the summer.

Mr. Pollitt showed a negative of the interior of a church and the east window, the peculiarity in the negative was a second image of the window in another portion of the plate. Various opinions were expressed for the cause, the general impression being that the second image was the result of reflection from one of the lenses in use (viz., a doublet).

The Hon. Secretary exhibited a Kershaw shutter made for a pair of stereoscopic lenses.

A letter was then read from the City Waterworks Department cautioning photographers against the waste of water.

The Hon. Secretary distributed a number of circulars from the Photographic Society of Ireland relating to their forthcoming Exhibition. He also exhibited a very simple and apparently efficient print washer made by W. B. Osborn, of Birmingham.

Mr. W. I. CHADWICK said he had not yet tried it, but would do so and report at the next meeting.

Mr. W. WATTS gave notice in writing of a change or addition to the rules which he intended to propose at the annual meeting, to the effect that any member of this Society who should be on the Council of any other photographic society in Manchester should not be eligible for office in this Society.

Some little discussion followed, when the Chairman adjourned the meeting to October 13.

Correspondence.

THE AREA SYSTEM OF GEORGE SMITH.

To the Editors.

GENTLEMEN,—The courteous letter of Mr. Simon deserves a reply, and I will therefore respond.

I must, however, first explain the *rationale* of the whole affair. Although I have been actively engaged in photography for very many years, there was a very considerable interregnum during which it fell to my lot to have only to do with other folk's negatives. I had long formed the opinion that a very large proportion of them might have been vastly improved by a more artistic treatment in the camera, but it is but comparatively recently that I fully realised how simple this was.

The outcome of it was a camera with a long range of focus, and the *desideratum*—a set of lenses to suit it. I applied in vain to some of the most eminent opticians in this country and abroad, but they unanimously refused to entertain the idea, on the plea that it was contrary to their interests. I therefore had to set about it myself.

The result of my experience is, that for a lantern slide any lens of less focus than four inches produces a "picture" only on condition that the object it is intended to represent is not known. If it is known, the perspective is so strained that the view is not recognisable. On the other hand, a lens of about six inches focus is the most generally useful, while it is the only focus that will allow, and that not always, of a large stop. Further, that on frequent occasions much longer focus is useful—twelve inches or even more. Holding, moreover, the heretical opinion that exposure is everything, development being comparatively nothing, my object was, the greatest possible accuracy in exposure compatible with practical work. My camera has a range of thirteen inches, and could have fifteen (for a greater plate) if it were made square; but as this would increase the bulk I refrain from doing it at present, principally for the reason that vertical pictures on a quarter-plate are useless as lantern slides, while for portraits they are easily obtained by reversing the camera. I therefore use it, as a rule, horizontally, looking through the lens-hole to group my picture, racking out the camera till it is exactly framed by the rear end. This, by its position on the baseboard, approximately indicates the focus of the lens required to secure it. Theoretically, a large number of lenses are required; practically, five are ample, each used as a single lens at the rear end of the one mount; while if used as doublets, one is placed at either end, preferably, according to custom, the longer in front. They interchange by a bayonet joint with a quarter turn. I thus get nine foci; in other words, the church opposite my house, either the whole, with a house on either side, or only the

main door, with, of course, seven on intermediate scales, within the limit of a lantern slide, I find six stops, each double the area of the other, varying from about one-seventh to two-thirds of an inch, ample for all ordinary purposes with the nine lenses.

The set of lenses may vary according to fancy or the capacity of the camera, approximately, say, seven, eight and a half, ten, eleven and a half, and thirteen. The two longest form the longest possible rectilinear, the two shortest the shortest possible, and the five make four rectilinears of, approximately, six, five and a quarter, four and a half, and four inches focus, using in each case the longer in front and the next shorter behind.

The necessary adjunct to the lenses was a system of marking each separately with its intensity ratio, practically the area system.

If Mr. Simon will take the trouble to work out the area numbers of these lenses, and compare the foci of the several doublets obtained by the elaborate formula with the simple rule of thumb and very unscientific process of adding the area numbers together and dividing by eight, he will find that the difference is inappreciable, not nearly ten per cent. in any case, the area number being slightly the smaller.

Now, with regard to Mr. Simon's own experience. Having ascertained that the focus of his wide-angle doublet was seven and three-quarter inches, he correctly estimated its area number as ninety-six, and presuming that his lenses were of the extraordinary divergence he mentions, namely, ten and thirty inches respectively, he also quite correctly estimated their relative exposure values as 160 and 1440, one actually requiring nine times the exposure of the other. This convinces me that he is either an expert, and that he will realise the importance of the fact he has learnt by this measurement (though I fear he may not have the advantage of a range of focus to his camera to utilise the thirty-inch lens), or else that he is *somebody else*.

It is, of course, evident that the simple rule of thumb, of adding together the separate area number of any two lenses and dividing by eight, is not intended as a guide to solving the problem of the various focal lengths, which, admittedly, can be produced by simply changing the position of the two same lenses in the mount; but I venture to predict that if the area system should become as popular as I believe it deserves, no such combinations as a ten and thirty-inch will be employed, and that with more rational lenses the simple method I have advocated will be found sufficiently accurate to ensure its adoption. I have, therefore, no apology to offer for its unscientific character.—I am, yours, &c.,

GEORGE SMITH.

P.S.—Since the above was written I have inquired of Mr. J. Traill Taylor, who confirms my opinion that such a wide-angle lens as described by Mr. S(imple) Simon does not exist to his knowledge, and that if it does, it would be by no means a desirable acquisition. I, therefore, do not hesitate to challenge Mr. Simon's letter as a hoax.

MATTERS OF HISTORY.

To the Editors.

GENTLEMEN,—In page 602 of your valuable JOURNAL Mr. J. Solomon has unfortunately made a very awkward blunder in his recollections of M. Daguerre's early days of photography. Mr. Solomon says:—"Either about the same time, or shortly after the negotiation for the purchase of his secret, he went to England, and from the aid given him in London by a Frenchman named Claudet was enabled to obtain an English patent. The English patent was placed in the hands of an agent to sell, and although the French Government purchased the secret to give to the world, the English patent debarred the gift to the English nation."

The real fact is that M. Daguerre did not obtain a patent in England, although he patented his invention in other countries. After the invention was patented in France, M. Daguerre succumbed to the law when the nation took his patent from him for the use of the French people, the authorities compensating him for the loss of his rights. Mr. Claudet (a naturalised Frenchman residing in England, a glass dealer in Holborn, and who has been dead eight or nine years) observed that M. Daguerre had not patented his invention in England, then availed himself of the English law of patents, and obtained an English patent (No. 9193, 18th December, 1841), and practised in the Lowther Gallery, Lowther Arcade, London. Mr. Claudet was the first who applied chloride of iodine, which entered largely into the Daguerreotype process.

Then, later on, M. Daguerre came to England, and practised his invention in Regent-street, after which Mr. Claudet obtained an injunction from the Chancery Court, restraining M. Daguerre from using that which (although his own invention) was, under the circumstances, the sole property of Mr. Claudet; and not only the profits earned by M. Daguerre, but also all Mr. Claudet's costs of the suit, had to be paid to Mr. Claudet by M. Daguerre.

The statement "after Daguerre obtained his patent in England, he gave a written authority to Mr. Claudet to take pictures in London, without requiring any permission from the purchaser of the patent" is incorrect, inasmuch as M. Daguerre did not, and could not, give any authority, written or otherwise, to Mr. Claudet to use the patent in England, because Mr. Claudet had the *bonâ fide* property in the patent in England. Mr. Henry Beard obtained an improvement upon Mr. Claudet's patent, and it was said that he earned 100,000*l.* in England.

After the reading of the above, the writer of this cannot drop his pen without thinking of a few words, and carrying on the result of

M. Daguerre's invention. A young gentleman, who was articled to a chemist and did his daily work, employed his leisure hours in discoveries, and in secret mastering Daguerre, Tissandier, Thompson, Talbot, Beard, and Claudet. This young gentleman, in his own leisure hours, shortly before the termination of the apprenticeship, *gratuitously* and *openly* published his collodion process, afterwards called photography, and at the same time proposed the substitution of pyrogallie acid for the gallic acid previously employed in developing the image.

In the same year (1851) the present Photographic Society of London was instituted, with Lord Chief Baron Pollock, President; Sir W. J. Newton, Her Majesty's Portrait Painter, Vice-President; and Mr. Wm. Crookes, the Secretary (who is shortly to be knighted), were the elected officers.

Poor young Archer married, and shortly worked himself to death, leaving a widow and children, at which event some members of the Photographic Society subscribed 600*l.* for the bereaved family.

Wishing continuous success of the Society and of your BRITISH JOURNAL OF PHOTOGRAPHY—I am, yours, &c.,

Wm. Webb.

P.S.—Poor Archer deserves to have many of his statues in every city in the world.

[Our venerable friend, Mr. Webb, has slightly missed the point of Claudet's patent obtained in 1841. It was not for Daguerreotyping, as a process, but for certain alleged improvements connected therewith, such, for example, as the application of lenses of various size to a camera and the capability of using both large or small plates; in short, movable sliding fronts with lenses of short or long focus. A second item in the patent was the application of the vapour of mercury (the developing agent) within the camera, and which in his subsequent practice Mr. Claudet did not employ. The third claim was for a background of painted scenery; and the fourth, the application of artificial light, such as the limelight, in which the oxygen might or might not be charged with the vapour of sulphuric ether. These, it will be seen, do not touch the process of Daguerre, but are only improvements upon the practice of the process. Again—and we are really sorry to have to differ from Mr. Webb—when the Photographic Society was formed in 1851, it was *not* under the presidency of Lord Chief Baron Pollock, but of Sir Charles Eastlake, P.R.A., The Chief Baron was not elected President until 1856, and Mr. Crookes did not assume the office of Secretary until April, 1857.—Eds.]

PAINTERS v. PHOTOGRAPHERS.

To the Editors.

GENTLEMEN,—In the interest of the matter, kindly permit me a few lines in reply to "Free Lance's" epistle concerning my correspondence in last week's and earlier issues of THE BRITISH JOURNAL OF PHOTOGRAPHY.

"Free Lance's" tutor told him some stories about the battle of Waterloo. Well, my tutor related once a story about a gentleman losing his temper whenever contradicted in his assertions, and who, instead of proofs for same, gave strong words. "Free Lance" condemns my assertion that a portrait painter cannot have assistance by aid of photography as audacious and ludicrous, because there are painters who use photography as a help, although I proved such work to be nothing else than an imitation, and he himself pointed out a certain class of such productions as fraudulent, and related distinctly a case of this kind. But he gave no details of the circumstances which led him to his conclusion, and consequently, questioned about this particular case, I answer that I cannot form an opinion on such insufficient information. He blames me for this, and calls it impertinence. When "Free Lance" further thinks it a visible proof of the correctness of his first conclusion that in after years he was told "the faces went all black"—so can this, of course, only be an additional proof to himself, not to any one not fully acquainted with the secret circumstances which made him formerly sure of the committed fraud.

Concerning the blackening of paintings by keeping them in the dark, so are the meanings of experts divided, whether this result is the exclusion of light or atmospheric influences of the respectively closed rooms. Paintings excavated at Herculaneum were found conserved as fresh as if they had been painted yesterday, but changed rapidly after exposure to air and light.

Although I never mentioned a single word about the *technique* of oil paintings in all my notes, "Free Lance" denounces my "lack of practical acquaintance with the *technique* of oil painting as used by artists." He must have here again secret reasons, known only by himself, which led him to this conclusion. The remark about a varnish-maker starting business is too famous, as not to provoke the question why painters should be compelled to buy from a man who cannot supply the thing they want?

Finally, "Free Lance" says I am wrong in all what I said about second painting, &c., it being "little better than nonsense." If so, then a great many painters of my special acquaintance must be betrayed as I myself, notwithstanding long years of experience, and the fact that all my suggestions in my notes were, and are, only repetitions according to principles taken from the periphery of art academies of which we were, and some of us are still members, and then, *in nomine Patris et Minerve*

sanctissima, I humbly acknowledge I am beaten and we all were shamefully deceived. With gratitude to your forbearance—I am, yours, &c.,
A PAINTER.

[This subject has now received due elucidation.—EDS.]

AMATEUR PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—We shall be obliged if, through the medium of your columns, you will allow us to notify to those of your readers interested in our forthcoming Amateur Photographic Exhibition, that the sending in of exhibits has been extended for an additional fourteen days, and that the closing day is now fixed for October 20. Our reason for giving this extension of time is owing to the numerous letters that have reached us from amateur photographers stating that owing to absence from home they have been unable to develop and print their specimens. Allow us, at the same time, to remind those of your readers who are amateurs, that we have arranged with the Secretary of the Photographers' Benevolent Association to hand over to him intact all the entrance fees connected with this Exhibition.—We are, yours, &c.,

THE LONDON STEREOSCOPIC AND PHOTOGRAPHIC COMPANY, LIMITED.
54, Cheapside, E.C., October 3, 1887.

THE CORNWALL EXHIBITION REPORT.

To the EDITORS.

GENTLEMEN,—Mr. Brooks, as one of the Judges of the Royal Cornwall Polytechnic Society's late Exhibition, shows in your last issue that the report of the Judges has been tampered with in the columns of a contemporary, but he does not show to what extent or in what manner.

As one of those mentioned in the report, I may point out that there are not only suppressions of parts and alterations of words and phrases, but the editor has undertaken, without any explanation, the very grave responsibility of substituting his own words and opinions for those of the Judges, thus deliberately falsifying an official document.

An editor, I believe, may refuse to admit anything to his columns, but having accepted an official report for publication he is bound in honesty to print it in its integrity. Trivial omissions, perhaps, may be doubtfully justified (if explained) by want of space, but by what name are we to characterise the substituting of passages of his own of which the Judges knew nothing? To quote "J. B." in *Dombey and Son*, "one hardly knows what one comes to when one comes to that!"

A paragraph in which my picture was, perhaps, unduly praised in this report must have been extremely distasteful to the editor of the contemporary in question, for he entirely suppressed it and substituted one of his own which conveyed a different meaning to the original.

The moral of all this is: If we convict the editor of a journal, as is done in this case, of falsifying official documents, how are we to believe in the veracity or honesty of anything else written by the present editor of your once well-conducted and highly respected contemporary?—I am, yours, &c.,
H. P. ROBINSON.

Tunbridge Wells, October 3, 1887.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED:—

W. Crawford, 18, Wentworth-place, Newcastle.—Photograph of paddle steamer "Ivanhoe" arriving off Corrie.

T. Ball, 7, Comberton-hill, Kidderminster.—Photograph of Arley Church interior.

L. F. C.—See table of enlargements in the ALMANAC.

BOXWOOD.—It is our intention to have some articles shortly on photographing on wood.

J. McLEOD.—You may present a claim, but it is doubtful if the railway company will admit it.

A. B.—Any formula will answer if you use the equivalent proportion of the potassium salt for any other that may be given.

C. BANYARD.—See report of the Manchester Photographic Society in the present number. The Pall Mall Exhibition is now open.

F. & C.—The address of such firms as you desire will doubtless be obtained by writing to any towns in the pottery district, such as Stafford.

R. W.—The slides are made too dense in the development to begin with. Make them less intense; they will then require less toning, and the stain will be avoided.

HENRY STURMEY.—As we understand Mr. Gotz, his grievance is not so much against you as against the firm who appropriated his invention, and made a colourable imitation of its title. The matter had better rest here.

P. B. W.—1. Bad paste is evidently the cause of the fading. Acidity must have been induced.—2. For the irritation on the skin after developing, try the application of vaseline. Thanks for the fine pictures taken at the Convention.

R. WILSON.—The specimen forwarded is not a photograph or a photo-mechanical print, it is simply a lithograph printed in a colour to imitate a photograph and then varnished. A large business is done in these pictures at watering-places during the season. Many people purchase them thinking that they are really photographs.

H. B. A.—1. Messrs. Booth Brothers, Dublin, supply a very good mitering machine. Messrs. Marion will supply the other articles.—2. Yes, if the slide be altered to take the smaller size spools.—3. If ordinary paint will not answer your requirements the table might be covered with American cloth and neatly nailed over the edges. This can be easily washed and kept clean.

S. E. TURNER writes: "I have an oil painting to copy which is very old and indistinct as well as very yellow, apparently from the varnish having changed colour. How had I better proceed?"—In the first place carefully wash off the dirt with clean water and a little soap and dry with a soft cloth, next rub the surface over with a soft rag charged with linseed oil, which will bring up the colours; then copy on an orthochromatic plate, using a yellow screen with the lens. In place of the oil glycerine is sometimes used; but this is not good for the painting.

F. A. C.—1. As you have been getting on so well with the formula you have been using we should not recommend you to make a change. In the formula you quote the proportion of pyrogallic acid seems unusually large. Different workers often have pet formulae which they imagine are superior to all others. After all, much depends upon the operator.—2. We are pleased the article *The Effect of Moisture in Printing* has proved so useful to you. Bear the fact in mind if you meet with similar toning difficulties in abnormally dry weather.—3. The acid to acidify the sulphite of soda is much a matter of opinion; on the whole, sulphurous is the best.—4. Most retouchers use from H to HHH pencils. You ought to experience no difficulty in obtaining these grades at any artists' colourman's.

J. HAMPTON asks: "Can you please tell me the following?—1. I have got a lens by Ross for pictures $8\frac{1}{2} \times 6\frac{1}{2}$, rapid symmetrical, it is said to have an equivalent focus of eleven inches. I have no copying camera at present, so I do not know how large a map I can copy with the lens. I have a map sixteen inches square, and I want to photograph it the same size (sixteen-inch); will the above lens do for that?—2. How long bellows must the copying camera have to pull out for the sixteen-inch map?"—1. The eleven-inch focus lens will certainly not do for copying the map. One with an equivalent focus of at least twenty inches—twenty-four would be better—will be required. However, the copy may be made smaller in the first instance and subsequently enlarged; but unless this is skilfully done a loss of sharpness will be entailed.—2. To copy an object the same size, the camera must be extended to double the equivalent focal length of the lens, whatever that may be.

J. COURTIER says: "I carried out your instructions as regards the old silver, and find that the acids dissolve the strip of copper I put in to throw down the silver, so that I still get a coloured solution, but it is green. Is it possible to get the silver nitrate white like the nitrate of commerce? Will you also kindly inform me the best mode of crystallising and evaporating to dryness, with the proper appliances? Is there a table of exposures showing the difference in time of exposure for different size stops and work? also, where can I get a list of the standard stops with their diameters—in fact, a complete explanation of above?"—In reply: No doubt far more acid has been used than was necessary to dissolve the silver; however, sufficient copper must now be added to precipitate the silver; then, as we said before, the precipitated silver must be washed to get rid of the copper before it is re-dissolved. In this way colourless nitrate of silver may be obtained. To evaporate, place the solution in a Berlin evaporating dish on a sand bath over a Bunsen burner until crystals begin to form, then turn out the gas and allow it to cool. The crystals are now collected and dried. The mother liquor may then be evaporated to dryness, but from this perfect crystals will not be obtained. The tables will be found on pages 341-2-3-4 of our ALMANAC for the current year.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting, October 12, 1887, will be *Photography by Artificial Light*. Saturday outing at Hampstead. Meet at "Bull and Bush" at six o'clock.

CAMERA CLUB NOTICES.—Thursday, October 13, at eight p.m., Mr. Lyonel Clark: *The Selection of Lenses*. Thursday, October 20, eight p.m., Lantern evening. Mr. W. Brooks will show a series of lantern transparencies of interiors of Windsor Castle. Members are invited to bring slides. Thursday, October 27, eight p.m., Dr. G. Lindsay Johnson: *The Practical Testing of Photographic Lenses*. Members are invited to bring lenses to be tested.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1432. VOL. XXXIV.—OCTOBER 14, 1887.

INCANDESCENT GAS LIGHTING.

How to get the most light and the purest light from gas has long been a problem in the solution of which all are interested.

The incandescent system has for many years engaged much attention. Briefly speaking, this system consists in the employment of the heating powers of the gas, especially when mixed with common air, in bringing to a white heat certain bodies which, when thus rendered incandescent, emit a light more or less powerful.

In the early summer of 1868 we published a system of gas lighting introduced by a Frenchman, M. Bourbouze, in which a mixture of air and gas, the former under a pressure of seven inches, was propelled against a thimble or other shaped sheet of platinum gauze, which, being thus rendered incandescent, emitted a pure and powerful light. This was known as the Bourbouze lamp, or, more generally, as the platina gauze lamp. Although changes were rung upon its construction, and patents obtained for it since the time mentioned, yet has it never found general acceptance with the public, probably from the fact that the air had to be emitted under considerable pressure, necessitating the employment of machinery or some analogous means for its propulsion. In Mr. Lewis's lamp, described in these pages three or four years ago, the requisite degree of draught was obtained, when the light was employed on a domestic scale, by making use of a tall chimney, one from three to six feet in length, which proved inconvenient, although when thus burnt the light was a very excellent and steady one.

In order to ameliorate the inconvenience of this very tall chimney, we adapted the stand of one of Mr. Lewis's burners a small fan driven by clockwork, which supplied the air to the jet under conditions approximating those obtained by the elongation of the chimney; and when the lamp thus modified was placed in a lantern some good enlargements were obtained with a not unduly protracted exposure.

The recent improvements in incandescent gas lighting effected by Dr. Auer, appear to overcome the various difficulties hitherto incident to this kind of illumination. The Welsbach light, so termed from the residence of its inventor, while in general principle similar to those mentioned, differs from them in this important degree that, instead of the thimble or mantle which caps the flame and is by it rendered incandescent, being of metallic gauze, it is formed of a species of muslin made of cotton, which, after being impregnated with the salts of certain refractory metals, zirconium for instance, is afterwards subjected to a high temperature for such a length of time as suffices for the entire destruction of the cotton fabric, the mantle thus becoming converted into zircon. The advantage of this over the metallic platinum mantle, is that

the requisite incandescence is obtained by the admission of air which is not under pressure other than that induced by the current of gas with which it is mixed, under conditions similar to those which obtain in Bunsen or atmospheric gas burners of the usual order. Hence its applicability for domestic lighting.

We have been fortunate enough to see the preparation of the Welsbach burners from beginning to end, and shall endeavour as briefly as possible to describe it. The factory, which is situated in Westminster, within a few minutes walk from St. James's Park Station, seems to be very complete, and we saw in every room a large staff of *employées*, mostly young women. In one room we saw seven or eight machines of a nature similar to those employed in stocking weaving. By these the mantles were being manufactured from cotton thread and turned out in long gauze-like tubes, which were afterwards cut into suitable lengths and transferred to another set of operatives, who, by means of gold needles, stitched one end of each to a loop of fine platinum wire, by which they are afterwards supported when *in situ* in the burner. In connexion with the needles employed we were told that iron or steel would prove fatal to the subsequent efficiency of the mantle, and that too great care could not be taken to prevent these or any of the baser metals from touching them.

In another room these mantles, now about the length of one's finger and of a somewhat greater diameter, were "impregnated" by immersion in a solution which we understood to be that of zirconium, after which they were transferred to a drying room, where they were hung over glass rods. This room was strongly heated. When dry they were taken to the shaping and centering room, where by dexterous manipulation each was made to rotate, and "patted" into its ultimate form by a small platinum spatula and brought into centralisation. There being a Bunsen flame playing on the inside of the mantles they already at this stage began to emit a strong light, and we observed that several of the operatives thus employed wore coloured spectacles to protect the eyes. After this operation the Bunsen flame had, we were told, to be allowed to play on the mantles for two or three hours in order to ensure the last traces of the cotton being destroyed. In order to do this there were seven tables, on each of which there were about fifty lamps all undergoing this finishing process; the light thus emitted was intense, but the heat was not so great as would have been anticipated owing to perfect ventilation. When this operation was completed, the lamps were then transferred to a packing box and were ready for market.

According to the constitution of the impregnating bath, so is the colour of the light. When zirconium alone is employed the light is of a pure white colour, which, we were told and we

know it from experience, ladies rather object to, as they imagine it imparts a somewhat pale, if not sickly, tint to their faces in contrast with the yellow colour of an ordinary gas light. To meet this difficulty the mantles are made in two classes, one giving a white light and the other of a yellower and warmer hue. This latter is done by the addition of a salt of cerium to that of the zirconium.

For photographic purposes it is the white light that must be preferred, for reasons too well known by every one who is acquainted with the diminished action of coloured lights upon sensitive plates. While not of such a penetrating nature as some other lights, the Welsbach answers well for enlarging photographs by the lantern, and it is in this especially that advantage arises from the employment of a white light.

Although we have not tried the experiment, we imagine that by the employment of a battery of six or seven such lights judiciously controlled by reflectors and screens, there would be no difficulty experienced in taking portraits by its agency.

The "life" of one of these mantles is estimated to be a thousand hours of burning, at the termination of which time it can, of course, be replaced by another.

"TEN PER CENT." OR "ONE IN TEN" SOLUTIONS?

AN article by Mr. Lyonel Clark on *Ten per cent. Solutions*, reprinted in our last issue, is so well calculated to raise fictitious troubles in connexion with a highly convenient system, that we cannot refrain from drawing attention to it rather for the purpose of preventing its leading others astray than from any new information to be derived from it. We take this step the more readily because it was in the editorial columns of this JOURNAL that "ten per cent. solutions" now so universally employed were first advocated, and there also the modes of accurate preparation of such solutions have been frequently discussed.

The distinction Mr. Clark attempts to draw between "ten per cent." and "one in ten" solutions is one entirely without a difference, and is little more than an *ad captandum* argument to draw the unwary off the scent. A ten per cent. solution is a one in ten, and *vice versa*, whatever arguments Mr. Clark may bring forward to prove the contrary. It is difficult to grasp his meaning when he says that a "ten per cent. solution of a dry salt is really an impossibility," unless he means the statement to apply to the fictitious difficulty he has raised for apparently the sole purpose of laying it, namely, the conjunction of grains and minims. Forsaking for the moment our own uncouth system of weights and measures, does Mr. Clark seriously mean to argue that one hundred cubic centimetres of solution containing one gramme of "dry salt" is not strictly and absolutely a one per cent. solution in the clearest sense of the term? The attempted analogy between "a solution of ten minims of water by bulk with one grain of pyro by weight," and ten pears in a basket of one hundred apples, is illogical; while to say that "one ounce of pyro dissolved in ten ounces of water is without doubt a ten per cent. solution *by weight only*" is indubitably incorrect.

It may be, and we hope it is the case, that Mr. Clark has badly expressed his meaning. It is "without doubt" that such a solution would be a ten per cent. one neither by weight nor by measure; by weight it would be a nine and one-eleventh per cent. mixture, each ounce containing one-eleventh of an ounce of pyro, while by measure it would be

somewhere between a nine and a ten per cent. It has been over and over again pointed out in these pages that in making percentage solutions, or solutions containing definite proportions of the ingredients and which are to be used by measure, the proper way is not to measure out the full volume of solvent and add to it the full weight of salt, but to dissolve the latter in a portion only of the former, and then to make up to the required bulk. Mr. Clark can scarcely be ignorant of this, though again he does not express himself accurately in giving his directions for making what he calls a "true one in ten mixture," for he tells the reader, after placing an ounce avoirdupois of pyro into a graduated measure, to "pour into the beaker . . . if you wish to be very exact, nine ounces and fifty-five minims" of water. It is clear that by following the directions the volume of solution would greatly exceed the 4375 minims required. Mr. Clark ought to have said "pour into the beaker *sufficient water* to make nine ounces and fifty-five minims of solution."

The discrepancy between the subdivisions of the solid and fluid ounces, and its bearing on this particular question, appears to have long since struck those who have previously advocated the employment of solutions, so many minims of which are intended to represent one grain of the solid contents, call them what we will, though the matter appears only now to have attracted Mr. Clark's attention. Mr. H. B. Berkeley long since, in introducing the sulpho-pyrogallol developer, directed about eight ounces, or eight and a quarter of water, to be used with one ounce of pyro—a quantity which, with the increase of volume caused by the pyro and sulphite, brought it practically to a ten per cent. solution. Several makers of plates also direct an ounce of pyro to be dissolved to make nine, ten, or eleven ounces of solution, as the case may be, the first being for all practical purposes a "one grain in ten minims" solution, and the last one in twelve.

The solution containing one ounce avoirdupois of pyro in a volume of ten fluid ounces is, despite Mr. Clark's statement to the contrary, strictly and accurately a ten per cent. solution both by weight and volume, but the error is his of attempting to use the wrong system of volumetric subdivision. If, for convenience sake, he must dissolve an avoirdupois ounce of pyro at a time—and we wonder how often, when accuracy is a point, the one-ounce bottles contain exactly 437.5 grains—he should act consistently and obtain a graduate such as we have frequently recommended, namely, one divided into "grain measures" instead of into minims, and the last trace of the difficulty will disappear. If, on the other hand, he must use minims he must weigh out his pyro in accordance with the requirements of a ten per cent. solution.

But supposing we ignore the fact that one minim by measure of water is less than a grain by weight, what practical difference will it make in developing? The photographic chemist scarcely finds it necessary in *any* of his operations to strive after the minute accuracy of the analyst; certainly not in development, where the elasticity of the plates affords a very wide latitude, and less still with regard to the item of pyro. With plates of good quality variations of one or two hundred per cent. may be made in the quantity of pyro employed without producing any particularly disastrous results, while even with the most delicately constituted films we question whether a difference of twenty-five per cent. in the strength of the pyro solution would produce any difference in the result on the closest scrutiny whatever length of exposure is given, provided it is the same in the cases compared. What, then, would be the error in

dissolving one ounce of pyro to make ten ounces of solution to be measured by minims? We shall find on calculation that each minim of the solution contains '0911 of a grain of pyro, or a drachm contains five and a half grains nearly; that is to say that in mixing two ounces of developer to contain presumably six grains of pyro, we rob it of half a grain, or less than nine per cent. If we found that such a variation of the strength of the developer produced any appreciable difference in our results we should change our brand of plates for one that required less careful treatment.

Passing from the percentage solutions of solids, which, in the earlier portion of his article he declares to be an impossibility, though he afterwards somewhat modifies his view, the writer goes on to state that when dealing with liquids the difficulties immediately vanish, even with our English measures, as we are "then dealing entirely with one term, namely, bulk." The difficulties vanish because one has not the same power of raising them, unless, indeed, he goes to the trouble of mixing liquids of different specific gravities by weight and using them by volume.

But the statement that "one ounce of NH_3 " (how does he measure, weigh, or handle that, by the way?) "and nine of H_2O make up a true and correct ten per cent. solution" is, again, quite inaccurate, and is based on the fallacy that dissimilar liquids mix with one another without change of volume. Presuming that by NH_3 he means the concentrated solution of ammonia, he will find that if he measures out accurately the respective quantities named and mixes them they will occupy *less* than ten ounces, the volume decreasing in the act of solution. A simple and practical way to test this is to place a small quantity of strong ammonia and some water in a narrow-mouthed bottle, and placing the finger on the neck thoroughly mix by agitation. Upon attempting to remove the finger it will be found to adhere by the suction caused by the partial vacuum arising from the condensation of volume. As a matter of fact, it is of quite as great importance in preparing percentage solutions of liquids to make the solution up to volume as in the case of solids. If this were not the case there would be little need for the hydrometers of Sikes or Beaumé or Cartier, or of the elaborate tables of calculations that accompany them, and Boniface might "break down" his spirits with a tithe of the trouble it now gives him.

In this case, however, we do not imagine the difference would be of a fatal character if the expansion of liquids was utterly ignored; but as Mr. Clark writes as a purist in the matter of accuracy, we merely point out that his method does not give a "true and correct" result.

While on the subject of ammonia, and in connexion with ten per cent. solutions, we may point out where we think a better system than that now existing of titrating the ammonia might be adopted. Ten per cent. strength for the pyro and bromide solutions has been chosen because the decimal system has rightly or wrongly come to be considered the simplest; though, for many purposes, especially in connexion with development and other operations where drachms and ounces are used, twelve and a half per cent., or one in eight, seems to us to possess greater advantages. But when we come to the solution of ammonia, if we make a ten per cent. mixture of the ordinary '880 preparation, it is inconveniently bulky, and, besides, at the best we are basing our calculations upon a very uncertain foundation, as the so-called '880 solution is very rarely anywhere near that strength, and if it is originally it does not long retain it.

The suggestion we have to make is not a new one, as we believe we have made it before, certainly we have acted upon it in our own practice for several years. It is to base our calculation of the strength of the ammonia solution upon the *real* alkali, or NH_3 , it contains instead of upon the very uncertain quantity represented by "liquor ammonia '880." If this be done a solution of a specific gravity of about '960 meets the requirements, being a ten per cent. solution of NH_3 , and this is formed sufficiently nearly by mixing one part of the strong liquid of about '894 with two of water. In this condition it is far more stable and less dangerous, and it is practically the strength at present used for actual developing purposes. All we ask is that this be generally recognised as the "ten per cent. ammonia solution" instead of "one in three."

The majority of amateurs, of course, cannot be expected to mix this solution and adjust its specific gravity with absolute accuracy, but in following the data given above they will at least be no worse off than they are at present. But if the dealers would make a stock article of solution of this strength *accurately titrated*, it would be a far more uniform and satisfactory preparation than that now sold.

In view of the large number of amateurs who are constantly joining the ranks, and as Mr. Clark's paper is likely to circulate freely among them, we have thought it well to call attention to statements and suggestions which are, to say the least, misleading, and at the same time to point out that the proposed new term—"one in ten"—is a distinction without a difference, and therefore needless.

REMOVING AN ADHERING PAPER NEGATIVE FROM ITS SUPPORT.

A FEW weeks ago we received from Captain Murray, of Tyndrum, a large plate of polished ebonite, on one side of which was squeezed a paper negative which had resisted all his attempts to get it removed. We, too, tried various means to effect a separation, but all in vain. Numerous expert friends were consulted as to suitable means for disuniting the two, but without any successful result being achieved, which was the more to be regretted as the negative was a large and somewhat important one.

Other negatives than the one sent to us having behaved in the same untoward manner, a happy thought seemed to have occurred to the gallant Captain, which we express in his own language: "Since the receipt of your letter this morning, in my desperation I warmed one of the ebonite plates I have here with negatives stuck fast on them; and I am delighted to say that I have just stripped off the negative quite easily! I am anxious to know if the remains of the one I sent to you can be taken off by the same means."

On receipt of this information we warmed the ebonite slab by holding it before the fire, with the pleasant result that when the temperature was raised to a little above blood heat the hitherto intractable negative peeled off with the most perfect ease.

At first we and others thought that the adhesion of the paper to the ebonite was caused by a residuum of moisture in the film; but when after lying face up on a dry shelf for a fortnight the adhesion was still of a character as markedly tenacious as at first, this hypothesis was felt to be untenable.

Prevention is doubtless better than cure; and this evil may, in a great measure, be prevented by a thorough cleaning of the ebonite plate, followed by rubbing over it some French

chalk, previous to squeegeeing down either a negative or a print; but it is satisfactory to learn that even when things are at the worst they may be met by the simple expedient adopted by Captain Murray.

A CORRESPONDENCE of some importance as bearing on photographic interests is at present appearing in the pages of the *Athenæum*, and will no doubt be followed with some attention by those connected with the class of work discussed—Photogravure. A species of attack is made upon the process on several grounds—it is mechanical; prints *ad libitum* can be produced; engraving and etching will be doomed; engravers will become extinct; and so on. This is merely a repetition of the old story: portrait painting was to be a lost art, and miniature painting useless. But what is the truth of the matter? Portrait painting never in this country attained the perfection it now exhibits; the curtain and pilaster that were the stock-in-trade of the portrait painter half a century ago have been laughed out of existence by the photographic parodies, and it is a distinct gain that the Miss Creevys of art have been elbowed completely out of the way by photography. So we may anticipate it will be as regards "photo-engraving" and pure engraving; the producers of the "horrible, lifeless, and mechanical" things that Professor Herkomer speaks of will go to the wall, and the noble art of engraving will be the better for their absence.

SIR HOWARD GRUBB read a paper at the Mathematical and Physical Science Section of the British Association meeting that gave important information regarding the requirements of astronomical photography. He said, in considering the best form of object glass, it was desirable to have as large a field as possible. He showed the value of Professor Stokes's suggestion to have an interchangeable front lens to the objective of the telescope, so as to enable it to be used for either class of work. He stated that no matter how good a clock was employed to move the instrument, it had to be supplemented by handwork; he was able to correct, by present appliances, any error to the twentieth part of a second, and believed that greater accuracy was useless.

At a meeting of the same section, Professor Rowlands gave a description of a mainly photographic map of the solar spectrum, at which he had been working for several years with concave gratings, of which, starting at a focal length of twelve feet, he finally chose one of twenty-one feet. The spectrum produced by gratings, as is well known, is not subject to the crushing up of some and the expanding of other parts, like that produced with prisms, and, in consequence, he found that so many lines were crowded into the ultra-violet region that it would be almost impossible to determine to which metals they belonged. Photography here has enabled such great truthfulness and exactitude to be obtained, that Professor Rowlands found it necessary to make a new standard, the old Ångström numbers being found not to match and not to be consistent with one another. Captain Abney, however, deprecated the altering the standard of wave-length.

AGAIN, solar spectroscopy negatives, by Mr. G. Higgs, were exhibited, the instrument having been made by that gentleman himself. Some idea of the results may be gained when it is learnt that between lines H_1 and H_2 twenty-one lines could be counted, while in four inches of spectrum, including the spaces between G and H, from nine hundred to a thousand lines may be counted.

AGAIN, at this section Lord Rayleigh read a paper which had a most important bearing upon a subject recently dealt with by us in these columns, the reflection at the back of the glass. One great cause of halation, it is known, is the reflection, at the back of the plate, of light dispersed by film, and to prevent this reflection a vehicle approaching in refractive index that of glass, and containing a black pigment, was recommended by us, the former to prevent reflection at the junction of surfaces, and the latter to absorb the light. Professor Rayleigh's paper showed that no substance was a

perfect preventive of reflection, even when its refractive index was exactly equal to that of the glass. He found great differences in reflecting power in this respect between clean and dirty glass; but in all cases there was some reflection. He says, where dispersion exists there is no reason to suppose that reflection should cease merely because the refractive index is equalised. If recently fractured glass should give the same result, it might be safely concluded that there was no residual film in play, and there would then be no doubt of the inaccuracy of Fresnel's law. We need not point out the important bearing of these remarks on the present state of the theory of the reflection at the back of the glass as bearing upon halation.

THE PHOTOGRAPHIC EXHIBITION.

II.

WE now commence a review of the pictures at the Society's Exhibition.

R. B. Berry (No. 2), *On the Lledr River*.—This picture is not equal to those shown last year by this exhibitor. The point of view chosen when rendered in black and white is not one calculated to satisfy one's ideal of local colour, and the leading lines of the picture are not pleasant.

W. H. Hyslop (No. 3), *Yachts—"Thistle"*.—Four studies of the now well-known yacht "Thistle," and the largest direct photographs of sailing vessels in the Gallery. The close proximity of the camera to each vessel reveals a great mastery over the difficulties which must arise under such circumstances. It may be assumed that the sea was green in colour, therefore the resulting photographs are rather dark in that particular. The same remark applies to one picture where the land seems to come in front of the yacht, and it would have been as well if the contact of the sky with the top of this land had been softened down by photographic means rather than with a brush; however, the pictures are very successful.

R. Keene (No. 4), *Interiors*.—This and other pictures by the same exhibitor evince an experienced hand in depicting interiors and landscapes. In the latter, the platinotype tone chosen illustrates its peculiar adaptability for rendering gradations of distances, but for interiors we think that a warmer tone would have produced more satisfactory results.

R. H. Lord (No. 8), *Portrait of Baby*.—This is one of those direct large pictures to which allusion has been made as characterising the present Exhibition. There is this advantage, that the whole of the many scales of gradation in the negative are brought out, whereas if an enlargement from a small negative had been produced they would not be so evident, or possess that quality which is so difficult to describe but which conveys such a pleasant charm. The pose of this picture is natural, but is it also natural that one half of the face should be in strong shade when the study is supposed to be taken out of doors?

Henry Stevens (No. 9), *China Vases with Begonias*.—A beautiful specimen of very good photographic work, where great contrasts of local colour have been reproduced with singular delicacy and many graduated depths of transparency—being very perfect in all its scientific aspects, but at the same time showing very little artistic selection or control, the subject being vases, and other pretty objects, with some leaves. Why do not photographers, with all the advantages of orthochromatic plates, attempt to make pictures of various coloured flowers, fruit, &c., where artistic skill can be shown in the arrangement of grouping, and in the avoidance of so many simple diagrams of beautiful objects, but which become more so when the glamour of design and pictorial light and shade are brought to bear upon them?

Luke Berry (No. 11), *Humble Fare*.—We notice this photograph just to emphasise what we have just been stating—that a diagram is not a picture.

C. F. Pritchard (No. 15), *Three Giants*, being simply the tops of Swiss mountains, three negatives having been printed from to form a panorama—to some extent very well put together, but at the same time showing evidence of how it has been done. As a matter of fact, of course these tops must be absolutely true; but when we think of the appalling grandeur of the originals and look upon pictures like

this one, we are not moved. We have nothing before us which demands our sympathy, and, with all due respect, we cannot tell what the extent of these *Giants* may be—whether they are only a few inches (as possibly might be modelled by some pieces of coal) or occupy a very considerable amount of space.

Matthew Whiting (No. 16), *Scotch and English Views*.—Twelve small pictures, which are far in advance of those shown last year by this veteran exhibitor, being very good in their photographic result, and in the two middle pictures very well selected and pictorial in form and general aspect of light and shade, the cows in one picture being remarkably good when considered in connexion with the other portions of the scene.

G. P. Cartland (No. 17), *Windsor Jubilee Celebrations*.—A medal has been awarded this series, stated to have been taken at eight p.m. In all, the merit must consist entirely in the production of a good chemical result by skill and good manipulation.

J. B. Hillditch (No. 20), *St. Paul's Cathedral*.—What would the Society's Exhibition be without the annual view of St. Paul's by this exhibitor we cannot say; but it must be admitted that the present picture is very fine in its character, and at such close quarters to have managed the equalisation of the focus implies a knowledge of the optical portion of the appliances, which has resulted in a very fine picture, which also is a good example of enlarging upon bromide paper, the bluish tone admirably suggesting the original itself.

G. Watmough Webster (No. 21), *Eaton Hall*.—A frame of four interiors, in platinotype, which assists the delicate detail of the work in a very marked way; but we think that for pictorial purposes a little warmer tone would be better, the present results suggesting their being shnt up in portfolios.

W. W. Winter (No. 23), *My Mammy*, and (No. 60) *Dada's Tick, Tick*.—We put these two pictures together, as they invite being noticed on account of the same results in each. There is much delicate treatment of the white draperies, but the flesh tones are sacrificed in consequence; and here we will allude to the powerful effect for good or evil which mounting has upon the print. In these instances, if the mounts had been darker in tone than the dresses, the effect of the picture would have been most wonderfully enhanced.

W. Wainwright, jun. (No. 25), *Views*.—These consist of four very fine, well-chosen pictures, in platinotype. They are very pictorial in effect, and suggest the notion that they are engravings from paintings. In these works we have again exemplified the value of platinotype in rendering gradations of distances. The picture with cows in it is a beautiful example of force and delicacy united. Then, again, the warm tint upon which they are mounted gives value to the photograph which it surrounds. Altogether, these exhibits are very choice and good.

Harry Tolley (No. 30), *On the Lonely Shore*, and many other pictures from the same exhibitor. Here we have a series of nine pictures, all in platinotype. A medal having been awarded to No. 30, the subject being a rocky headland, making, with a foreground, a bay, on which the moaning sea for ever rolls. One solitary figure sits in the foreground and looks towards the projecting rock. Altogether, this picture commands our sympathies, and we look at it and wonder why it should be so. Here we have an artistic work in photography which is something more than a bare record of facts. All the other exhibits are very good, being most excellent work as far as the appliances go; but there is one, a snow scene, which conveys some little sentiment. Two small figures intensify the effect of snow everywhere. Altogether, this series is most successful, both from the technical and artistic point of view.

J. Blain Scott (Nos. 36 and 37). *Portraits*.—Here we have instances of platinotype assisting a negative in producing better results than with silver printing. The work by this exhibitor this year is far in advance of previous exhibits, and this, we think, is due to the fact of platinotype giving more atmosphere than silver, and consequently there is an absence of those unfathomable depths of blackness which we recollect to have formerly seen. The pose of each figure is very natural, but we must once again object to the white mounts, which give the high lights on the pictures a dirty look.

F. W. Edwards (No. 39), after G. Tinworth.—This, and another exhibit of a similar subject, are good examples of photographic work

direct from the artist's original clay designs, and also are cleverly printed in platinotype, where the colour has been most judiciously adapted to the subject portrayed.

H. P. Robinson (No. 40), *Carolling*.—Once more we have an exhibit from this master in composition photography, and which, if looked at with educated artistic knowledge, will satisfy both the requirements of the painter and the photographer. The subject consists of two females traversing a common, whose shadows on the grass convey the fact of their being on a slight incline, and singing a carol as they go. In the background are some sheep grazing, and at the extreme distance a rather low horizon of small trees, which insensibly fade into the sky, which is kept very quiet, the whole suggesting spring-time, when all things have an undeveloped character about them; and a tinge of sadness pervades the figures, who must be compelled by the surroundings to sing "sotto voce." Well, in short, this is the poetry or sentiment of the picture, and well has it been carried out. Thus far the painter will recognise art, and the photographer will appreciate the difficulties overcome in the arranging and printing from several negatives, as also the choice of the colour (platinotype), which throws another idyllic charm over the whole of the picture, which has been most artistically conceived, and, photographically, exceedingly well carried out.

THE APPARATUS.—I.

THE apparatus on exhibition this year having been selected by a Committee from a considerable quantity sent for the purpose, there is a proportionately greater number of novelties in this department than could possibly otherwise have been the case, as we understand that novelty was a factor in the principle of selection, conjoined, it need not be said, with efficiency.

We are pleased to observe among the names of exhibitors several whose productions appear here for the first time.

Roller slides and detective cameras are present in noticeable force and variety; camera stands combining the qualities of portability and rigidity; shutters having every degree of instantaneity of action; cameras replete with ingenuity; camera cases; plate boxes; bottle cases, and even photographers' watches, together with numerous appliances to facilitate working—all have a place in this collection.

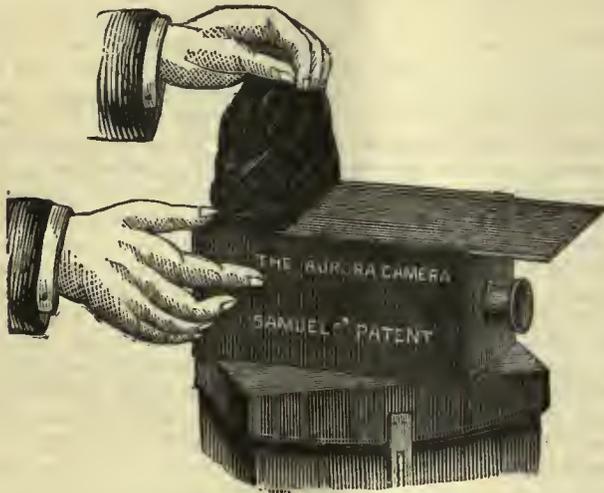
Under the name of the "Aurora Camera," we find a very unpretending-looking camera of the detective class, exhibited by



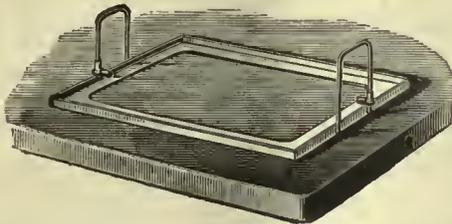
H. Sharland, who is understood to be the manufacturer and wholesale agent. It is designed by Mr. Samuels, several of whose patented appliances are utilised in its construction. When folded up it forms a square box of such small dimensions as, if wrapped in paper and carried in the hand, might easily be mistaken for a box of cigars. The camera contains at the back a reservoir capable of holding twelve or more sensitised plates, quarter-plate size, and by a very simple contrivance they can be exposed one after the other without any danger of the unexposed plates being affected by the light, and there is no complicated mechanism to get out of order. The focussing is effected by a concealed lever which is moved to marks indicated by the distance of the object to be photographed.

When the first plate in the series has been exposed a button outside of the camera is run up in a sunk groove, by which the exposed plate, in its sheath, is raised up in a thin opaque bag, so as to be grasped by finger and thumb and transferred to a receptacle at the back of the others, the next in order taking its place at the focal plane. The cuts

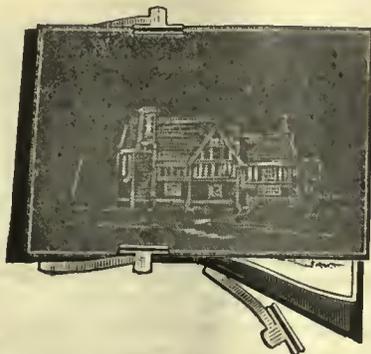
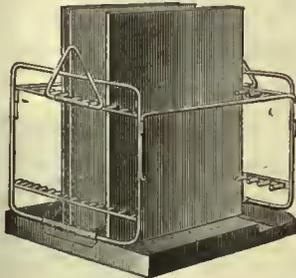
above show the camera both when closed and open, although in practice the lens does not protrude through the front as shown.



Some exhibits of Mr. William Tylar, of Birmingham, next claim attention. One is a series of portable developing trays, formed of



Willesden paper, or, more correctly, cardboard. These trays, of which we gave some account in our issue of the 23rd ult., are employed in connexion with a very convenient plate-lifting frame, by the aid of which every operation, from development to the final washing of the plate, can be performed without the fingers coming in contact with either the plates or the chemicals used. The drawing shows its construction. A plate-washing frame is also exhibited by Mr. Tylar. Of this we also append a drawing. The serrated edges by which the plates are kept separate are protected by indiarubber, rendering scratching impossible. It is constructed of japanned wire. A metal printing frame is also shown by the same exhibitor. Spring clips, as shown in the drawing, serve to keep the negative in close contact with



the metal back, and to permit of the progress of the printing being observed with facility. Tylar's metal dark slides are likewise exhibited, but they are now so well known as to need no description.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

NEARLY every enlargement, no matter how carefully produced, will be found to require the assistance of the brush to endow it with a finished appearance. There are very many systems of enlarging, but none which gives to the *plain* enlargement sufficient effect or brilliancy to be independent of the brush or pencil. In the process of enlarging, no matter how perfect the original may be, many blemishes will be sure to assert themselves which will require rectification at the hands of an artist. Sometimes the general texture of the whole picture will present to the eye a most unnatural coarseness; other times this coarseness may be local, simply limited to the face. In the former case the *quality* of the original (that is assuming the enlarging to have been properly done) will be responsible for the result, but the latter, in most cases, may be traceable to the carelessness or want of skill on the part of the retoucher who had the working up of the original negative. So long, however, as the *likeness*, in the latter case, has not been greatly injured, a little skilful work with the brush will set everything right.

In the working up of an enlargement it is a matter of the utmost importance that we should secure a *tint* approaching, as nearly as possible, to the tone of the photograph we are about to work upon. Indeed, this tint should be exactly the *same* as that of the photograph, or else we may fail to produce a harmonious whole when finished, and so have no reward for all the time and labour we may have expended on the *working up*.

There are many combinations for securing the tints best suited for working up these enlargements, but two or three will suffice to be given upon this occasion. Assuming that the enlargement we are about to work upon is the *usual* photographic colour, the following will be found equal to the task of matching all shades of the same. Naturally if the photograph be of a warm tone, the warmer colours will predominate in the mixture, while, on the contrary, should it incline to a [cold tone the cooler colours must necessarily assert themselves.

Almost any tint may be obtained by the skilful mixture or combination of *lampblack*, *lake*, and *warm sepia*. Another very useful and good tint may be made by the help of *neutral tint*, *sepia*, and *brown madder*; colours which lend themselves to almost any tint that may be required. The combination which finds most favour upon the Continent is *principally* formed from *lake*, *Indian ink*, and *neutral tint*. I said "*principally*," and that may appear strange at first sight; but I will account for my saying so. Artists' colourmen in Germany have introduced a combination of colours which they term *photographic colour*, that is a tint somewhat resembling that of the ordinary photograph. There are several shades of this colour, some warmer and some cooler, but I have always found that they wanted *toning* before using, as *by themselves* I do not consider them a success; but they are exceedingly useful in combination with the three last-mentioned colours. Many of the best artists prefer using *burnt carmine* as their red.

For a short time carbon enlargements became somewhat fashionable printed in a red pigment with the intention, when worked up, of resembling some of the old red crayon drawings by some of the old masters. They are very pretty and effective, but of late have not found very much favour. To work them up a judicious combination of *Indian red* and *brown madder* will be found sufficient. These two tints are the *most general* for enlargements, but sometimes they are printed the exact tint of *sepia*, sometimes *warm sepia*, in which cases these colours used in their purity will suffice. In carbon enlarging almost any tints can be produced, and when such are of different shades from those just mentioned independent judgment must be used in matching the colour.

Before starting work, indeed it is the first thing to be done, pin the photograph to your drawing-board with the ordinary drawing-pins. It is a great advantage keeping your picture flat. It is very advisable, too, to keep a piece of soft, clean paper over the lower part, upon which you can rest your hand while painting without any fear of damaging your work. The fact of resting your hand upon the *surface* without anything to protect it will inevitably cause it to become greasy, and so almost impossible to work upon; even if you succeed there is always the fatal result of looking patchy.

* Continued from page 613.

In working up enlargements, you should always be provided with guides, that is to say, duplicate photographs. These you should place in such a manner that you can, without trouble, constantly refer to them. I may paraphrase the old saying, "Two heads are better than one" very truthfully by saying that "two guides are better than one;" one should be printed lightly to enable you to render the detail in the shadows, the other printed deeply in order to give the form and drawing (if any) in the lights.

Retouching of late years, as every one knows, has been considered almost indispensable to the production of successful modern-day photography, and when well and properly done is a decided advantage. I regret to say, through competition and bad pay, this branch of photography has fallen into considerable disrepute. The one who has no mean cause of complaint in this regard, is the colourist who has to work up an enlargement from a badly retouched negative. When a negative is *over* retouched (a very common occurrence), the likeness must inevitably suffer. In many such cases the resemblance is quite destroyed, but in all such it must be very seriously interfered with. I do not wish to be misunderstood in this particular regard, so beg to draw attention to the fact that this does not refer to really *good* retouching, but to the ordinary—I may say *very* ordinary—and cheap work as patronised by a large number of photographers.

Such work may be tolerable in the smaller sizes, but when it is enlarged it becomes impossible. A guide taken from such a negative is really useless, and following such while working up your picture will inevitably lead to failure. A hard struggle should, under such circumstances, be made to secure one or two prints from the negative before it is retouched. You will be well repaid for your struggle by the saving of alterations and worrying complaints.

Before starting with the colour, it is advisable to wash the surface with water passed over it with a large brush, to see how it takes; if evenly, let it dry, and it will then be ready for work. If the surface present a greasy or uneven appearance, there is a prepared size, Newman's, I believe, which is well adapted to rectify this. A wash of ox-gall will also give a clean surface to work on.

In working upon albumenised paper or carbon tissue, it will be found necessary when mixing your tint to include a little gum-water, in order to assimilate somewhat to the gloss upon the surface natural to such prints.

In the case of a very bad enlargement it may be necessary to pass a wash of colour over the major part of your picture, and then proceed in the way I will indicate for a more or less decent enlargement. Take your brush, a sable, and one not too small, and with a small quantity of the tint you have mixed begin to fill in any white or offensively light spots that may be in your photograph. Don't try to fill them in such a way that they will become flat or patchy, but with a view to breadth and effect. This refers naturally in most part to the background, coat, &c. This treatment will partake somewhat of the stipple, but when the defect is large, and so beyond the power of the *stipple* to mend, you must hatch over the defective space and afterwards even up with a stipple, if such be necessary.

The colour in use should never be too moist, still it must work easily in the brush; also very little colour should be used at the time.

If the photograph under treatment should be an enlargement from a very small or faded original, there will be considerably more trouble than in the case of an enlargement made under more favourable conditions. The surface will be found to present a general mottled or coarse appearance, all of which must be taken away before we can produce a pleasing result. With your brush very moderately filled with colour you must patiently and carefully proceed to even up all these inequalities; in other words, tone down the light spaces until a moderately even appearance is given to the entire picture. When working upon a carbon surface it will be found advisable at times to take out some of the darks with a knife, but more of that later on.

When you have carried this operation to a certain extent, take your guide and very carefully examine it, and compare it in detail with your enlargement, looking up and mending all the deficiencies that present themselves. These will be mostly observable in what may be termed *exaggerations*, imperfect drawing, and a general tendency to hardness of outline. There are at times such successful enlargements as to want but very little, simply brightening up and strengthening.

I mentioned "*hardness of outline*" just now, and a word or two on

that subject may not be amiss. It is laid down that in nature there is no such thing as an outline, or outer line, and on close observation the truth of this will become apparent. One *tint* meets another and melts imperceptibly into it, yet both are separate and distinct. A strongly cast shadow upon a light ground will be found to be simply the termination of the shadow, but it would be impossible to depict it by means of a hard line. Outline is, as it were, the boundary where one tint ends and another begins—the edge of a shadow; but in no case can a hard line represent itself. In the monochrome, when there is no help derived from the balance of one tint against another, as in coloured work, the tendency to outline is very remarkable, and must in the treatment of the enlargement be so subdued as not to be offensive to the laws of nature.

One will often find in enlargements (some processes more than others) that the shadows meet the lights much too abruptly, also that there is a general lack of half tone. In cases where this is very strongly marked, a faint wash may be passed over the entire picture, picking out the lights by removing the colour with a dry brush; or, better still, allowing the whole to dry, and then with the point of a piece of ink-eraser restore them. This faint wash will only impart a general tone or softness to the picture, but will not be sufficient to blend the shadows into the half tones. If your shadows are very strong they must be rubbed down with an eraser, and then the edges worked or stippled until a general harmony and roundness is secured, and which can only be the result of the proper gradation of tint. So much for the picture generally. We will now take it in detail, and examine the different treatment demanded by each feature.

REDMOND BARRETT.

(To be continued.)

STEREOSCOPIC PHOTOGRAPHY AND ITS REVIVAL.*

ONE of the first, if not *the* first point the photographer should give attention to, if he desires to obtain the most perfect effects in stereoscopic work, is the distance at which his lenses are mounted apart on the camera. Very many of the pictures sold in the past, and which helped to destroy the popularity of the stereoscope, were defective only in this respect, and that chiefly because the operator either in ignorance or carelessness treated every subject in precisely the same manner. Let us then consider the effects produced by varying the distance of the lenses.

As I pointed out in connexion with the stereoscope itself, the distance of the lenses apart for viewing the slides may be fixed, as owing to their size and to the fact that it is not necessary to look through the precise centre of the glasses, a fixed position will suit eyes placed at widely different distances. In the stereoscope, in fact, the distance of the lenses is chiefly a matter of comfort and exercises little influence on the appearance of the picture. In the camera, however, it is altogether different, the distance between the centres of the lenses deciding the amount of stereoscopic relief presented by the combined pictures, and this practically independent of the amount of separation existing in the mounted slide. A moment's reflection will show that the separation of the lenses on the camera front, or in other words the diversity in the points of view from which the two dissimilar pictures are taken, settles once and for all the amount of dissimilarity existing between them, and that the same amount of divergence is presented to the eyes when the pictures are viewed in the stereoscope and the same idea of relief conveyed to the brain, whether corresponding objects in either picture are two and a half or three and a half inches apart when mounted. The only difference in that respect is again one of comfort; the nearer the mounting distance is to the actual separation of the eyes the less will be the strain produced in their combination.

Naturally the best or proper distance of the two points of view is that of the eyes themselves, and if a fixed front is used and the points of view are to be the same for all classes of subject, near or distant, two and three-quarter inches will be found generally the most convenient. But the optical effect may often be improved by artificial means—that is, by a departure from absolute truth. Of course, the wider apart the points of view the greater will be the dissimilarity in

* Concluded from page 568.

the pictures, and the closer the objects the greater will be the effect, owing to the larger angle subtended. In gazing naturally upon a landscape, though the observer is sensible of a considerable effect of relief in the foreground objects, it becomes inappreciable as the distance increases, and, however rugged and broken may be the distant mountain side, it appears to the eye smooth and flat, because the axes of the eyes, when directed upon objects at such a distance, include so small an angle as to be practically parallel. In proportion as that angle is increased by separating the eyes, if that were possible, or the lenses in the case of a photographic camera, so will the dissimilarity between the pictures and the sense of solidity and relief be increased. So for landscape work, especially of the type known as "open," the natural distance of the human eyes may be departed from to a very considerable degree, and for very far-removed objects the two views may be taken from points many yards apart. Thus the Warren de la Rue's stereoscopic pictures of the moon, published many years ago, were taken on different nights, or under circumstances owing to the alteration of the relative positions of earth and moon equivalent to a separation of the points of view by thousands of miles.

For landscape work solely it is advisable to have a good distance between the lenses, say three and a half or four inches or even more, and it is even allowable to have them fixed in that position because the exaggerated relief conferred upon foreground objects will not prove unpleasing. But for portraiture, groups, or small near objects, such an arrangement would be utterly unsuitable, the effects produced being grotesque in their want of truth. For instance, many years ago, I purchased, second-hand, a stereoscopic camera that had been specially constructed for a then leading amateur landscapist and in which the lenses were adjustable from four and a quarter to five and a quarter inches apart. For landscape purposes the instrument was all that could be desired, but upon using it to photograph a small statuette or group, including a seated female figure, I was startled to find her represented with a capacious lap extending to several yards, a chin projecting quite a yard, while from the top of the nose to the lip was a good foot.

Therefore, I consider that a perfect stereoscopic camera should be provided with an adjustable front enabling the lenses to be separated from two and three-quarters, or, better, two and a half inches to four or five; in fact I hold the adjustable front to be a *sine quâ non*.

Next I come to the question of the best focal length for the lenses. There is no best, but the focus should be suited to the subject just as in monoscopic work. A pair of short focussed lenses will exaggerate the perspective of distant views, making mountains into molehills and foreground pebbles into gigantic rocks, while on the other hand lenses of too long focus will give with near views and "bits" which form some of the most charming subjects for the stereoscope, flat and jumbled-up pictures which only resemble carvings in low relief. It has been suggested that these defects may be remedied by viewing the finished pictures with lenses of the same focal length as those employed in their production, but how many people will find that their stereoscopes and cameras fall in with that convenient arrangement, or will think it worth while, like Mr. Chadwick, to adapt their photographic lenses to the stereoscope? It is better to have a selection of lenses to suit different subjects and to adhere to one pair for the stereoscope; or, where a single pair must suffice for the camera, to select a medium focus, say five to five and a half inches. A full equipment may range from three inches for interiors to seven and a half or even eight for distant views and marine studies.

Another important item is to see that the lenses are accurately mounted upon the camera front at precisely the same height from the base line of the plate. If this is not seen to, endless trouble will be experienced in trimming and mounting. I do not attach a great amount of importance to the absolute "pairing" of the lenses. I once had a pair of about four-and-a-half-inch focus that differed fully three-sixteenths of an inch and which I had to focus separately, but I could never find any defect in the combined pictures produced by them, nor did I ever experience any inconvenience or strain in looking at them.

Special importance is attached by some to the necessity for accurately levelling the camera in taking stereoscopic pictures, but beyond the reasons that prevail in connexion with single pictures I am aware of no others that affect a double picture. I have heard i

argued that a want of level in the direction of the plane of the picture or from side to side, will prevent the combination of the pictures in the stereoscope, but this is not the case, for if the two pictures be taken from points one above the other, instead of side by side, they will combine perfectly if properly mounted, though without proper stereoscopic effect. Even if the double negative be taken with a considerable slope from left to right, if the prints be trimmed properly no ill effect will accrue beyond the greater trouble involved in the trimming.

As regards levelling in the direction of the axis of the lens, or what is known as "tilting," the effect is precisely the same as in the case of a single picture, and when it is absolutely necessary to resort to tilting, the swing back must be employed. Nothing looks worse than a stereoscopic slide with leaning perpendiculars.

From various reasons in the old dry-plate days, and with wet plates as well, difficulty was frequently experienced in bringing the two halves of the negative to the same density, and consequently one half of the print was often much darker than the other. This might arise from defects in the optical arrangements, but was more frequently due to the collodion film being thicker at one end of the plate than the other, or to the developer having been applied unequally. These reasons are not new likely to prevail with gelatine plates, though another cause of unevenness between the two halves may now be found. In former days, with exposures counted by minutes, there was no difficulty in removing and replacing two caps so as to give practically equal exposures to either half of the plate; but, now when the time is reduced to a second or two, the feat becomes almost an impossibility, and some form of exposing shutter is a matter of absolute necessity, whether for instantaneous or "time" exposures. This presents no particular difficulty, except that in the case of an adjustable front for the separation of the lenses the shutter must work independently of the lens mount.

What has to be performed in the way of exercise of care in these matters referred to in connexion with the camera is done once for all, but when we come to trimming and mounting the prints it will be found that individual attention must be given to each one, and it is, perhaps, to the want of observance of the irksome little niceties in these operations that the imperfections of the great majority of stereoscopic slides are to be traced. But, after all, the trimming and mounting of a stereoscopic slide is as rapidly and accurately done as a single one, if done methodically. The following is the method I adopted for years, and by which I was able to trim or mount from three to four dozen prints in an hour.

The first thing to be done before cutting the prints is to mark them, that the respective halves may be subsequently identified. To do this lay the print face downwards upon the cutting-glass and mark the halves as they lie "R." and "L.," the left-hand half when looking at the face will thus be marked "right," and *vice versa* as required. The next operation is to provide a correct base line from which to work. The line of the rebate of the dark slide is often taken, but if the camera has not been level this will only be the commencement of trouble, for one print will be cut a trifle higher, or will contain a trifle more subject in the foreground than the other, and when mounted will either refuse to combine properly, or cause considerable strain on the eyes.

My plan is to select two corresponding objects in the foreground of the two halves of the print, a stick, a pebble, a turf or blade of grass, a flower, or any of the thousand and one such objects that may be found in any picture. Lay a straight edge against the two prints selected, and cut a clean bottom margin or base line. Now, whether the camera has been level or not, we may be sure that the two prints are cut level, and the worst fault that can happen will be a slight leaning, imperceptible except in architectural subjects, but no doubling of the image or strain on the eyes.

Now fold the double print in the centre, face outwards, using the new base line to secure accuracy, and with a suitable cutting shape trim the two halves at once, employing a sharp knife to ensure clean edges. It is in the trimming where a large amount of judgment is required in deciding and arranging the distance apart of similar objects in the two pictures when mounted. This distance does not necessarily coincide with the width of the trimmed picture, as it would do if each half contained precisely the same amount of subject

and they were mounted close together. On the contrary, the distance between similar objects is usually less than the width of the print, and this is arranged by so cutting the prints that the outer margins of the mounted prints, that is the right-hand side of the right picture and the left-hand of the left, show a small amount of subject that is not included in the other half. This has the advantage that it makes the picture when viewed in the stereoscope stand back from the mount as if looked at through a frame.

The distance of the corresponding objects will depend upon the distance of the lenses apart and the size of the trimmed print, and may be readily altered or adjusted by placing the cutting shape nearer to or further from the centre or fold of the doubled print; that is to say, the nearer the dividing line between the two prints is approached in trimming, the nearer will be the corresponding objects in the mounted prints, other things being equal. Thus, in the case of my $7\frac{1}{2} \times 5$ camera with the lenses placed in the centre of each half of the plate, i.e., at a distance of $3\frac{3}{4}$ inches between their centres, I find the following are the variations produced, supposing the prints to be trimmed to three inches square. Cut one-eighth of an inch from the fold or division line, mounted objects are $2\frac{1}{2}$ inches apart; a quarter of an inch, $2\frac{3}{4}$ inches; and three-eighths of an inch, three inches, which is as far apart as can be comfortably combined. These distances will of course vary, other things remaining the same, if the size of the trimmed print be altered, the difference being equal to what is taken off or added to the width of the two prints.

Variation of the distance of the lenses also will affect these figures, the nearer the lenses are placed the more distant will be the mounted objects. In landscape work then, it will be seen that it is advantageous to place the lenses as far apart as possible or convenient in order to secure the full stereoscopic effect. Whatever may be the size of the plate, perhaps the best general distance, if it has to be fixed, will be three inches; if adjustable, let the adjustment be from $2\frac{1}{2}$ inches to as much as can be obtained.

With regard to the size of the trimmed prints, I think the appearance of the slides is much improved by cutting the photograph as large as possible. I cut mine 3 inches wide by $3\frac{1}{2}$ high, and these dimensions, after allowing for the expansion of the paper in mounting, leave a margin at either end of three-eighths of an inch, and a little less than one-eighth at top and bottom. The inelegant appearance of many of the old slides trimmed to two and a half inches square was very noticeable, and arose from the use of small plates, sometimes as small as $5\frac{1}{2} \times 3$, and the difficulty of working clean to the edges. With gelatine plates I should think it would be possible to work the old "stereo size," $6\frac{1}{2} \times 3\frac{1}{2}$, or even $6\frac{1}{2} \times 3\frac{1}{4}$, and still trim to the size I have named.

I had intended saying something on the subject of transparencies, but have exceeded my space; I may at a future period return to that very charming branch of photography, as I fully believe next season will witness a real revival of the stereoscope.

C. BECKETT LLOYD.

COMPOSITION IN LANDSCAPE PHOTOGRAPHY.

Just the day for photography! The wind is still, not a breath shivers the delicate leaves of the Lombardy poplars; the sky is not quite cloudless, for numbers of small clouds float lazily over the blue, affording varieties of lighting, either all sunlight, all shade, or, by careful waiting and observation, a little of each—often useful when softness and sparkle are wanted in the same picture. I don't think I can do better than imagine you are with me. It may be like a legal fiction, most convenient. Besides, you know the scenery.

Fill your slides, look over your camera to see that everything is in order; for, however sure you may be that everything is right, it is always well to have an inspection before marching. To forget a screw, if you have a loose one, and only discover your loss when you are miles from home and the view before you is "perfect," is to promote possibly suicide, or certainly profanity. There are some things better left at home if you unfortunately possess them. One of them is any kind of actinometer. I never knew anything but harm from this instrument when used to help you to judge the exposure. Another perfectly useless worry can be got out of "exposure tables." It takes all the "go" out of a picture if you have to do a sum in arithmetic when you ought to be concentrating all your heart, and mind, and soul, on your subject. Knowledge of

exposures must come by experience if they are to be of any use. No calculations based on length of focus and stops are of any service to a practical photographer. All other things being equal they would be an infallible guide, but otherwise they are misleading. After the plate has been exposed and the excitement is over, it would be useful to make a few notes for further guidance. Such as kind of plate, lens, stop, and length of time, also of the light, and nature of the scene.

Besides the apparatus there is another very important help to picture making which is seldom thought of—some models. It does not matter much what kind they are, whether old men, young girls, or children, or mixed; the one thing of the utmost importance is that they shall be appropriate to the scene, for there must be no suggestion of sham about the finished results.

The illustration, which was done on a day that turned out unfit for good work with the camera, shows some of my models. A painter is making use of one of them, while two others are looking on.



We will have a lofty beginning to-day. Let us go to the top of the mountain—Moel-y-plas—a hillock you called it, with your transatlantic contempt for little things, but it is 1442 feet 8 inches high, according to the minutely exact calculations of the Ordnance survey, and at least affords us that sense of standing on a round world spoken of by the author of *Adam Bede* as one of the outdoor delights she most cared for. Shall we find a picture here? The hill is glorious with purple heather just coming into flower, green ferns and bracken, mingled with the orange and brown of last year's decay. New life springing from death. As we ascend we startle a covey of grouse which go whirling down the valley. We need not mind them now; next month their turn will come. The land dips into valleys all around us; to the north the lovely vale of Clwyd, beyond which, afar off, is a glimpse of the pale grey sea; to the south the Llanarmon valley running for miles in the direction of Chester; and to the west the grand range of mountains known as Snowdonia. We are standing on the oldest bit of Britain, from the geological formation down to the Druids. The scene calls up memories which every Welshman loves to dwell on. There rises up before us in mental vision Llewellyn and his dog, Owain Glyndwr, and King Arthur and his round table; but this is not what we are here for.

Where are we to point our camera? I cannot see anything that will afford a good subject. A magnificent view is before us "palpating with actuality," but it is beyond our reach. It would be impossible to give any adequate representations of these distant hills, they would be dwarfed into insignificance, and, if relied on to come on the same plate as the foreground, overexposed to the verge of blackness. The foreground is insignificant in itself to make a picture, and the view, as a view, consists of the valleys and mountains. So we must remember the limitations of our art, and give up the impossible—but don't pack up the camera, for here comes our picture. Here is a group of children, five of them, gathering bilberries; we will give up the mountains for the present, and make a picture of the children. We will send one of our young-lady models to make friends with them, and rub off the edge of their shyness. That she is dressed in shabby clothes will be in her favour, the children will be more natural and familiar with her. We will select a spot where the undergrowth is not too dense, but broken up with plain patches of turf or bare earth. You have already made up your mind roughly how the group shall be arranged, have placed the camera approximately on the right spot, and roughly focussed, pulling out the top of the swing-back before focussing so as to get greater depth of definition from foreground to distance. Two children to the right

of the picture, three to the left, and to make a principal point, the trained model not quite in the middle of the picture, but a little to the left of the centre, and nearer the camera than the others. Let the principal figure be standing with her left arm outstretched over a large basket looking to the ground on the left, as if searching for berries or talking to one of the children. She, knowing what is expected of her, will not stand in an awkward attitude, resting equally on both feet, but you may rely on her when you have given her the leading idea to carry it out instantly. The sun is shining to the left front of the model, throwing out the figure dark, but touched with a brilliant edging of sunlight against the distant mountains. Take care in exposing to lift the cap as if it were hinged to the top of the hood of the lens, for it will then act as a sunshade. If the least touch of sunlight rests on the glass during exposure the plate will be hopelessly fogged. It is with the children that the trouble comes. This, however, we get over with a little patience, taking care that each figure appears to be as unconscious of the camera as possible. Now expose. Two, or perhaps three seconds.

That stupid child looked up just as you took off the cap to see why you are keeping her waiting so long. Quick! another plate before she is aware you mean another. That is the picture. It is often the second shot that brings down the bird.

To succeed with a picture of this kind requires quickness of decision and the faculty of seeing at once what ought to be done, and promptly acting on that insight. The photographer also must be able, without hesitation or waiting for words, to say, or oftener to shout, the right thing at the right time to the model. In fact the life of the picture depends on your doing absolutely the right thing in several directions on the spur of the moment. This faculty can only be attained by long practice, good knowledge of composition and light and shade, and keen observation of effect.

The illustration will serve to show the kind of rapid sketches you should get into the habit of making of any subject or arrangements that may strike you. They need not be accurately drawn or exhibit



any graces of style, all that is wanted is rapid notes and hints for future use. I have purposely introduced a weak point in the composition so that I may point a lesson. The composition is divided into two groups which seem to have no connexion. The attempt to join them by the addition of the basket is a failure. The lines are fairly right, but there is a want of unity—fatal to the picture.

In the picture described above the figures predominate over the landscape; we will now reverse the effect, and the landscape shall be of the most importance. We won't give up the mountains now we have taken the trouble to climb so high. Let us see if we can get a good picture by taking it on two plates instead of one. Some people say that combination printing is not quite orthodox, but let us break away sometimes, it is awfully dull to be always correct. It is not easy to an active mind to be satisfied with "the priceless merit of being commonplace." The difficulties of the subject before us are these: We have a near foreground of comparatively dark and non-actinic character, a blue sky with some small, strongly defined clouds, a distance composed of grey-blue mountains, and a middle distance; this latter part of the scene, however, is a long way off. The problem is, how to combine these apparently incompatible elements, giving the least prominence to the foreground. No lens would get the foreground and distance together with anything like a passable focus, and no dodging of the exposure afford both the widely different times they would require. These difficulties are easily surmounted by combination printing. Get the immediate foreground on one plate with an exposure of, say, ten seconds (for you will use a small stop), and all the other parts of the picture on another plate, and with an exposure, say, of one second. These exposures are only approximate. It would be better in practice in taking the distance to move the camera forward a little so to take in more than is required, this will facilitate the joining. I have fully described the various methods

of combination printing which may be of use to the landscape photographer in *Silver Printing*, and it would scarcely be worth while going over the subject again here.

H. P. ROBINSON.

—*Photographic Times*.

THE IDENTIFICATION OF CRIMINALS BY PHOTOGRAPHY.

THE *Observer* says that "The question of the best means of identifying habitual criminals is most important as a practical means for the repression of crime. In France and throughout Algeria they have adopted the *signalements anthropométriques* of M. Bertillon. His system consists of taking the measurements of certain bones which do not alter after manhood has been reached, such as the length and width of the head, the length of the little and middle fingers of the left hand, of the left foot and forearm, and the height of the body. Scars and marks, the colour of the eyes and hair, are also noted very carefully. Now M. Bertillon has found in his practical experience by the measurement of nearly 50,000 persons that the measurements of no two of them are alike. The instruments used, though inexpensive, are so accurate that the diameters of the head and the length of the fingers are measured to within one millimetre. One, however, of the most important advantages of M. Bertillon's system is the power it gives of classifying, by the aid of measurements, the photographs of habitual criminals. The photographs are divided into three classes, according to height—the large, the medium, and the small. Each of these classes is again and again subdivided, according to the length of the head, the width of the head, the length of the middle finger and left foot, into sub-classes of large, medium, and small, so that instead of looking through 50,000 photographs it is only necessary to examine ten to twelve, and if the portrait wanted be in the collection it can be found as quickly as a word can be looked out in a dictionary. The officials employed in the searches now make use of the figures alone; they satisfy themselves of the absolute similarity of the anthropometrical descriptions to a millimetre before they even look at a photograph, lest they should reject the right card through being misled by a deceitful resemblance. Since the introduction of the system nearly five years ago there has not been one single error of identification, and the number of prisoners recognised as giving a false name and *etat civil* has been 1500. Germany, Spain, Italy, and Denmark have adopted M. Bertillon's system, and it will probably become the recognised means for criminal identification throughout the world."

OPINION OF THE LONDON PRESS ON THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[*The Graphic*.]

THIS year's Exhibition of the Photographic Society, though in some respects of a higher standard of technical excellence than its predecessors, is somewhat disappointing from a popular point of view. The multiplicity of portraits reminds us forcibly of the "Photographic Artist's" waiting room, while the yacht studies though interesting, as showing what instantaneous photography can do, are apt to become monotonous. At a time like the present when amateur photographers, to whom avowedly the recent marvellous improvement in photographic science is mainly due, are doing such excellent work at home, abroad, and in the colonies, surely it would be worth the while of the representative photographic society to make an effort to fill their walls with a more varied and more wisely chosen collection than that now on view in Pall Mall. We all know pretty well the stage of excellence which has been reached in the studio, and in country rambles within reach of home and a dark room, but specimens of photographs taken in a campaign, in the difficulties of travel, and in rarely visited lands under exceptional circumstances would be interesting alike to professionals and amateurs. It is for this reason that J. W. Lindt's admirable pictures of New Guinea are exceedingly welcome in the present Exhibition. They are well taken, and prove what good work can be done with the camera by geographical explorers. Alfred Isenberg shows some interesting views of Benares, and coming a little nearer home Miss Georgina French has some charming views of Venice. Messrs. Robinson and Thomson send a number of small photographs of *Picturesque Italy*, which deserve especial praise; while W. F. Donkin and Captain Abney both send some striking Swiss mountain views. Of English subjects there are some particularly good photographs of Thirlmere and Derwentwater, both by T. A. Green and H. Colliss Pettitt; numerous characteristic views in the Isle of Arran by Vernon Heath; a very pretty bit of foliage, *Holy St. Devon*, by T. M. Browning; some clever notes on the Norfolk Broads by Payne Jennings; and a wonderfully extensive view of Moel Wyn from Festiniog by Charles E. Nesham.

Foremost amongst the "picture" subjects is the *Carolling* of H. P. Robinson, which has excited considerable difference of opinion amongst photographers, but which, taken as a whole, must be praised for the gracefulness of its composition and the delicacy of its execution. Most of the others still retain that stiff, stark look about the figures which has ever been the stumbling-block in this branch of photography. Amongst the best are *A Finishing Touch*, by Lydell Sawyer; *The Potter*, by W. Thomas; *On the Lonely Shore*, by Harry Tolley; *Darning*, by John

Terras, after Adam Diaton's well-known style; *Dat's a Lubby Shine*, by G. B. Wood; and, not least, country cottage studies by George Davidson, whose delicacy of printing in platinotype almost equals the effect of steel engraving. As we have said, however, it is in portraits that the strength of the Exhibition mainly lies, and prominent amongst the chief exhibitors are W. J. Byrne & Co., whose photographs taken direct at Lady Hood's house, are no less admirable than their life-size heads—to the latter of which the Judges have deservedly awarded a medal. E. Davey Lavender send some winsome full-length portraits of a little girl, H. S. Mendelssohn a graceful group of Mrs. Longstaff's children, V. H. Chintamon some Indian celebrities. G. West & Son, as usual, are distinguished by some good yachting studies, as also is W. H. Hyslop. Animal subjects are chiefly represented by A. R. Dresser, who shows a curious study of the sea-lion, and Thomas Fall, whose dog portraits are very good, while some instantaneous views of gulls in flight by Benjamin Wyles should serve as a lesson to many a marine artist. Of the scientific photographs we should mention the photo-micrographs of Andrew Pringle and of Fred. E. Evans, and the lightning photographs taken during the August thunderstorm by E. S. Sheppard. There is a great lack of architectural subjects, but we cannot conclude without giving a passing word of praise to S. H. R. Salmon for his interior of St. Bartholomew the Great, to G. Watmough Webster for his interior of Eaton Hall, and to Richard Keene for his interior of Hardwick Hall. One of the chief novelties is a scene from *David Garrick*, photographed by ordinary gaslight, by John F. Roberts, which has gained the distinction of a medal.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 13,505.—“Improvements in Apparatus for Washing and Drying Photographic Negatives and Photographic Pictures on Glass, Part of such Improvements being applicable also for Washing Photographic Prints.” J. H. JEFFERIES.—*Dated October 5, 1887.*

No. 13,566.—“Improvement in Instruments or Cameras for Photographing Distant or other Objects.” R. BIRD.—*Dated October 6, 1887.*

No. 13,725.—“New or Improved Means for Setting or Cooling Photographic Emulsions on Glass or other Suitable Materials used as a Support for Photographic Emulsions.” J. W. T. CADETT.—*Dated October 10, 1887.*

PATENTS COMPLETED.

IMPROVEMENTS IN CAMERAS.

No. 13,240. JOHN EDWARD THORNTON, 3, New Lorne-street, Moss Side, Manchester.—*October 18, 1886.*

THE objects of the improvements which are the subject of this invention are for a twofold purpose, hereinafter more definitely described; firstly, for facilitating the packing and unpacking of cameras and getting them into position for work, by reducing the number of loose parts; and, secondly, for facilitating the adjustment of the various parts when in use by providing more conveniences than hitherto for the operator. This invention is intended to form an addition, to be taken in connexion with my Specification dated the 24th February, 1886, and numbered 2670.

In constructing a photographic camera according to my invention, I form the baseboard with a circular opening in it as large as convenient without unduly weakening the parts; to the under side of this baseboard I attach another board of a suitable size and shape (which I call the turntable), and having a corresponding opening a little smaller than the one in baseboard, so that a projecting ledge is formed on the turntable on the inside edge of the opening. To this projecting ledge on the turntable I attach a ring or flange of any suitable material, but preferably of wood. This ring just fits easily in the baseboard opening, and comes nearly flush with the surface thereof. A thinner flange or ring, preferably of metal, is attached to the top edge of the wooden flange and overlaps the surface of baseboard just sufficient to form a binding projection to keep it in its place. The baseboard can thus revolve freely on the turntable, and a set-screw passing through the wooden flange and working into the metal one serves to clamp the baseboard and turntable together to keep the baseboard from revolving except when required. The order of attaching the flanges may be reversed if desired, and any other materials may be used for their construction, but I prefer them as herein described.

The under side of turntable may have recesses therein into which are inserted plates for attaching the legs to. These recesses and plates I place near the edge of turntable and extend them so as to come right up to the edges and be visible from the edges thereof. In the plates I form <-shaped recesses, the wide end of each coming to edges of turntable and the narrow end terminating in a hole into which the leg pin fits. The leg pins can thus be more readily placed in the holes than if the position of holes had to be looked for underneath the turntable, as the pins may be pushed in from the edges, the recesses guiding them to their places. This method is only applicable to those legs which have projecting pins thereon. For those legs having a fixed stay-pin or bar at the upper extremity I form the turntable with spring jaws to engage with the same as follows:—The stay-pin fits into a hollow or groove on the under side of turntable, and a spring metal catch, having a corresponding groove on its upper edge, presses against the turntable and holds the stay-pin in position in groove, at the same time allowing it to move tangentially. This device may be placed near the edges of turntable so that the stay may be pushed in between the jaws easily.

The usual extension frame of baseboard is worked by the usual racks and pinion, but I arrange the pinion so that it can be thrown out of gear with the racks and the frame pushed in or out without tedious racking. The end-bearings or plates in which the pinion works are slotted in such a manner that the pinion may fall sufficiently to just clear the teeth of racks when pushed

down. A small spring at either end of pinion, on the under side, operates to press it in gear with the racks, and a plate or other device, which may project to the outer edge of baseboard, is placed over pinion, so that it may be pressed down thereby.

The front board, which carries the lens, is caused to travel backward and forward as described in the before-mentioned specification. The bearings of the top pinion which works the front are formed in travelling angle-plates or runners, and the slotted stretchers which support the front are pivoted at their lower ends to these runners. The fork carrying the front is constructed so as to swing either backward or forward on its lower extremity as a centre, being pivoted by any of the following methods:—Firstly, the two bottom ends of fork have each a small boss attached, the said bosses being each cut part away, forming at their lower extremities a half circle, so as to fit on to two shoulders formed on the pinion. Two short tubes are smoothly fitted on the pinion, also a spiral spring which works in the space formed between the two ends of tubes, and serves to press them apart. When the fork is placed in position on the pinion the tube ends spring on to the bosses or inner edges of fork, and so lock the fork on the pinion, at the same time allowing it to swing thereon. A projecting pin on each tube provides for drawing the tubes together when it is desired to detach the fork. Secondly, the sides of fork may be held rigidly apart by a hollow bar or half tube which will fit on to the pinion and lock thereon by catch springs. Thirdly, two flat springs, each having a small hole therein, may be attached to the runners and the fork provided with projecting pins to fit into the said holes, and so form pivots for the fork to swing on. Fourthly, the fork may fit on pinion, as described, and pins or bosses on the fork engage with springs attached to the runners to lock the fork on the pinion. Any other method of locking may be used which is found suitable, and I do not bind myself to any one of the methods described herein.

The sides of fork are slotted, and the front is made so as to rise and fall between the fork, being fixed at any height by two milled-headed screws, which pass through the slots in stretchers and fork and work into the sides of front board. These screws serve a double purpose, as when tightened they serve to hold the front board firm and rigid by means of the stretchers, and also to fix at any height, as described. When they are slackened the fork may be swung to any position. The front board is kept from swinging or vibrating between the sides of fork by pins or screws inserted in its sides and working in the slots in fork.

The front board is fitted with a revolving panel to carry one or more lenses (as described in the before-mentioned specification). A spring attached to front is made to engage with revolving panel so as to prevent it from revolving when not required. The top portion of front board above the revolving panel is so constructed as to slide or lift out, so that by raising it up a little the panel may be removed when necessary. A brass ring or flange may be attached to front so as to cover the edge of panel, and so effectually prevent light entering at the joint. This ring may be cut in two, so that the upper half may be attached to and rise with the sliding portion of front board. A cover or plate may be fixed to the front board behind the lens not in use, and acted on by a spring or other device, so as to effectually exclude any light from passing through the said lens and at the same time not interfere with the free movement of the lens panel.

The extension frame of baseboard is made sufficiently large to allow the front board, fork, and stretchers, to go down into the recess or space formed therein. In order to get this recess large enough, instead of the usual wooden rails on the upper surface of baseboard for the purpose of guiding the extension frame, I construct the said guiding rails of angle-brass and attach them to the sides of baseboard, with the turned-over edges working in grooves in the sides of extension frame or on the top edge of same. This admits of the extension frame being made the same size as baseboard.

When it is desired to fold or pack the camera, the front screws are slackened, the fork disengaged from pinion, and the front and fork lowered into recess in the extension frame. The lenses, which remain attached, come through the circular aperture formed in baseboard, or, if desired, the lens panel may be lifted out (before the front is lowered) and placed face upwards in the recess in baseboard, so that when the camera is closed the lenses will project inside the bellows. The lens panel I prefer to make of such a size that it will just fit into the circular opening in baseboard, being prevented from falling through by the projecting flange connected with the turntable.

In order to allow the body of camera to swing or move in a horizontal plane, I hinge or pivot the same to two plates and also the stretchers which support it. These plates have radial slots in them. To the sides of baseboard I attach two angle-plates, which are bent and project over the top edge of extension frame, and so form supports for the flat slotted swing plates. A set-screw passes through the radial slot in each swing plate, and works in the supporting angle-plate beneath, and thus serve to clamp the swing-plates at any angle. Slotted stretchers and set-screws allow the vertical swing in the usual manner.

Instead of using loose or fixed spirit levels for adjusting the swing back and front, I place in a convenient position on the side of camera body and on the side of front board a small swinging or pivoted plate or pointer to indicate when the parts are plumb. I also place a similar plate on the revolving or square reversing adaptor, whichever may be used, so as to hang plumb whichever way up the adaptor is placed, for the purpose of getting the picture horizontal and parallel with the edge of plate.

Instead of making the dark slides to slide or push into a groove as usual, I make them so that they may be placed in position from the back, and when pressed forward into their place in camera they shall engage with one or more springs to lock them in position until released.

The focussing screen is made of a flexible material, which may be stretched on a frame or wound on a roller, as described in the before-mentioned specification. Instead of or as an auxiliary to the spring connected with the roller for winding and giving tension to the screen, one or more lengths of indiarubber may be attached at one end to the said roller and the other end to camera body, so as to wind the screen up by the tension of the indiarubber when the screen is released, and keep it “taut” when extended. One or more pieces of indiarubber may be attached to the screen to counteract the force or jerk when the screen is released.

AN IMPROVED PHOTOGRAPHIC CAMERA.
No. 13,549. WARWICK BROOKES, 350, Oxford-road, Manchester.—
October 23, 1886.

THIS invention relates to an improved combination and arrangement of parts constituting a portable photographic camera for taking instantaneous or other pictures.

The body of the camera is in the form of an oblong box, provided with a rabbit at the back to receive the ground-glass focussing frame and the dark slide. There is a recess at the bottom of the camera to contain the focussing frame when not in use.

The back is hinged at the top, and is provided with two side-pieces, so that when raised it forms a hood so as to dispense with the necessity for a focussing cloth.

The shutter of the dark slide is hinged to the frame, and it is provided with a slot and a band, beneath which (as the slide is placed in the camera) the end of an arm or lever is passed. This arm projects from a rod passing across the body of the camera (inside) and provided with a turn button on the outside, so that when the slide is placed in position, the sensitised plate can be exposed by turning this button so as to cause the arm to open the hinged shutter inside the camera.

An opening is provided in the back through which the shutter can be fastened or unfastened after it is placed in the camera and the back shut.

The lens is fitted to the front of the camera, and the focus is taken by moving the same to or fro by means of a turn button outside, the said button being fixed on a rod, at the other end of which is a pinion taking into the rack of the lens.

In the front of the lens is a frame hinged from above, and carrying the instantaneous shutter, and when longer exposures are required this hinged frame can be opened and closed so as to act as a cap to the lens. The instantaneous shutter is of the revolving type, and is released by a small catch underneath the camera.

The camera is fitted with a "view-finder," which consists of a hinged frame on the top near the front, and a movable arm or strip pivoted to the back and made with an eye-hole.

The hinged frame of the "view-finder" when shut lies in a recess on the top, and incloses and holds down a movable card or paper slip, upon which memoranda of the subjects and exposures can be made, and a small spring is also provided for holding a pencil to be used for that purpose.

The camera may be held in the hand close to the cheek, and by looking through the "view-finder," the subject may be followed, and the instantaneous exposure of the plate made at the proper time by pressing the catch, or if a longer exposure is required, it is provided with a screw for attaching it to a stand.

The claims are—1. The herein-described improved photographic camera, embodying the combination of improvements herein specified. 2. The hinged hood for shading the focussing screen of a photographic camera when the hood is raised, without the use of a cloth, and for enclosing the dark back when the same is inserted into the camera body from the rear, as specified. 3. In a photographic camera, the combination with a dark back having a hinged flap shutter opening into the camera body, of the means substantially as herein described for effecting the opening and closing of the hinged shutter after the dark back is inserted. 4. In a box-body photographic camera the combined hinged flap and instantaneous shutter for long and short exposures respectively, the said flap enclosing the front of the body and the instantaneous shutter being mounted thereon, as specified. 5. A box-body photographic camera, having a lens front or frame capable of being racked forward or backward wholly within the body in combination with a combined hinged flap and instantaneous shutter enclosing such lens front or frame, substantially as specified.

IMPROVEMENTS IN THE CONSTRUCTION OF PHOTOGRAPHIC CAMERAS.
No. 14,262. HENRY PARK, 1, Orchard-buildings, Kingsland-road, Middlesex.—
November 5, 1886.

THE object of my invention is to effect improvements in the construction of folding photographic cameras, whereby they are rendered compact and portable, and improved facilities for manipulation are afforded.

I form the baseboard in two parts, the lower half of the board being made solid, and the upper (sliding) half being a rectangular frame provided with rabbets and racks as usual. The upper part of the baseboard is made to slide forward upon the lower baseboard.

The lower baseboard is fitted on each side with a metallic groove or slot. In each of these slots I fit a slide-bar, which carries the lower centre or pivot of the radial bar or link, and also a vertical bracket and a set screw. The set screw is used to fix the position of the slide-bar in the slot, and the bracket is fitted with a screw which forms one of the pivots for the back board.

The focussing pinion is fitted to the lower baseboard, and the front plate is fitted to the upper baseboard, to which it is fixed in any required position by set screws and nuts.

The bellows body is made parallel, and is attached to the front and back plates in the usual manner.

The main features of novelty in this invention are the outside metallic grooves in the baseboard; the slides which work therein; the brackets attached thereto carrying the working centres of the back board, this back board having double swing motion, which allows the back part of the camera to be put in any position on the baseboard as required when wide-angled lenses are used, readily and without detachment; also the adjusting links; also the means of folding the camera (no hinges being used), and the protection afforded to the focussing plate by the solidity of the lower baseboard when packed.

The camera is fitted with all the usual appliances for manipulating the same.

A HOLDER FOR LENS-DIAPHRAGMS IN CAMERAS.
No. 14,421. JOHN EDWARD THORNTON, 3, New Lorne-street, Moss Side,
Manchester.—November 9, 1886.

THE object of this invention is for the purpose of dispensing with the necessity for having a loose case for the reception of lens-diaphragms or stops, such as is usually carried in the pocket.

In carrying out this invention I form a receptacle which I call the diaphragm-holder, which may be a plate having its edges turned over on three sides to hold the diaphragms in position, leaving the top open so that the diaphragms may be readily withdrawn. A spring, having a projection attached, is made to press against the diaphragms, and the projection, passing through the holes therein, prevents them being withdrawn till the spring and projection are pressed out of the way.

The holder may be made of metal, ebonite, or other suitable material, and may be attached to any part of the camera in a convenient position. In some cases I prefer to place it on the camera front near the lens, but generally I prefer to place it on the side of camera body.

If desired, the holder may be formed in the woodwork, by recessing or cutting it out, or in any other way which may be preferred.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
October 17	Notts	Institute, 9, Shakespeare-street.
" 18	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
" 18	North London	Myddelton Hall, Upper-st., Islington.
" 18	Bolton Club	The Studio, Chancery-lane, Bolton.
" 19	Bristol and W. of Eng. Amateur	Queen's Hotel, Clifton.
" 19	Bury	
" 19	Hyde	Mechanics' Hall, Hyde.
" 19	Manchester Club	
" 19	Edinburgh Photo. Club	5, St. Andrew-square.
" 19	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 20	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION

The usual weekly meeting was held on Thursday, the 29th ultimo,—Mr. A. Mackie in the chair.

Mr. H. N. SMITH exhibited several negatives taken with a pinhole pierced through a piece of tinfoil, and one negative was especially sharp and clear.

Professor STEBBING said some pinhole photographs of Notre Dame recently exhibited before the French Society were exceptionally good. An exposure was given of fifty minutes. How the pinhole was made influenced materially the image. After piercing the hole the burr should be carefully filed off.

Mr. J. B. B. WELLINGTON remarked that a greater part of the failures in pinhole photography were frequently due to the flimsy, makeshift nature of the camera employed.

Mr. A. L. HENDERSON said a client of his had recently sent him a Daguerreotype to clean; upon washing it in distilled water the film all round the edges of the plate blistered and peeled off. For cleaning he used a strong solution of cyanide followed by alcohol and allowed to dry spontaneously. The Daguerreotype was handed round for inspection; it appeared to have become oxidised on those parts where the film had peeled off.

Mr. J. TRAILL TAYLOR, in place of alcohol for drying a Daguerreotype plate, used distilled water and then held the plate over a spirit lamp.

Mr. W. M. ASHMAN thought the peeling of the film might be due to the plate being varnished.

Mr. W. E. DEBENHAM had never seen a plate of this kind varnished.

Mr. TAYLOR said the Daguerreotypes sent out by Mr. Mayall were always varnished; they were, however, not described as such, but stated to be enamelled.

Mr. J. J. BRIGNSHAW drew attention to the curious appearance presented by some lantern plates coated with collodio-bromide emulsion. After drying the film was full of minute holes and cracks. He had dried the plates by heat and also allowed them to dry spontaneously, the result being the same in each case. The emulsion was made from the same formula he had always used excepting that the silver was divided and added at two separate times. Was the failure to be ascribed to this departure?

Mr. DEBENHAM thought it was attributable to water in the film.

Mr. BRIGNSHAW remarked that he took every precaution to prevent this. He first soaked the emulsion after washing in alcohol, afterwards squeezing it through a fine handkerchief, using a lemon squeezer he kept for the purpose.

Mr. DEBENHAM said methylated spirit was answerable for many of the failures in collodio-bromide emulsions. If the emulsion was coated too thickly it would be liable to crack.

Professor STEBBING said coating in a damp room would cause markings of the film from the rapid evaporation of the ether and alcohol and the condensation on the film of the damp atmosphere of the room.

Mr. W. LANG, JUN., placed on the table prospectuses of the International Exhibition of Industry, Science, and Art, to be held at Glasgow in 1888. He gave particulars of the Photographic and Fine Art Sections and invited exhibits of pictures and photographs.

Professor STEBBING announced that a French Universal Exhibition would be held in 1889, and he suggested a committee being formed in England for the purpose of assisting intending exhibitors. In reply to a member, Professor Stebbing said a prize of 40*l.* had been offered for a process that would be an improvement upon the gelatino-bromide process, the process to be given to the world.

Mr. TAYLOR alluded in feeling terms to the death of Mr. J. G. Tunny, of Edinburgh. A resolution recording the sympathy and great grief felt by the members of the Association was passed, and the Hon. Secretary was directed to forward the same to the family of the deceased.

Mr. John Jackson, 13, Soho-square, was elected a member of the Association.

ANOTHER meeting was held on Thursday, the 6th instant,—Mr. J. Traill Taylor in the chair.

Mr. JAMES THOMPSON, of Liverpool, exhibited a whole-plate camera, which he stated combined several improvements, having a long focus and being very compact and light. The focus of the camera shown was twenty-one inches; this, Mr. Thompson said, could be increased if required. The handle for racking the camera was at the back, and when not in use could be doubled up and fitted into a recess of the baseboard. The camera was similar to the old Kinnear form, and in reversing required to be unscrewed from the baseboard each time.

A question from the box was read:—"How is mercury to be removed from a negative that has been intensified with this salt?"

It did not appear quite clear whether the questioner required to be informed as to the entire removal of the mercury from the film after application or whether partial reduction of density when too intense was required. In the latter case it was recommended to place the negative in a hypo bath until the necessary reduction was obtained.

Mr. L. MEDLAND gave some interesting particulars of his recent visit to Denmark and Russia, illustrated by a series of prints taken by him during his tour. The Russian views were obtained under great difficulties, and in one case he was taken before the chief of the police and only liberated after much parleying and considerable delay. Mr. Medland attributed a great deal of this suspicion to his pneumatic shutter, which was regarded as a kind of infernal machine. Altogether he expressed himself as being heartily glad to get out of the country. Photographing after this in Denmark, where he was allowed, without let or hindrance, to take what views he liked, even to the so-called fortifications, Mr. Medland regretted very much not taking a detective camera with him, and he advised intending tourists on the Continent to add a camera of this description to their outfit. The difficulties in Russia he found on inquiring only applied to tourists and not to local photographers.

To the question, was it possible to get perfectly sharp pictures from the deck of a vessel while the screw of the vessel was revolving, several members answered in the affirmative.

The CHAIRMAN said in a case of this kind if the camera was held in the hand it must not rest against any part of the vessel. On one occasion he took a shot from a railway carriage window, resting the camera against the side of the window. The picture was blurred. On the next occasion he held the camera in his hand and succeeded in getting a fairly sharp negative.

An interesting discussion followed, in which the Chairman, Mr. Thompson, and Mr. F. A. Bridge detailed their experiences with foreign officials and the devices resorted to in order to obtain certain views they wanted.

Mr. R. KEENE mentioned that at the visit of the members of the Photographic Convention to Edinburgh in July last he was not allowed to take his camera near a certain fortification.

The CHAIRMAN stated that permission to photograph in any of the London parks was very easily obtained by simply asking for it.

Mr. H. S. TRINKS exhibited some negatives taken with the new projecting microscopic eye-piece of Zeiss, of Jena; the results were very fine. He also exhibited several of the eye-pieces mentioned.

The CHAIRMAN, by request, gave a description of the Welsbach incandescent gaslight, some account of which will be found in a leading article in the present number.

One of the members promised to bring the light and show it at the meeting on the 20th instant.

CAMERA CLUB.

THURSDAY, October 6, was the first technical evening of the winter session at the Camera Club. Mr. Alfred Deed occupied the chair.

A paper, entitled *Where go, what take, and some other matters*, was read by Mr. W. ADCOCK, who, in opening his subject, referred to articles which had appeared in the photographic journals as to where to go with the camera. He held it absurd to go far away in search of work when it was to be found close at hand, and he then dwelt upon the beauties and opportunities, as he saw them, in public resorts in London, such as Regent-street being repaved, and Trafalgar-square on a summer's day. He hoped that some who did not care for rustic scene-hunting would think out subjects of an order that should employ some invention, some predetermined arrangement, and that they would devote themselves to the production of figure pictures, representing, if not dramas, at least minor episodes of real life. He had been charged with having a liking for somewhat vulgar subjects. He hoped in his treatment he had done something to refine them. Incidents of low life, the sorrows and struggles of the poor, had been portrayed by great painters—by some to the entire exclusion of all other subjects; and the vulgarity or refinement of the work was dependent upon its treatment by the artist. He saw no end to what might be done practically, whether by quick shots at groups, or by arrangement with individuals for posing, to carry out subjects determined on. He insisted on more interior work being done, and advantage taken of the fine interiors available in London. He then referred to landscape work, and apprehended that many photographers in the future would give the same thought and care to a subject as a Graham or a Vicat Cole. Very few exposures would be made, but the parts of the picture would be carefully studied and composed, and a far larger size than at present would be worked. He had a belief in a direct picture as distinct from an enlargement. One point he wished to emphasise, the desirability of using a plate less square, particularly for figure work. Plate makers should keep in stock sizes in which the breadth was to length as one to one and a half. In conclusion, the lecturer drew attention to the use of plain salted papers, and described his method of sensitising them. He also showed pictures upon grocers' tea paper, treated in this way, and rough prints upon blue paper.

The CHAIRMAN, in opening the discussion, spoke of the difficulties of working with anything but a detective camera in the streets of London. He had had some experience of the persistency and curiosity of a London crowd, and would not advise the planting of a camera in Regent-street. One point he hoped would receive full discussion, that of the respective advantages of large direct work and enlarging from small negatives.

Mr. D. P. RODGENS was all in favour of small cameras and enlarging, except for large heads. Apart from the convenience of light weight and ease of

manipulation in the field, small lenses were better in working than large ones. He found he could use $\frac{1}{7}$ instantaneously with his small lenses in the country and secure good exposure, where the large lens gave but a very faint impression on the plate. He thought he could show some enlargements from quarter-plate to whole-plate and 12x10, which could not be distinguished from direct work.

Mr. DAVISON highly appreciated Mr. Adcock's address, but felt that he had been taking Londoners to task for overlooking work to their hand without very fully seeing the difficulties of such work for men with daily avocations in town. Then again, the detective camera was not very likely to help one to works of art, though it might lead to very interesting bits being secured. He agreed with Mr. Adcock that there need be nothing vulgar in the treatment of low-life subjects, and also in his remark "how little it takes besides the treatment to make a picture;" but he thought Mr. Adcock ought to have added "how difficult, how impossible, it is to command this treatment." It was easy enough to recognise sentiment, pathos, or humour, in a subject, and also to fix it so as to secure interested attention from people of a sympathetic turn; but to treat the material so as to produce a work of art was a different matter, and not more than one or two photographers had anyway approached success in it. In regard to interiors Mr. Adcock had said "no other than a wide-angle lens was suited to interiors of much depth." He should have said that it was particularly in interiors having little depth that the wide angle was most essential. He did not think that enlarging would displace large direct photographs in artistic work. A picture generally had a scheme, and was worked out in minutest details, and enlarging would probably be felt to disturb the elements or alter the feeling conveyed by the work.

Mr. BLANCKENSEE had tried some of the very work suggested by Mr. Adcock in Regent-street, but all his plates had proved under exposed.

Mr. SAGE did not like enlargements, nor could he advise outdoor work with a huge camera, unless the operator enjoyed such chaff as an advice to "get inside and pull down the blind," &c., to which he himself had been subjected.

Mr. LYONEL CLARK was in favour of enlarging. He did not like sharpness in any one part of the picture or plate, but preferred a certain amount of fuzziness all over the picture. For instance, he would draw attention to one of Mr. Byrnc's large direct heads now in the exhibition at Pall Mall (a portrait of an old gentleman), where the near part of the figure was sharp and detailed, and every hair clear as the lines on a small-scale map, and the off side was a snowy blotch. He thought he would have done better to have taken the portrait small, and to have enlarged it. The small lenses were much easier to construct, and gave greater depth of focus, if he might use that expression, which was really a misnomer, and meant a want of definition in any one plane. He then instituted a comparison showing that the enlargement from work done by a small lens would be expected to be sharper on the whole than that same large size done direct. He should suggest enlarging by daylight, and with the same lens as the small negative was taken with. He thought the best plan was to make an enlarged positive, say to 12x10, and then to copy again down to 10x8, that being the size required. It was impossible to get glass plates close enough together to make the transparency and final negative by contact. It would often be found that the best enlargements would be obtained from the poorest negatives, at least from the over exposed ones.

The CHAIRMAN said that a serious objection that might be taken to enlarging was that it meant a great deal of work.

Mr. RODGERS found that his enlarging was done very expeditiously with a lantern with large condenser, which he kept ready at all times for working with the oxy-hydrogen light. One point of interest he would like to raise (it was one he was at present uncertain about), whether a better result were obtained by direct enlargement upon paper from a negative, or by making an enlarged negative.

Mr. ADCOCK then went over the remarks that had been made, and met certain objections raised by the speakers. One point he was glad to find such general agreement upon, and that was the need for an alteration in the proportions of dry plates, and for the more general keeping in stock of the oblong forms of plates.

A cordial vote of thanks was passed to the lecturer.

On Thursday, October 20, at eight o'clock, lantern slides will be exhibited. Mr. Brooks will show an interesting series of interiors of Windsor Castle. Members will also be expected to bring slides for exhibition.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held on Tuesday, October 4, at Myddelton Hall, Islington, N., Mr. J. Traill Taylor, President, in the chair, Mr. L. MEDLAND asked the cause of some curious transparent spots which had appeared on some of his plates after fixing.

Mr. J. JACKSON suggested that the defect might have been the result of using the fixing bath too strong.

Mr. F. DUNSTERVILLE, of Madras, had experienced the same defect.

The PRESIDENT thought that if a strong fixing bath had been used the defect might be caused in the washing, by the change from a dense liquid to a rarer one, in the same way that blisters are produced on albumenised paper prints.

Mr. F. G. READER inquired if any one had had any experience of the use of zinc hypo-chlorite for eliminating hypo.

Mr. JACKSON had used chloride of zinc, but he found that it made the prints a bad colour.

The Hon. Secretary showed some negatives taken by means of "The Ready Photographer," which was exhibited at the last meeting of the Society. They were considered very good specimens of pinhole photography.

In a short discussion on stripping films and paper negatives, The PRESIDENT said that a paper negative squeezed on to ebonite had been sent him by Captain Murray, who wished to know how to strip it from the ebonite; it was found impossible to do this by the ordinary means. Captain Murray had, however, since written to the effect that he had been successful in treating similar refractory cases. He found that warming the ebonite would enable the negatives to be stripped easily. The President had tried the means suggested with complete success.

Mr. MEDLAND gave a most interesting and amusing account of his trip to and photographic adventures in Norway, Sweden, and Russia. He recommended any one desirous of a pleasant holiday to go to Stockholm, where plenty of work for the camera might be found, and there was not the slightest restriction to its use anywhere about the city. He would also recommend that Russia be avoided, as Russian officialism did not appear to take kindly to photography. His experience in St. Petersburg and Moscow showed that it was very difficult to appear in public with a tripod without incurring the risk of an involuntary trip to Siberia. On attempting to photograph some of the public buildings he was escorted to the police office, and, after interviewing various officials, was brought before Prince Dolgorenki, Chief of Police, who informed him that permission should have been applied for, and then, after an inquiry had been made as to the political status of the applicant, the matter would have received consideration.

Mr. W. B. PEARCE suggested that, to meet a difficulty Mr. Medland and, doubtless, others had experienced in purchasing chemicals in foreign countries, a list of the names of the chemicals, apparatus, &c., most likely to be wanted on a tour should be published, with a translation into various European languages.

The PRESIDENT said that such a glossary was already prepared for one of the annuals.

The next meeting will take place on Tuesday, October 18, when the officers for the ensuing year must be nominated. It will be a lantern night. Visitors are invited.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

The first meeting of the present session of the above Society was held at the Greyhound Hotel, Dulwich, on Wednesday evening, October 5.—Mr. W. H. Walker in the chair. There was a full attendance.

It was announced that arrangements had been made for a demonstration of carbon printing.

In spite of the fact that there was no formal communication to the Society, there was an interesting and instructive discussion on the use and advantages of the Eastman stripping films, which had been extensively used by the members during the recess.

The next meeting will be held on Wednesday, October 19, Mr. Yates in the chair.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

The annual meeting was held on Tuesday, October 4, in the Masonic Hall, Surrey-street.

After an excellent dinner provided by the Steward, Mr. Turner, the chair was taken by Mr. W. B. Hatfield, in the absence of the President, Mr. T. S. Yeomans. There was a very good attendance of members, and, after routine business, the election of officers was proceeded with:—*President*: Councillor T. Firth.—*Vice-Presidents*: Messrs. T. S. Yeomans (retiring President) and A. S. Platts.—*Treasurer*: Mr. Charles Yeomans.—*Hon. Secretary*: Mr. J. W. Charlesworth, 227, Cemetery-road.—*Assistant Secretary*: Mr. E. Beck, Nerfolk-row.

A vote of thanks to the retiring officers was passed, and a special vote of thanks was given Mr. Joseph Taylor, the retiring Hon. Secretary, for services rendered during a course of many years.

After the balloting for Council it was found that the following five were elected:—Messrs. W. H. Bacon, Joseph Taylor, Jonathan Taylor, W. B. Hatfield, and T. G. Hibbert.

Mr. W. J. Spink was elected a member.

The statement of accounts showed a considerable balance in favour of the Society.

In the yearly competition for the Society's medals for the best six pictures taken during the year, Mr. T. G. Hibbert was the fortunate member who carried off the silver medal, and deservedly so, his series being remarkable for artistic study and technical excellence. The bronze medal was awarded to Mr. Jonathan Taylor for a frame of well-selected views; the effect, however, was impaired by having one cloud in all six pictures. Dr. Merton's and Mr. B. J. Taylor's pictures showed very careful study, and ran very close for second.

NORTH STAFFORDSHIRE AMATEUR PHOTOGRAPHIC ASSOCIATION.

The inaugural meeting of the winter session was held on Wednesday, October 5, under the presidency of Mr. C. Alfieri.

A pleasant hour was spent in the ventilation of various subjects interesting to amateur photographers and in the examination of views of Moreton Old Hall, Cheshire, one of the finest specimens of the old half-timbered houses of the Elizabethan period now existing in the country.

A discussion subsequently took place upon the superior attractions of large pictures over those of small dimensions, the Vice-President giving preference to the former, while the President maintained that pictures of moderate dimensions, being more readily taken in by the eye in their entirety, were, *ceteris paribus*, more gratifying to the observer.

Referring to a well-known brand of dry plates, Mr. LEEK said he had always failed to get sufficient density with them, notwithstanding the liberal use of pyro.

Mr. DRUMMOND stated that he had had a rather singular experience while developing an interior of a church taken on one of these plates, namely, that a text round the altar screen had appeared quite plainly on the negative in the early stages of development, but had disappeared altogether when the plate had been fully developed.

After some suggestions for an exhibition of members' work to be held in the near future, it was resolved that, by way of inaugurating the winter session of the Association, an exhibition of lantern slides be held at the Mechanics' Institution, Hanley, on Wednesday, the 19th instant.

The PRESIDENT having feelingly called the attention of the meeting to the fact that Mr. T. H. Hall, one of the earliest members of the Association, had

been removed by death from their midst, it was proposed that "The President, Vice-President, and Council of the North Staffordshire Amateur Photographic Association desire to convey to Mrs. Hall the assurance of their deep sympathy with her and her family in their recent bereavement, and to place on record their sense of the abilities and estimable qualities of the late Mr. T. H. Hall."

Messrs. Beech and Wright were elected members of the Association.

Correspondence.

Correspondents should never write on both sides of the paper.

THE PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—In the leader on the Photographic Exhibition in to-day's BRITISH JOURNAL OF PHOTOGRAPHY, it is stated that no examples of the application of orthochromatic plates to landscape work are to be found in the Exhibition. Allow me to draw your attention to the fact that I exhibit two landscapes taken under the same conditions of lighting on ordinary plates and on plates bathed in a solution of erythrosine, a yellow screen being used in the latter case (278 and 279, 294 and 295). The prints are not large, and are hung low, and hence they have escaped your attention. The results show greater differences than might have been expected, the improvement in the rendering of distance and foliage being especially noticeable. I may add that during the past year I have made a number of experiments in this direction.—I am, yours, &c.,

The Yorkshire College, Leeds, October 7, 1887. C. H. BOTHAMLEY.

To the EDITORS.

GENTLEMEN,—Owing, I suppose, to some inadvertence on the part of the Assistant Secretary to whom I sent full particulars, my exhibit at the Photographic Society of Great Britain is erroneously described as lantern slide. Although they are capable of being utilised as lantern slides, that is not their intention; they are specially intended for window decoration, and for that reason they are mounted with a clear instead of an opaque margin.

They consist of the picture, by the Woodbury process, hermetically sealed between two glasses, the medium employed being of such a nature that it produces a ground-glass effect without obstructing the light in any material degree, and, moreover, renders the pictures bright on both sides, thus obviating the very disagreeable effect of a ground-glass backing.

I have not myself tried them as lantern slides to my satisfaction, as they require a condenser of rather larger size than usual, four and a half inches, but am inclined to think that then they would be extremely effective as lantern pictures.—I am, yours, &c.,

GEORGE SMITH.

26, Colebrooke-row, N., October 11, 1887.

PLATES FOR HOT CLIMATES.

To the EDITORS.

GENTLEMEN,—Perhaps the following remarks on the behaviour of dry plates in Calcutta may be of use to some of your readers.

During our cold season—or, say, from the middle of November to the middle of March—I have obtained very satisfactory results from all the well-known makes of plates which I have tried; but it is when our hot and rainy seasons are on us that working dry plates becomes a real difficulty. Slow plates I soon found to be practically useless during the two latter seasons, as when they did not turn into "dissolving views" in the developer they invariably did so in the after-washing process, even when ice was used. If perchance they escaped in the washing, the drying process resulted in the complete dissolution of the film.

The extra rapid and instantaneous plates were far better, as the films had much less tendency to melt than those of the slow plates, and good results might often be obtained with care, patience, ice, and alum. There was still, however, a great inclination to frilling, particularly in the final washing and drying processes.

For the last few years I have, however, been using *Tropical* or *Insoluble* plates, and these are, without exception, the finest plates I have ever used. Frilling or melting films never occur with them, and they stand an immense amount of rough handling and development. They are very easy to control, and yield negatives of any required density. No ice is required for them, and the alum bath is only necessary when the plate requires clearing. I have left these plates soaking in the same water for three days in the months of May, June, July, August, and September—not once, but frequently. I have then taken them out, wiped the water off the film with the back of my hand, then dried them both in the sun and over a kerosine lamp, and had them in the printing frame in perhaps a quarter of an hour after taking them out of the water. I use the simple pyro and ammonia developer, which I prefer to all the others I have ever tried.—I am, yours, &c.,

JNO. J. MEADE.

4, Hastings-street, Calcutta, September 19, 1887.

[The plates alluded to by our correspondent are an American production, and it is understood that their insolubility in warm water arises from the presence of chrome alum in the emulsion.—Eds.]

ROYAL CORNWALL POLYTECHNIC SOCIETY'S EXHIBITION REPORT.

To the Editors.

GENTLEMEN,—In your last issue I have just read the letter of your correspondent, Mr. H. P. Robinson, relating to the Judges' Report of the Photographic Section of the above Society.

The report, in its altered form, as published in a contemporary journal, I consider materially prejudicial to several of the exhibitors, and is entirely different to the correct report as published in THE BRITISH JOURNAL OF PHOTOGRAPHY on September 16.

Your correspondent's letter suggests that I should have stated to what extent and in what matter the said report had been altered. With your permission I will do so in parallel columns, without further comment, leaving your readers to form their own judgment thereon:—

Extracts of the report as published on September 16 in THE BRITISH JOURNAL OF PHOTOGRAPHY, which is a correct copy of the official report of the Judges:—

"PROFESSIONAL SECTION."

"No. 609 is an instantaneous picture of a large number of sea gulls on the wing, and this has been awarded a second silver medal. The birds are in every conceivable position, and most of them perfectly sharp, showing that the exposure must have been very rapid, and such a picture must prove of great value to the painter. This picture is by Mr. B. Wyles, of Southport. The same exhibitor has several other meritorious productions."

"No. 617, *Carolling*, by Mr. H. P. Robinson, is a most artistic production, and must rank among that gentleman's works as one of the finest; it is full of poetry, and is printed in sepia, and too much cannot be said in its praise. As usual, he takes the highest award—the Society's first silver medal."

"Mr. J. B. Scott sends several artistic productions."

"Mr. J. Weir has several fairly good pictures."

"Mr. W. J. Byrne, of Richmond, sends some very high-class work. A first silver medal has been awarded to a direct picture of large size of the Hon. Frederick Tollemache. It is a most splendid specimen of untouched photography, the finest in the Exhibition. The frame above it, by the same artist, contains some specimens of photography (portrait studies) taken in ordinary rooms, &c., being perfect gems in their way, and cannot fail to attract attention."

"A second silver medal has been awarded to a picture of the Countess of Londonderry, by Mr. J. Lafayette, of Dublin. It is a perfect picture, and the retoucher's art has played a prominent part. There are several other magnificent works of the same order."

"Messrs. West & Son again send some of their yacht pictures, which are wonderful productions, but the Judges do not think they quite come up to their former exhibits."

Extracts of the report as published on September 16 in a contemporary journal, which is NOT a correct copy of the official report of the Judges:—

"Professional Section.—B. Wyles (of Southport) has several other meritorious productions."

"617, 'Carolling,' by H. P. Robinson, must rank amongst that gentleman's works as one of the most characteristic; it is printed in a sepia tint."

"West and Son again send some of their yacht pictures."

I am, yours, &c., WM. BROOKS.

discussion on the paper, gave a general denial that such a percentage of error could exist. I then endeavoured—though without success—to convince him, and mentioned incidentally that in using the six and eighteen-inch lenses in combination, the error would amount to about one hundred per cent.

Your correspondent, Mr. Simon, has, however, been more fortunate, and has succeeded in obtaining from Mr. Smith an admission of the correctness of calculations which reveal an error in the area system of over one hundred per cent., though, remarks Mr. Smith, one of the lenses would actually require nine times the exposure of the other; as if that were an extenuation of the fact.

Mr. Smith, it appears, is not aware that sets of combination lenses are made and sold in which two lenses having very different focal lengths work quite as well as two having nearly the same focus. This, however, is the case; although, so far as the area system is concerned, it is of little consequence, for Mr. Smith predicts that if the system should become popular such doublets will not be employed—that is to say, photographers will find the area system so simple, and so far surpassing in merit any other method of numbering stops, that they will use only those lenses to which the system can be properly applied.

But, let me ask, Did we need another system of numbering stops? We had the uniform system, and this is an area system. Does Mr. Smith's plan possess any tangible advantage over the uniform system? True, the latter is the system recommended by the Photographic Society of Great Britain, and that we have, in using it, to deal with only one number—the stop number—instead of with two—a stop number and a lens number—as in the area system; but I fancy that these will, generally, be considered as advantages.

Mr. Smith claims it as an advantage peculiar to the area system that the stop numbers are based upon the unit one-sixty-fourth of an inch. The real unit is, however, $(\frac{1}{64})^2 \times 10 = \frac{10}{4096}$, or roughly $\frac{1}{409}$ of a square inch. But the uniform system numbers are based upon the exact diameters of the stops, and, to most of us, it will be self-evident that the area system cannot be more accurate than that which is quite accurate. It must be further noticed that it is the fact of taking so small a unit that makes the area numbers so large.

In conclusion, it is certain that the area system is such that it cannot become popular, and that the time will never arrive when the cry shall be, "The system! the system!" instead of, as now, "The lens! the lens!"—I am, yours, &c., O. SMITH.

P.S.—I notice that I have omitted to refer to Mr. Simon's difficulty of having to carry into the field a separate set of stops for each of his lenses, but I cannot venture to trespass further on your space. If, however, you will put him into communication with me, I think I may be able to assist him.

To the Editors.

GENTLEMEN,—I have to thank Mr. George Smith for his prompt reply to my letter, but, at the same time, I must confess that I feel some disappointment at his inability to meet my difficulty.

Mr. Smith now explains at length that his system was intended to apply to a set of lenses which he considered suitable for his own work, but I can nowhere find in his previous writings on the subject that he makes any mention that his system is applicable only to some lenses, and not to all. So far, therefore, according to his own admission of the facts, Mr. Smith has attempted to lead the photographic public into adopting a system which is accurate only under certain conditions as to the construction of the lens, and which, when these conditions are not complied with, allows of the possibility of an error occurring, amounting, as I have shown, to considerably over a hundred per cent.

Mr. Smith characterises my letter as a "hoax," because it happens that my lens will not fit his system. If the word is permissible at all, surely it might be more appropriately applied to the system which will not fit my lens.—I am, yours, &c., S. SIMON.

TEN PER CENT. SOLUTIONS.

To the Editors.

GENTLEMEN,—In your last issue this subject is treated at length by Mr. Lionel Clark, with the effect of confusing what is a tolerably simple conception. The expression ten per cent. is certainly technical, but its meaning should be as well known as that of the also technical expression "a cup of coffee." The meaning usually attached to the phrase is that in ten minims of the solution there will be found one grain of the salt, if solid, or one minim if fluid, as ammonia.

Mr. Clark says, "One ounce of pyro dissolved in ten ounces of water is without doubt a ten per cent. solution by weight only." This statement is decidedly incorrect; the proportion is one ounce by weight of pyro in ten by weight of water, giving one in eleven of the solution, and therefore ten in one hundred and ten, instead of a hundred.

Take any table of specific gravities where the percentage is given, probably at intervals of five per cent. up to saturation; what does ten per cent. there mean? It means ten of the salt to ninety of water, all by weight, the total weight being 100, not the weight of the water employed. It is also overlooked that when a given bulk of water and salt are brought together a shrinkage occurs which is probably different for each kind of

THE AREA SYSTEM OF GEORGE SMITH.

To the Editors.

GENTLEMEN,—It is to be regretted that Mr. George Smith has not taken the photographic public entirely into his confidence with regard to his system of numbering stops and lenses. If Mr. Smith was aware that the method he had given for finding the area number of a doublet lens was entirely an empirical one, and only gave correct results when the two lenses were of similar focus and when the separation was not taken into account, it would certainly appear that this fact should, at the outset, have received some notice from him, and that he should not have led his readers to infer that his system was universally applicable.

In a paper recently read by me at the North London Photographic Society, I pointed out the difficulties that would occur in applying the area system to a Darlot's universal series of lenses. I took as an example the five-inch and nine-inch combination used together. In this case the error amounted to twenty-five per cent. Mr. Smith in the

* These exhibitors have been entirely left out.

salt (or other soluble substance); the result of this oversight is that one-tenth grain of pyro and ten minims of water are wrongly made out to measure ten minims only, and in like manner one ounce of pyro and nine fluid ounces one fluid drachm of water are considered to occupy only the original bulk of the water. What should be done is to make up to nine ounces one drachm of solution, and then ten minims will contain a grain of pyro.

In making up sulpho-pyrogallol, it is easy to err, by dissolving the sulphite in perhaps six ounces of water, neutralising and emptying into an ounce bottle of pyro, and thereupon finding that we have some twelve ounces of solution instead of nine ounces one drachm (=4380 minims). In the case of ammonia, take one fluid ounce and make up to ten, and we have what is required. This is not exactly one ounce to nine of water, as there is shrinkage to allow for, but this is quite near enough for all practical purposes.

I, for one, fail to see the utter confusion charged so liberally to our weights and measures. If I read of an ounce of pyro I am never in doubt as to whether a fluid ounce, troy, avoirdupois, or a wild animal is intended, nor do I think that people in the habit of using weights and measures fall often into error on this score.

Mr. Clark develops the French unit of long measure from the kilo through the litre; this should be reversed. The metre is an extremely accurate something or other, nobody seems to know what, as Captain Abney observed the other day at the British Association, and from it is derived the litre, and thence the gramme. The story is old, how in the rage for having everything new France adopted new weights and measures, recommenced the calendar with the year 1, rechristened the months, and made havoc generally. How their unit of measure was found to be wrong after coming into use, but no one proposes to re-rectify it.

Apart from the units employed, which are good enough when thoroughly understood (as are also the English units), the French system has the disadvantage of being decimal, of casting aside as useless the clearness obtained by the use of large multiple-units, and the aliquot sub-units, which have developed with the increasing affairs of mercantile nations. To quote prices per score, per dozen, by the quarter, though convenient, are to be discontinued as unscientific, and to ensure accuracy in our weightings and measurings we must go to the sea-level in winter time and work in a vacuum!

If other nations have followed the example of France in this matter, that is no reason why we should confuse our own population by doing the like; the fact of the adoption of the decimal system in something like the reverse order of commercial greatness of the nations tells against the system. I could urge much more on this subject, but fear to occupy your space to an undue extent.—I am, yours, &c., R. C. PHILLIPS.

4, Camp-street, Lower Broughton, Manchester, October 8, 1887.

LATENT LIGHT.

To the Editors.

GENTLEMEN,—If Mr. Winstanley will kindly refer to A Dictionary of Photography, edited by Thomas Sutton and G. Dawson in 1867, he will find at page 169 a notice on Latent Light which treats on the theory he introduces in your last issue as part of his experiments and investigations in 1875.—I am, yours, &c., H. D. ATKINSON.

62 and 64, Ludgate-hill, London, E.C., October 11, 1887.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPHS REGISTERED.—

Debenham & Gould, Bournemouth.—Photograph of Lord Wolcott and party of speakers at Liberal meeting at Temple Coombe, on October 1, 1887.

J. S. Brown, Bridgewater.—Five photographs of town of Bridgewater and surrounding country.

W. Emmett, Stalybridge.—Photograph of R. H. Brown, M.A., Hon. Canon of Chester Cathedral.

H. COX.—We regret we cannot furnish the address required.

W. L. E.—An article on the subject of hydrokinone is in type for the forthcoming ALMANAC.

J. COLMAN.—Messrs. Houghton & Son, High Holborn, will supply you with non-actinic globes or chimneys for gas burners.

QUANDARY.—More data, than that the prints were mounted with starch, must be supplied to enable us to account for the fading.

G. A. W.—The spots are caused by insoluble particles in the tissue. Without knowing further particulars we cannot indicate the cause.

FRANCIS G. BRETT.—Any of the firms who make a speciality of producing enlargements will make yours on canvas. (See advertising columns.)

A. B. (Dulverton).—1. Mount the print with glue.—2. Cloud negatives on waxed paper when damaged may be restored by the application of heat.

F. WRIGHT.—We cannot undertake a qualitative analysis of the lettering on the mount you enclose. Send it to an analytic chemist with a fee of five guineas.

THOS. MCCANN.—In making the pyroxyllue for collodion, reduce the quantity of water to two drachms. Your failure arose from the large quantity of water you employed.

J. S. S.—Flint glass is desirable. Radius cannot be given unless the whole conditions were known. Place the flat side next the sensitive plate. Send specimen of block work.

F. A. C.—The proportions of the two alkalies is of very little importance, or whether one is used to the entire exclusion of the other, so long as there is sufficient to produce the effect desired.

W. ROBBINS wishes to know how to make a varnish for negatives which will dry quickly and does not require the negative to be heated.—Such a varnish is made by simply dissolving dammar resin in benzole.

A NOVICE.—Until you are more conversant than you say you are with the exposure and development of the negative we should not advise you to attempt to make your own plates. You would probably find it false economy.

T. C. (Withington).—None of the elements composing a non-distorting wide-angle whole-plate lens can be utilised singly for producing a "wide-angle landscape lens" for plates that size. When thus employed a very narrow angle only would be included.

A. H. HALL.—The only objection to the use of citric acid, in conjunction with the pyro and sulphite developer, arises from the fact that the citrates are powerful retarders of development, and therefore it is preferable to employ some other acid in neutralising.

R. J. C. says he knows where he can purchase a twenty-cell Bunsen battery, quart size, cheap, and asks if that will produce an arc light strong enough to take portraits with at night.—A twenty-cell battery will certainly yield a small arc light, but not one strong enough to be of service in portraiture. Forty to fifty cells are necessary to give an efficient light for the purpose.

SLIDE asks whether lantern slides by the albumen process are best made by contact printing or by making them in the copying camera.—They may be produced by either method, but the plan usually adopted is to print them by superposition. If they are made in the camera the exposure is inconveniently long, and, as a rule, the colour obtained is not so good as when they are printed by contact.

C. WALLIS writes as follows: "I have a lump of silver which I have recovered from my residues by fusing them in a small clay furnace with the usual fluxes, and I want to know how much gold it contains, and its value, as I mixed the gold residues with the silver ones before fusing. How shall I proceed?"—Unless our correspondent is capable of making the assay himself (which we presume he is not by his putting the query), the best plan is to cut off a small piece of the metal—say, two or three pennyweights—and send it to an assayer, with instructions to make a "parting assay." This will give the proportions of the different metals. The charge will be but trifling—about one shilling and sixpence, we think.

L. D. writes: "I am anxious to construct a machine for coating gelatine plates, hitherto having done it by hand. Which kind would you recommend? I do not want to use steam power or a gas engine, as the quantity I need are only for home use. I have tried Starnes's plan but do not like it. Also, what kind of metal for making the trough and roller would you recommend as the least likely to injure the emulsion? Any help on the above I should be grateful for through your 'Answers to Correspondents' column."—There are several different forms of plate coating machines by different inventors. There are those of Swan, Edwards, Dodds, Cadett, Palmer, Burton, and others. The best plan will be to get the specifications of the patents and select the one that will best answer your requirements. Of course you will have to obtain a license from the patentee before constructing one for yourself. Usually the machines are driven by gas engines. Copper electroplated thickly with silver is the best for these portions of the machine which is in contact with the emulsion.

PHOTOGRAPHIC CLUB.—At the next meeting, on October 19, the subject for discussion will be On the After-Treatment of Negatives.

We have lately inspected what we may correctly term a huge work of art by Mr. G. W. Austen, of Queen's-road, Finsbury Park. It is a painting representing the annual banquet of the London Prudential Assurance Company, and includes the directors, various officials, and superintendents, numbering five hundred and fifty figures, all reproduced from single photographs specially taken with a view to the pose each is to assume in the group. This large picture is specially prepared, and has been reproduced by the carbon process, the size of the negative being 48x26. It is very successful throughout.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1433. VOL. XXXIV.—OCTOBER 21, 1887.

PHOTOGRAVURE *VERSUS* LINE ENGRAVING.

FOLLOWING up what we said last week about engraving, we observe that in the columns of the *Standard* one day lately a correspondent, Mr. F. Wedmore, in a long letter draws attention to, and laments, the decadence of line engraving. This he appears inclined to attribute not so much to the introduction of photography and photo-mechanical processes, as many suppose, as to the lack, at the present time, of skilled line engravers of the old school. However, Mr. Wedmore takes the opportunity to indulge in some adverse criticism on photography and photogravure.

In appealing to the purchasing public to avert the decay of engraving, he says: "The public must appraise photography, photogravure, and all their allied processes, at their true worth; must distinguish between the money value of the mechanism and the money value of the art; must think the shilling appropriately given here and the guinea there; must perceive that the mechanism, however seductive, has its limitations—is useful for this and ineffectual for that. The mechanism, when all is said, and its last service rendered and acknowledged, no more, to the understanding mind, takes the place of the art than, to the understanding ear, the advance of the barrel organ makes the Richter orchestra superfluous," &c. Again, he says, by its more interested supporters "we are told sometimes that the painter whose work it is proposed to translate prefers the method to engraving. That only shows that one may be an expert in one art and have no sympathy with another." This is somewhat rough upon those artists who appreciate the new art. Further on our critic says: "We are told, again, that the method is not mechanical after all. Our workmen are artists, in a sense. 'In a sense,' is the saving clause, and the sense is, that they are particularly neat workmen." The writer patronisingly remarks, however, that, "of course, no real student need be an enemy to photogravure. With all its developments, under all its newly-devised names, it has a place and a service. How marvellously has it reproduced certain work which was 'black and white' from the beginning!" &c.

Now no one can deplore the decline of line engraving more than we do; but if, as the writer just quoted asserts, there are no new engravers to take the place of the old ones, it is clear that there must be a good reason for it. Perhaps, one may be that few young men nowadays will enter any profession which takes many years of toil and study to acquire proficiency in, without a prospect of its ultimately proving remunerative. In face of the advances made in photographic engraving processes during the past few years, many, who might otherwise have been engravers, have had grave doubts on this point, so far at least as relates to line engraving.

One thing is certain, namely, that a photogravure picture cannot be looked upon in the same light as a line engraving any more than can a mezzotint or an aquatint; not because the one is in any way inferior to the other as a work of art, but because each is a different style of work, and is produced by a different method. In character, a photogravure assimilates more closely to a mezzotint or an aquatint—according to the process by which it is produced—than it does to line work. But it may really be classed as a style of its own; and it has taken such root with the general public that, however much it may be decried by some, it can now, and will continue to, hold its own as a separate and distinct style provided, of course, its high standard of excellence be maintained.

The fact that so many artists prefer to have their works reproduced by its agency is a sufficient proof of its excellence. Every painter, when a picture of his is engraved, is most jealous not only that the drawing and original touch are preserved, but that the colours and tints are correctly translated into monochrome. Until quite recently the translation of the colours of a painting in their true relation in a photogravure was largely dependent upon hand work, and here skilled engravers were necessary. Thanks to the advance made of late in orthochromatic photography, the hand work, in this direction, is now greatly minimised. However, we opine that engravers, and skilled ones, too, will still be required in the highest grades of photographic engraving, for notwithstanding the truthfulness with which the colours may be translated in the negative, there will still be some hand work required.

There is still another reason why photogravure is so popular. A large line plate will sometimes require several years to engrave, and of course it becomes a very costly affair, and in the end often proves, for this reason, unremunerative. It also frequently happens that by the time the prints are issued a considerable portion of the interest in the picture has abated. But a high-class photogravure plate may be produced in a very brief period, and the prints from it issued in a tithe of the time that would be required for a line plate—an immense advantage, commercially, with pictures of passing interest. Again, photogravure enables the public to obtain high-class engravings from works of art, and at a moderate price, which with the old style of work would frequently be impossible, because artists and publishers would not risk incurring the enormous expense of engraving from the fear that the publication would not prove sufficiently remunerative.

Although, as we have said before, the decadence of line engraving is much to be deplored, we must strongly protest against the invectives which are, at times, hurled at a new art, when it is capable of yielding such results as the two photo-

gravures—by distinctly different processes—for which medals have been awarded in the present Photographic Exhibition. These, it must be borne in mind, are not exceptional examples, for equally as good are to be seen in the shop windows and galleries of most printsellers and publishers.

THE WATER SUPPLY.

THE economics of water supply is to photographers a subject of vital interest, one on which centres the whole routine of work, be it in the extensive *ateliers* of the popular professional or on the more modest scale of the occasional amateur. It has, nevertheless, many aspects which are little regarded until the occurrence of some disaster or mishap, by drawing attention to it, causes a remedy to be provided for the faulty arrangement. A case which recently came under our notice is well worthy of description, as comprising several possibilities that might occur in everyday practice, and the recountal of which may serve to warn others. A professional photographer had a batch of between thirty and forty negatives placed to wash after fixing, and upon ranging them afterwards in the rack to dry, it was discovered that nearly every one was completely spoiled, the appearance being presented of the films having been dissolved away. Examination made, and inquiries instituted, soon enabled the true cause of the disaster to be brought to light. In the first place, the sink pipe of the dark room had become stopped up on account of the films of coloured collodion, washed off a number of backed plates, having accumulated so as to form a complete plug. Now it is evident that it is scarcely possible to imagine a more efficient mode of closing an efflux pipe than by allowing films of collodion to be washed into the sink, and then permitted to accumulate at any awkward bend or contraction. Yet, when collodion is used for backing purposes, it is a very probable thing that the precaution of removing it from the sink as it was washed off the plates is one that would not be taken by one out of twenty persons who had previously had no knowledge of the danger. The possibility of an overflow of water is one not to be lightly regarded, for, apart from the damage done to the photographer's own property, he often has to reckon with occupiers of rooms below him.

In the case we are narrating the collodion-wrought stoppage did occur, and until a plumber could be provided the exit pipe at that portion of the premises could not be utilised, the consequence being the removal of the washing tank to another portion of the premises, where were other water tanks and connected taps for carbon printing. The immediate cause of the disaster was as follows:—Through some repairs being required to be made by the water company, the water supply was temporarily suspended, and a system of tanks (erected specially to provide against such a contingency) being in use, the stoppage was not noticed. Presently the tank ran completely dry, and the contents of an adjacent hot-water tank, fed from the cold, backed into the cold-water receptacle, and, of course, ran out of the open tap upon the doomed negatives. It is easy, after the event, to see that such a disaster was sure to happen; yet the tanks had been in use for years without anything of the sort occurring, or its probability having entered the mind of the owner.

Connected with the same subject of overflows are the syphon washing tanks, which are now constructed with such a wide exit aperture that they empty themselves in a few seconds of

time. Disaster may possibly be warded off if this timely word of caution draw attention to the need of looking closely to ascertain if the arrangements suffice to carry off a quick and heavy flush of water.

There are great differences in the quality of the water available for photographic purposes throughout the country, both as to its purity and its freedom from suspended matter. The former is a far more important consideration nowadays than it was in the time of collodion negatives, as then no one printed from a negative without first varnishing it; now many negatives are freely used with no protection whatever. The danger consists in the possibility of the water containing salts in solution which may impart a hygroscopic character to the film, with the consequence of stained negatives, or, still worse, adherence of the paper in places to the film, which is ruinous to any negative.

As to the mechanical impurity, the suspended particles, they will be little noticed in many cases of negative washing when it partakes of the perfunctory character which too often is brought under our notice; but when an hour, or two, or three, is given to the process, it is quite possible for negatives to be seriously interfered with by the deposit of a fine film of these suspended notes to such an extent that the shadows are robbed and the surface made so rugous as to prevent a cleanly varnished negative being produced. The water in some neighbourhoods is so objectionable in this direction that one photographer of our acquaintance always rubs every negative with a plug of cotton wool before it is put up to dry.

It is most probable that an easier method would be found in the plan of tying a piece of some woven fabric to act as a filter over the mouth of the tap, and to permit no water to be used except what flowed through it. The gentleman we speak of, however, has tried this method, and informs us that the water supply is so turbid that he would have to put fresh filters almost every day or the taps would cease to act. For carbon printing, however, with water of such quality, or want of it, there is an absolute necessity for filtration before use if clean prints are considered an essential to good work—the gelatinous surface being eminently adapted to hold small particles of matter, while, at the same time, there is no remedy against those particles imprisoned at the time of transfer.

The nuisance of lime salts in the water is well understood by those using oxalate developers. There are some photographers who keep their washing water in depositing tanks, in which a certain proportion of oxalate of ammonia has been previously dissolved.

In connexion with the water supply, the question of water meters is sure to come to the front, and where they are placed, the photographer usually finds he has a heavy bill to pay, and too often complains that his meter must be wrong. Now, it is quite certain that in the majority of cases his meter is not wrong, and that he uses a quantity of water far in excess of what he believes to be the case. We have come across several instances of so-called "injustice," in which the water meter is a very sore topic with the photographer.

We may conclude our remarks on this little discussed subject by reminding our readers that the time of frosts and burst water pipes is at hand. It behoves all whom it may concern to take all necessary precautions in time, and, above all, to remember that, contrary to the popular theory, it is the frost, and not the thaw, that bursts the pipes; hence, when a severe frost prevails, it is quite possible to avert the evil of an overflow by a timely examination of the pipes, when, if a burst

portion be discovered, it may be remedied before the thaw sets in and there are a dozen requests for a plumber for every one workman that is available.

THE knowledge of the destructive action of the products of gas combustion upon books—and by parity of reasoning upon photographs—cannot be too strongly impressed upon photographers; given an entire absence of gas and the silver prints of the world would have a nearly doubled lease of existence. The subject was recently well put before his audience by Mr. C. J. Woodward, who described a series of experiments at a meeting of the Library Association; and in the discussion following Professor Tilden, of Mason College, thought that in actual experience the injury was even greater, much greater, than in experiments, because of the rise and fall alternately of the temperature following the lighting and extinguishing the gas. When the gas was lighted a film of moisture was deposited on all exposed objects, which moisture contained small quantities of sulphuric acid; while the moisture evaporated the acid remained behind and accumulated by degrees till the books, &c., were spoiled.

Our photographers, experienced in the mysteries of collodion manufacture, will be amused by the description of a recent patent for the manufacture of gun-cotton and its mode of solution by new and cheap solvents, when we inform them that the new method of manufacture consists in using sulphuric acid and nitrate of potash in lieu of the former acid and nitric acid, and that the new and cheap solvent is produced by distilling a mixture of methylated spirit, resin, gum benzoin, and castor oil at a temperature of about 300°! Further, the preamble suggests that while the product of the mixed-acids process is explosive, the substitute is not! Surely the patent laws want amending if they permit any one to take out a patent under such pretensions as these.

For many years past the popularity of pictures on opal glass has been a source of considerable profit to most portrait photographers. The public have, hitherto, been well content to pay a much greater price for these pictures than they would for similar work on paper, although the actual cost of production need not be proportionately greater. Now, we understand, many photographers fear there is a prospect of prices for this class of work becoming considerably reduced. During the last two or three years photographs on opal, chiefly copies of pictures, have been utilised for "Christmas and New Year's Cards," and sold for a small or a moderate price even when coloured. Now, portraits of celebrities are being made on opal and sold at about the same price as those on paper. A few days ago we saw in a stationer's window, in one of the most fashionable thoroughfares in the Metropolis, portraits of actors and actresses, printed in carbon on opal glass, and bearing the name of a well-known house, for sale, retail, the small size at one shilling and the cabinet size at two shillings each. Of course a carbon print on opal costs no more to produce than does one on paper, beyond the difference in price of the two materials—and now the glass is very cheap. However, it is a matter of opinion with many portraitists whether it is good policy, commercially, to issue this class of work at so low a price. But we presume that every one must be allowed to know his own business best.

THE press notices of the Photographic Exhibition have been fewer than usual this year. What has been said, however, is, on the whole, favourable to the Exhibition and the advancement made by the art. The *World*, whose opinion is exceptional in this respect, has some very severe strictures upon some of the pictures, the awards of the jurors, and the Society generally. With regard to retouching, our contemporary remarks, "As to the fashionable cooking and stippling of the sitters' faces until the texture of the skin is like nothing but that of white kid-gloves, the Society seems to regard it as a triumph of the art." He also comments strongly upon those pictures which for some months past have been used for advertising purposes, which it must be admitted they have, and which he condemns, being awarded a medal, and suggests that, "At this rate of judging, a new photographic

society will be needed unless the present one promptly mends its ways." What does the Photographic Society of Great Britain think of this?

WE, ourselves, have heard some very strong comments upon the amount of retouching which is to be seen on most of the portraits exhibited, both on the prints themselves as well as upon the negatives. Some persons have remarked that it is difficult to discover how much of the work is really due to the operator and how much to the retoucher. There is no question whatever that thousands of negatives are now passed in the dark room as being sufficiently good, when retouched, which would not twenty years ago have been tolerated for a moment except in third or fourth rate studios. As one of the primary objects of every photographic society is the advancement of the art, would it not be well, in future, to place at the disposal of the jurors a certain number of medals to be awarded only to pure photographs? What has been said with regard to retouching in portraiture applies to every other phase of photography in the Exhibition, including enlargements, photogravure, &c.

JUST now portraits of large dimensions, taken direct, are being produced in greater numbers than at any previous period, thanks to the rapidity of gelatine plates, which permits of lenses with a small angular aperture being employed. Many of these pictures are printed on the ordinary albumenised paper, but it is to be hoped that they will prove more permanent than the majority of the small silver prints now issued. As these pictures are now finding favour in public estimation, it will be a pity if their run of popularity should be cut short through their evanescence. When a picture costing but a few shillings fades, very little is thought of the matter, but when one costing as many guineas is in question the case will be very different. It is to be regretted that these large portraits are not printed by one or other of the permanent processes. Sitters cannot be expected to pay large amounts for portraits which will fade away after the lapse of a few years; sometimes even a few months is sufficient to produce a marked change in the appearance in some modern silver prints. This kind of thing will certainly tend to bring large direct portraiture quickly into disrepute.

THE efficient washing of such silver prints is by no means easy to accomplish. If they were treated as small ones usually are, they would frequently get torn or crumpled in the operation. Putting a number of large prints, or even a few, in a vessel of running water is a very unsatisfactory method, as, generally, they will be found sticking together, thus preventing the thorough elimination of the hyposulphite. The best plan of washing the "hypo" out of these prints is that recommended by us a few months back for removing the hyposulphite from bromide enlargements, when the aqueegee is advantageously utilised. This plan involves a little more trouble than simply putting the prints in running water and leaving them for several hours, but it is far more efficient. With expensive pictures a little extra trouble can well be afforded. Moreover, as the washing by this method is quickly performed, the brilliancy of the picture is better preserved than when it is subjected to a prolonged soaking.

AN important feature in the present Pall Mall Exhibition is the generally improved taste displayed in the framing of the pictures. Many of the glaring eccentricities—not to say incongruities—shown on several former occasions, and upon which we strongly commented, are this year conspicuous by their absence. Hitherto, some exhibitors would seem to have imagined that the object of the picture was to show the frame off to the best advantage, instead of the frame setting off the picture. Plain unpolished oak, with a gold flat, appears to be the most favoured style of framing, and it is questionable if there is a better to be found for the majority of photographs. One great advantage of these frames for exhibition purposes is their durability; they will bear more rough usage without injury than most other frames, and if they do happen to get injured by rubbing, or are made dirty, a little water and a sponge, or a piece of glass paper, will soon put matters right.

THE PHOTOGRAPHIC EXHIBITION.

III.

LYDDELL SAWYER (No. 41), *Home, Sweet Home*, and five other *genre* pictures constitute the exhibits this year by this promising photographer, who has not shown any work for some years. We congratulate him upon the possession of that artistic faculty which, if accompanied with perseverance and persistent study, must, sooner or later, lead to success. There is much cleverness of design in the leading idea of each picture, although in some instances this has been slightly neutralised by a redundancy of accessories, which the painter can keep down by local colour, but which the photographer can only subdue by the objects themselves being altered in local colour; this constitutes a stumbling-block to many ambitious students in photographic picture making, examples of which are in this Exhibition. This picture of *Home, Sweet Home*, is the best of the series. A father reclining in his chair is holding the baby at arm's length, the mother kneeling on the ground at his side, both gazing at the baby. These are the materials forming the picture, which is aided in composition by the cradle and some drapery. We are sorry to find that the brush has been used too much to make good one or two minor defects; however, despite this, there is an evident attempt in this and the other pictures to compose and work out by photographic means pictorial aspirations. They are all printed in platinotype and in a well chosen, good engraving colour, which considerably enhances their effect.

George Davison (Nos. 64, 65, 66), *Cottage Studies*.—Here we have some good examples of picturesque bits, where the figures have been studied for just their proper position, and the whole dominated by sunshine, which is so valuable when photographed well, the shadows being liquid and transparent. Again we have here platinotype with an excellent colour. These series are marked "not for competition," showing (like others on the walls) that they are exhibited by the Judges of pictures.

M. Chubb (No. 70), *Christian Martyr*.—A three-quarter female figure leaning or tied to a thick pole or stake, being a very ambitious attempt to utilise photography for representing deep expression and poetical sentiment; but we do not sympathise with this young lady, and it must be a good model who could pose for such a picture. And, beyond that, there must be the moulding of the materials to the artistic conception of such a picture, which we fail to trace in this one.

J. C. Andrae (No. 72), *Vieus*.—A frame of small, very good views, by one of our veteran photographers, where the "objective" has been attended to more than the "subjective."

G. West & Son (Nos. 79 to 85), *Yachts, &c.*—We look forward year by year with anticipations of pleasure for the yachting season in Pall Mall East, and we are not disappointed. There we can enjoy pictorially the breezy atmosphere and the rolling waters, and follow the fast sailing yachts, as with sails outspread and bending masts they speed on their noiseless path. Given, then, the fact that these photographs can suggest these ideas, how much is due to the individual photographer who produces them? There must be great mastery over all the appliances, and a quick perception of some graceful position to be immediately secured, whatever may be the standpoint of view, whether on the deck of a comparatively steady steamer or in a boat rollicking about on a choppy sea; under any circumstances great praise is due to all who produce such beautiful pictures. Each of these pictures being separately framed enhances their pictorial value.

F. Whaley (No. 91), *Preparing for Boxing Night*.—This is another of those pictures requiring much study and executive skill to realise the subject. It is one where the realistic must of necessity pervade the whole of the presentment, and so far it is a fair example of what can be done by photography. But, again, we must observe that the accessories introduced (and this applies more particularly to the background) are much too powerful; they come forward, and the figures consequently do not stand out enough. They are embedded in masses of dark matter, which destroy the keeping of the various figures. It is a family all engaged upon preparing for the event. An elder daughter is dressing up a younger one for some character, the father is getting ready the clown's poker, whilst the mother is ironing some part of the dresses. A very good subject, and if the background had been much lighter in tone the effect would have been much greater.

F. Bedford Lemere (No. 92), *Interiors of Beau Manor*.—Very difficult subjects to get perfect results from; they are rather spotty in effect and are crowded with furniture, which detracts from that realisation of magnificence which the rooms themselves must undoubtedly possess. A softer effect in treatment would have much improved them.

William Parry (No. 97), *Chilian Armour-clad (Steam)*.—This is a very well executed picture, showing great mastery over appliances. The steam vessel is coming on slightly inclined away from the camera. The exposure must have been very short, and, therefore, the amount of detail on the ship is very good.

J. M. Nisbett (Nos. 99, 100, 101), *Studies*.—These are attempts at making pictures, which just deserve some little notice. They are too much like diagrams in pose, but still evince a departure into a higher phase of study, which may result in better work another year. William Brookes (No. 102), *Panel Portraits*.—These show again an attempt to go beyond the ordinary studio work, which will carry the exhibitor into still better results. In the same frame are four small studies of vessels, which are very pretty; as also some book illustrations, where figures and flowers are introduced with good design.

V. H. Chintamon (No. 103), *Indian Celebrities*.—These are panel portraits of some of our late Indian visitors, being men of culture, and evince some knowledge of art in their pose, and, considering the difficulties presented by local flesh colour, are very successful, and especially so in the expression of the mental individualities of the various personages.

Valentine Blanchard (No. 108), *Portrait*.—This portrait comes upon us with a vast amount of satisfaction as showing the result of much artistic skill in the pose and general treatment; particularly notice how expressively the hands have been arranged, and which evidently is most successful as a likeness. There is a quiet repose about this work which might serve as a model for imitation. Cellerier Syndicate (No. 117), *Portraits*.—There are several of these portraits (large panels) in the Exhibition which are very good examples of studio work, being cleverly manipulated, and arranged with good taste.

F. Downer (No. 121), *A Private Rehearsal*.—Another of those attempts at picture making which we have previously called attention to. Four boys getting ready their various musical instruments. A good idea, but falling short in that treatment which artistic perception calls for.

E. Davey Lavender (No. 124), *Gentleman in Fancy Dress*.—There are many excellent points about the figure, which is a large one (direct); the pose is good, and so are the hands, but the whole effect is ruined by the background, which (to a figure containing light and dark masses locally impossible to alter) requires to be modulated and adapted especially for that purpose. Strictly speaking, a proper background for this picture would exercise all the artistic ability of any painter.

School of Military Engineering (No. 134), *On the Thames*.—Four large pictures in one frame. The views are very well chosen, and would have been exceedingly pretty but for the masses of under exposed or under developed foliage which permeate the whole of the pictures. Most assuredly the natural originals must have suggested ideas of beauty and repose, which it must be conceded these photographs hardly do; and similar remarks must in all sincerity be made about No. 156, *Burnham Beeches*, also by the same exhibitors. Now the charm of these celebrated trees consists in that wonderful grey and peculiar colour which clothes them in such poetic and far-away beauty, therefore light and bright sunshine must attend upon them—this would vanish as night approached. Now which of these ideas are suggested by these photographs?

Werner & Son (Nos. 135 and 158), *Portraits*.—These are two pictures taken direct; and here we will further allude to the large direct portrait work which characterises this Exhibition. All are steps in the right direction, as a direct photograph possesses a peculiar rich quality which enlargements never have, and as far as the technical quality goes, as time advances great improvements will arise, not so much in the chemical as in the optical department. Therefore our remarks upon all large direct photographs will be almost from the art side. In the portraits now under consideration we think that if actual life size had been the scale (and this refers

most especially to the portrait of the gentleman) that they would have gained in power; being almost in profile, many difficulties have been done away with. This is quite right for form, but the quality of expression becomes somewhat reduced. And we must refer to the quality of the retouching, which upon these large heads is not so strictly in accordance with an educated artistic manipulation which such large work necessitates. These have far too much of an ivory surface, which is quite out of character with individuality, especially in gentlemen's faces. Nos. 136 and 157, by the same exhibitors, being three-quarter size, are more successful. The pose is very good, and the hands (that difficulty to most photographers) have been well arranged, but we think that the figures might (for the space occupied) have been taken larger with considerable more advantage. However, the whole set possess admirable qualities.

W. J. Byrne (No. 144), *At Home Photographs*.—Here in one frame are fifteen portraits at the homes of the sitters, and, as showing what can be done without a studio with all its possibilities of lighting, are very successful; at the same time, probably from all being mixed up together, each does not get its due meed of satisfaction. Many look as if "the shades of evening" had come o'er them and retire into obscurity.

Warwick Brookes (No. 145), *Portraits taken Direct*.—Again we have to review some more large work, and the optical difficulty previously alluded to comes in here with more force; otherwise the head of a gentleman is very good. A test for these direct large heads is this: Retire a long way off from the picture, and note whether the atmosphere intervening affects the light, and more especially the shadows or shade. Now in this instance the head of the gentleman acquires a vast amount of rotundity and solid appearance, the dark parts do not become obscure and the optical defects not so apparent. Respecting the lady's portrait taken smaller (whilst remarking that the arms are not well arranged), we wish to allude more particularly to the mouth, and this will apply to all the mouths of the large portraits of ladies. That they do not seem to give the life-like presentment, something is wanting; the modelling somehow must be wrong, or is due to the retouching, which has destroyed that most characteristic part of all mouths, the "termination" or "stop" at each side. Now, this is one of nature's most important markings and should receive every possible study.

E. Davey Lavender (No. 137), *Miss Tomlinson*.—This is another large direct portrait of a young lady where the background is made subservient to the figure. It has a little too much contrast, but the figure stands out. The skipping-rope held in both hands is laying on the ground, and produces a curious effect, acting as a kind of base. This is not artistic, and might have been easily altered. It shows how a small matter may otherwise spoil good work.

THE APPARATUS.—II.

MR. GOTZ exhibits his improved camera and Volute shutter. Of the former we have already spoken on the occasion of its first production, but instead of using, as he intended, a vertical pinion and circular rack to guide the swing which is from a point near the centre, he now has a horizontal pinion and rack, the pinion going *over* the rack, so that the movement, though perfectly smooth, is one confined within the exact arc of the angle from the centre to the corners of the camera, the rack being, so to speak, wedged in between the pinion and the baseboard.

In the volute shutter we notice an arrangement for time exposure carried out with great nicety. On the fly wheel is fixed a small crank, which for any ordinary instantaneous exposure is entirely within the circumference of the fly wheel and allows this latter to make one complete revolution. When, however, turned round so as to come on the outside of the fly wheel it forms a stop, just at the moment when the shutter is fully open, being caught up by the locking lever and kept in that position until released by pressure on the air holder, when the shutter speedily closes. It is only necessary to keep the shutter at a tension of three or four turns to work this very handy time exposure, during which the shutter can be entirely left to itself.

There is also a view meter attached to the camera consisting of a linked or jointed frame of metal. This is raised from the back of the front board, and when looked at through an eye-piece suitably adjusted at the back of the camera, presents exactly the same amount of

subject matter to the operator as will be refracted by the lens on to the plate, the angle varying with the lens as the camera is racked out or in. This view meter can also be applied at the side of the camera.

Among the lens shutters is one by Messrs. Reynolds & Branson, of Leeds, constructed on the same principle as others of theirs which we have described with drawings on previous occasions. This one, however, while differing in certain details from the others, is also made for stereoscopic purposes.

Not having access to the locked case of lenses exhibited by Messrs. R. & J. Beck, we are of course unable to say anything concerning their merits. But a loose mount, without lenses, on the table affords one an opportunity of examining and admiring the working of the "Iris" diaphragm with which it is fitted.

For those who prefer to develop their negatives when away from home or on a tour, Messrs. G. Houghton & Son cater by their exhibition of a *multum in parvo* Photographic Development Portmanteau, fitted with every requirement for the purpose intended.

THE LATE MR. ROBERT HUNT.

HAVING just entered upon his eighty-first year, Mr. Robert Hunt, F.R.S., has passed away from amongst us.

Hunt's *Researches on Light*, published in 1844, when he was Secretary of the Royal Cornwall Polytechnic Institution, gave a powerful stimulus to the then incipient art of photography. We are well aware that it proved the means of many scientific men entering this field of research. Having passed into a second edition it then assumed the phase of *Hunt's Photography*, and formed one of the volumes of the *Encyclopædia Metropolitana*. For a long time, and in one or other of the several editions through which it passed, it was the handbook of the art most sought after, being especially valued on account of the historical matter in which it abounded.

Mr. Hunt in 1850 compiled with much care a general summary of the history of photography for the British Association, given in a tabulated form. From this we learn that he himself was an assiduous experimentalist during the years 1842, 1843, and 1844, in the last of which he discovered the developing powers of photosulphate of iron, which afterwards became, especially for wet collodion, such a power in the hands of working photographers. His labours embraced researches (for photographic purposes) in the salts of chromium, nickel, lead, manganese, copper, iron, mercury, platinum, gold, and silver.

He was one of the founders of the Photographic Society in 1853, and was a member of its first Council, and at its second meeting contributed a paper, *On the Principles upon which the Construction of Photographic Lenses should be Regulated*. He was the author of several works bearing on science; he contributed to several scientific periodicals; and as a lecturer was singularly attractive.

In his later years Mr. Hunt was Professor of Mechanical Science in the Government School of Mines, and up to the time of his death was Keeper of the mining records at the Museum of Practical Geology. For many years he has not mixed in photographic circles, nor taken any special interest in the art once so well loved by him.

He died on the 17th inst.

WRITING AND DRAWING ON GLASS.

IV.

Etching on a Collodion Film.—In the previous articles we have considered the subject of writing upon clear glass with pen and pencil; I propose in this one to discuss some of the methods that may be used to give a negative of a sketch—that is, a picture consisting of transparent clear lines upon an opaque black ground. If a good negative is secured, it is obvious that the required number of positive duplicates can be obtained by any photographic printing process. The usual way of producing such a negative is to make a positive drawing on paper, which is then photographed; but a simpler method is to etch the lines in an opaque film spread on glass. Such a film must evidently have special qualities. It must adhere sufficiently to the glass

to prevent chipping; it should be comparatively soft, so as not to offer much resistance to the etching needle; when completed, it should bear handling without suffering injury thereby; and in order that fine work may be done, it should form a very thin layer on the glass.

Collodion naturally suggests itself as being a suitable material for such a film, and to a certain extent it answers very well. Plain collodion, with the addition of a few drops of Canada balsam dissolved in benzole, adheres firmly to glass, and will bear being etched without chipping—the only drawback is that it is not very easy to produce an opaque ground with it. Probably the most perfect result would be obtained by depositing a layer of silver, as in the wet collodion process; but we will put this aside, as a simpler method is desirable. We can produce various colours with the aid of dyes, and if a coloured ground will suffice, nothing better can be had than dyed collodion. The dyes most suitable for this purpose are those soluble in alcohol, such as the magenta serics, aurine, rosine, violet of methylaniline, &c., a greater depth of colour being obtainable thus than by using those soluble in cold water. The dye should be dissolved in a little alcohol before being added to the collodion; in the case of aniline blue, eosine, &c., which are insoluble in spirit, we must employ water instead—this should be used very sparingly, in order to avoid precipitation of the pyroxyline. The best way to dye a collodion film, if we desire a very dark or opaque tone, is to coat the glass with thick, colourless collodion, and when the film sets to immerse it in water until the greasiness disappears. The plate is then transferred to a strong solution of the dye in either alcohol or warm water. The film being in a spongy and porous condition it absorbs a large quantity of the colour, and a greater depth of tint can be had in this way than we should be able to secure by adding the dye direct to the collodion in the bottle. When sufficient colour has been acquired by the film the plate may be removed from the liquid and reared up to dry.

It will be found that a collodion film does not retain more than a definite amount of colour; if this amount is exceeded there will be a bronzed appearance on the surface, the colour will be dull, and the film will have lost its toughness, and is apt to chip if an attempt is made to etch it. Hence a thick film is required for a very deep colour. If the collodion should still chip or shell off, the plate may be dipped into a weak solution of gum or sugar and redried: this treatment will generally cure the fault.

Having secured a plate with a coloured film to our liking, we can proceed with the etching. For this purpose we require a tool, which may be a handsomely mounted affair bought from an artist's dealer, or we can use a large needle, or even a sharp-pointed penknife, with equally good results. The quality of the work depends, of course, on the skill of the draughtsman. It may be as well to state that strong light should not be used, as the finer lines would then look much thicker than they really are, owing to irradiation; and if these lines are made too fine, it will be necessary to give a protracted exposure in the printing to produce any visible effect. Such an exposure would tend to cause halation in the thicker lines, and a poor print would be the probable result.

When we have completed the etching, mastic varnish may be applied if a protective coat is desired; it would not be safe to use shellac varnish.

Etching on a Tinted Matt Ground.—If a coloured film of a semi-transparent nature is desired upon glass as a background to a sketch etched thereon, we can get excellent results by proceeding thus:—Gum sandarac is dissolved in methylated alcohol to the consistence of varnish, and the solution is mixed with an equal bulk of ether. This fluid is then brought to the required depth of colour by the addition of a concentrated tincture of dye, and finally plain collodion is added to the extent of about five per cent. A glass being cleaned, the above mixture is poured on the cold plate in the way matt varnish is used. The result is a very even matt film, of a pleasing colour, tending to greyness; it is easily wiped off the glass, but the finest lines can be etched thereon without any chipping taking place. When finished, it may be protected with mastic or dammar varnish prepared with benzole—the latter will take away the matt appearance, but the colour will not be affected. The work done in this way, owing to the peculiar softness of the tint, has a more artistic appearance than

we should get by using plain dyed collodion. By varying the proportion of the ingredients different effects will be obtained; if the collodion is increased in quantity, the colour will be brighter, and the matt appearance less pronounced, and by adding a trace of Canada balsam to the solution, the film will adhere more firmly to the glass, and will be in less need of a protecting varnish.

Etching on Smoked Glass.—Perhaps the simplest and best known method of producing an opaque black layer on glass is to hold it over a smoky flame, so as to cause a deposit of carbon upon the surface. It is easy to get complete opacity by this means, and afterwards to produce an etching on the film. The chief difficulty lies in the varnishing, as some protection is absolutely necessary, owing to the extreme tenderness of the deposit, which can be removed by such slight force as a puff of wind. If we apply varnish we are almost certain to ruin the work, through displacement of the lampblack, and in the case of a clear glass smoked to opacity, the etching point will be apt to remove too much of the pigment, so that fine lines cannot be easily produced.

The use of a substratum of sugar or gelatine on the glass before it is smoked will improve matters, as the soot then adheres better, and less displacement will occur in the varnishing, especially if plain collodion is used; to assist the latter to flow the film may be previously impregnated with alcohol by holding the cold plate over boiling spirits of wine. Burning camphor can be employed to produce the smoke, but perhaps the most convenient method is to use a benzoline sponge lamp; if the wick of the latter is well turned up, we can get smoke almost enough to suffocate a sweep. By the aid of the substratum on the glass before it is smoked, and the use of the alcohol vapour to assist the varnishing, we may obtain very good results; fine lines can be traced, complete opacity of the ground secured, and the work can be efficiently protected by varnish. But I can scarcely recommend the process, because there is an easier method open to us, which is as follows.

A clean glass plate is coated without being warmed, with a solution of gum dammar in ether; the exact strength of the varnish is immaterial, though it should not be too weak. When the ether has evaporated, we can light up our smoke factory—the benzoline lamp—and hold the glass, film downwards, in the flame, moving it about with a circular motion to prevent the heat being concentrated in one part, which would probably crack the plate. The centre of the flame consists of vapour of benzoline, which softens the dammar to such an extent that the soot is absorbed by the film as fast as it settles thereon. If this simple operation is properly done, a quarter or half plate sized glass can be smoked to opacity and will have a smooth, bright surface, which is in excellent condition for being etched, and is quite hard enough to form its own protection—that is, it does not require varnishing.

ALBERT WM. SCOTT.

PHOSPHORESCENCE AND PHOTOGRAPHY.*

August 12, 1875, *Experiment 5.*—Placed exposed uranium paper on sensitised side of silver paper, and examined after four-and-twenty hours. *Result:* Darkness on the *wrong* side still more marked; right side *bleached*. Ends (see the figure of the cross), general slight tint as from paper growing old. *Inference:* This being a repetition of Experiment 3 the inference is the same.

Experiment 6.—Bichromatised two sheets of paper. Dried one in the "dark," the other in the sunlight, and left the latter exposed for several hours. Placed a piece of the exposed paper at the bottom of the box already named. Covered the top of this latter with a piece of common writing-paper long kept in the dark and having a circular hole in the middle of it about the size of a penny piece. Covered this with the piece of bichromated paper, dried in the dark. Placed a book over all. Examined after eighteen hours. *Result:* No image whatever. *Inference:* That paper impregnated with bichromate of potash and exposed to light (with the result, of course, of reduction and change of colour) does not radiate to any material extent, if it radiates at all, energy capable of darkening the bichromated paper hitherto unexposed. This is but what one would naturally expect. The energy of the light, having been already used, is not as radiant energy available for use again.

* Concluded from page 629.

Experiment 7.—Placed bichromatised but unexposed sheet under an exposed uranium strip in the manner shown. Enclosed in a book and left for eighteen hours. *Result:* Decided printing under uranium paper. A very decided brown. *Inference:* That exposed uranium paper acts energetically by contact in the reduction of bichromate salts as well as those of silver.

August 14, 1875, Experiment 8.—Bichromatised a strip of paper, dried, and exposed to the light of two consecutive days, and placed on standard silver paper (see diagram, Fig. 3). Enclosed in book and examined after eighteen hours. *Result:* Discolouration of the silvered paper where the bichromatised paper was not, and no discolouration where it was. Discolouration where it was not equalled that of a piece of the same paper hung in the air of the dark room, and which had been discoloured by the circumstance of "keeping." *Inference:* That the exposed bichromatised paper had actually prevented the discolouration of the argentic paper.



Fig. 3.

Experiment 9.—Steeped paper in a solution of ferrocyanide of potassium, dried, and then immersed in a solution of iron protosulphate and dried again. The paper, of course, was Prussian blue. Exposed to two days' light and placed on standard silver strip (Fig. 3). *Result:* After eighteen hours of darkness same as the above, viz., tinted ("by the lapse of time") where not covered by the ferro paper, and tint equal to that of standard paper suspended in the "dark." But where covered by the iron paper the silvered paper was quite white, and seemingly even a little bleached. *Inference:* That silvered paper is also prevented from decolourisation "by the lapse of time" when in contact with paper impregnated with cyanide of iron which has been exposed to light (and, of course, very possibly when in contact with cyanide of iron paper, which has not).

Experiment 10.—Soaked paper in solution of ferrous sulphate, dried, and exposed to two days' light. Laid on standard silver paper as before. Examined after eighteen hours of isolation. *Result:* Very faint tint where the paper was seen only by transmission. *Inference:* That paper impregnated with iron protosulphate and exposed to light does act feebly on argentic chloride.

Experiment 11.—Card mount covered with very thin solution of isinglass, and then profusely sprinkled with bichromate of potash in very fine powder and in excess. Exposed for some hours to sunlight. Placed at the bottom of the four-inch box and both standard silver and bichromate paper placed upon the top. Examined after eighteen hours of isolation. *Result:* No visible effect. *Inference:* The crystals of bichromate, after exposure to the sunlight, do not to any appreciable extent radiate energy capable of inducing photographic action either on bichromate or argentic chloride papers.

August 16, 1875, Experiment 12.—Paper soaked in solution of uranium nitrate and exposed to the light of several days was placed on standard silver paper (Fig. 3). Examined after eighteen hours of isolation. *Result:* Preservation of the silvered paper on its contact face, but strong reduction on the wrong. *Inference:* That uranic nitrate paper, after prolonged exposure, suffers reduction in itself, and that its first action is reversed. The back reduction, however, is mysterious.

Experiment 13.—Paper was soaked in a solution of platinum bichloride, dried, and exposed to light for several hours. It was then placed on silvered paper as before, and after eighteen hours of darkness it was found to have preserved the paper in contact with it. Where not in contact the paper was discoloured. *Inference:* That platinum paper, after exposure to light (and probably without exposure), acts as a preservative of the sensitive paper in contact with it.

Experiment 14.—Paper was soaked in a solution of tartaric acid, dried, and exposed to the action of light. Placed in contact with standard silver paper, and isolated for four-and-twenty hours. Where in contact the paper was found to be uniformly darkened, and that considerably.

August 27, 1875, Experiment 15.—A sheet of plain photographic paper was cut in two, and one half hung for a week in a collar from which all light had been excluded for many months,* and the other half was hung, also for a week, in a room to which sunlight had free access. Both halves were then salted in the collar in the feeblest light—that of a reading lamp remotely placed—in which the operations could be performed. Prior to salting the halves had been marked in pencil, one with the letter A (the dark half), and the other with the letter B (the half which had been exposed to light). When dry, both halves were silvered in the feeblest of yellow light. After this they were hung remotely from each other for a week. *Result:* "A" remained quite white; "B" had gone deep brown. *Inference:* That the spontaneous discolouration of sensitive paper results from, or is largely contributed to by, the energy capable of radiation which it has previously received in the operations of its manufacture, i.e., from the radiant energy it has received and stored, and (of course) not from the "lapse of time." I propose in another article to summarise and discuss the results which I have here detailed. The experiments I have described will be admitted to be of interest and importance, and it is much to be regretted that in my prolonged absence on the Continent and elsewhere about nine-tenths of my records should have disappeared.

D. WINSTANLEY.

PHOTOGRAPHIC VARNISHES.

THE query recently put by Mr. Shane reminds us of our unfulfilled promise to write a sequel to our remarks upon varnishes in the article he refers to. We may here repeat what we then said, that our experiments upon varnishes have been most numerous, and have extended over a long period of time, hence whatever formula we now offer to our readers may be relied upon as the outcome of those experiments; more, they are in use by photographers of eminence to whom they have been given in times past.

Before giving these working formulæ we may refer to a class of recipes which is very popular among those who make their own varnish. We refer to those which consist simply in diluting "hard spirit varnish" by spirits of wine till the product is of the right strength for photographic purposes. There are one or two objections to these formulæ, which, to our mind, are insuperable—to wit, "spirit varnish," whether "white hard" or "brown hard," is an utterly indefinite compound, varying in composition at every varnish maker in the country. The main constituents of the brown are shellac and sandarac, with a certain modicum of a turpentine varnish, while the white has little besides sandarac, with, perhaps, Canada balsam. In the brown the sandarac is often replaced by common resin, while in some white of extreme quality, mastic is to be found occasionally. It will thus be seen that it is practically impossible for photographers to compare notes of experience on such formulæ.

To come now to the sheet-anchor of the photographic varnish maker, shellac, orange or white, let us say at once that our preference is in favour of a mixture of the two. It is a most simple matter for any one to try for himself the experiment of making three kinds of varnish, and trying their powers. The experiment, too, is instructive. Let three bottles be procured, and into each place, say, two ounces of alcohol, then add ninety grains of white shellac to one, the same quantity of orange shellac to the next, and an equal weight of sandarac to the third. After each quantum of resin is thoroughly dissolved, and the liquids either filtered or allowed to stand till clear, let a plain piece of glass be varnished with each. It will be found that the orange lac gives the hardest, the white lac the next, and the sandarac the softest. There need be no comparison of testimonies, let each try for himself. There cannot be a doubt of the result, beyond that so unsuitable will the sandarac be found, that if the plate be put away for a few weeks the sandarac will most probably have partially shelled away from the surface.

The white lac will be found to give the thinnest solution of the three, on account of there being in all white lac a far more considerable proportion of insoluble matter than in orange, although there is a wasteful amount of deposit in that resin. It is, therefore, evident that the proportion of white lac in a varnish is not represented by that in the formula itself. Here now is our recipe for a photographic varnish of which there has been made very many gallons in

* My residence in 1875 was at "The Doctor's Cottage," South Shore, Blackpool, near to which I am living now. At high tide and during storms the house was frequently surrounded by the sea. On these occasions it was necessary to "clay up" the cellar windows, doors, and so on. As I had no particular use for my cellars, I left the windows "clayed up" permanently, and it was in these cellars that my "dead dark" experiments were performed.

the old wet-plate days. For dry plates the quantity of spirit may be doubled, or even a still larger quantity added:—

STANDARD PHOTOGRAPHIC VARNISH.

White shellac	8 ounces.
Orange shellac	4 "
Sandarac	1 ounce.
Alcohol	60 ounces.

Place in a wide-mouthed bottle of at least half a gallon capacity, and add to it about half a pound of broken glass. Shake at intervals until dissolved, and, after allowing to settle for a month, decant. Some experimenters have recommended the addition of plaster of Paris, to hasten and render more complete the tedious process of precipitation, for which filtration forms no effective substitute on account of the pores of any filter that can be employed so rapidly filling up. The object of the broken glass is to prevent the whole mass of resin caking together into a compact gelatinous mass which would refuse to dissolve in any reasonable time.

The above varnish gives a fine, clear liquid which dries to a hard, glossy, brilliant, durable coating of slight colour, and which we have not seen excelled. It is quite possible to use the orange lac alone, but the colour of the varnish is then so deep that most operators object to it.

A word now as to the white lac. We have seen many samples which have been completely insoluble through long or improper storage after manufacture, a condition caused most probably by the traces of chlorine left after precipitation in the course of manufacture previously described. As soon as purchased white lac should be stored in water, where it may be kept in a soluble condition for years. The experienced hand can generally tell by its appearance whether it be insoluble or not, the defective condition being usually indicated by an absence of that appearance of dead opacity characterising a good sample, and sometimes being coated with a kind of semi-transparent skin.

For ambrotype pictures, ferrotypes when resistance to friction is no object and freedom from colour essential, the orange lac is to be replaced by the same weight of white lac, and the alcohol trebled in amount.

Retouching varnish may be made by adding to each ounce of the standard varnish eight drops of castor oil; this will give sufficient tooth to enable the pencil to bite. The varnish will naturally lose in hardness of surface, but will not be materially injured. But those who prefer a hard varnish on their negatives to be followed by the addition of a "medium" to prepare it for retouching, will be suited by the following:—

RETOUCHING MEDIUM.

Gum dammar	70 grains.
Yellow resin	6 "
Turpentine	4 ounces.

Shake occasionally till dissolved. The use of pieces of broken glass is here also advantageous. It will be noted that we omit the usual "Venice turpentine;" we do it for the simple reason that in most cases this substance is a fraud. The stuff sold under the name is merely a mixture of turpentine and yellow resin. Our own recommendation, however, for preparing for retouching is to use a little friction with powdered resin; a splendid surface will be obtained, upon which any kind of effect may be produced.

As wet collodion negatives, especially for enlargements, are by no means the curiosities that some modern photographers imagine, we may point out a difficulty that may arise with our standard, or, indeed, any varnish. It often happens that an old picture is required to be enlarged by reflected light, and a carbon print obtained from it. This is most readily done by taking a wet plate negative, slipping the film off (which is readily done after first treating it with a solution of citric acid of twenty per cent. strength), and reversing it on to another glass under water. Now we find that a negative so treated is in the most repellent condition that collodion ever assumes. The varnish must be poured over such a negative backwards and forwards for a considerable period, often for two or three minutes; if this be not done the glass side of the film will have a most peculiar mottled appearance, which will be reproduced in the print. Of course all varnishes are subject to the same peculiarity, but we here name it, as we do not remember the warning having been before published.

We may possibly save our readers the waste of some amount of time in useless experimenting by drawing attention to a mode of treating shellac which a year or two ago went the rounds of, we should imagine, every scientific periodical in the two hemispheres.

As we have already explained, there is a great deal of waste in the manufacture of shellac varnish, owing to the large amount of insoluble flocculent matter contained in lac resins, and which occupies

even after long standing, fully one-fourth of the bulk of the whole liquid, and this mere represents so much dead loss. The ubiquitous recommendation above named stated (which was true) that this precipitate was in the main a kind of wax insoluble in spirit, but soluble in benzole, petroleum, ether, &c., and further said (which was not true) that it might be removed by shaking up with benzole or petroleum ether with the varnish, which would then separate into two layers. The lighter, the benzole, at the top containing all the wax, the spirit at the bottom with all the resin. Now, as a matter of fact, benzole is quite soluble in alcohol, and is in consequence inapplicable to the purpose, and petroleum ether is soluble to a considerable extent, and, besides, when mixed with the crude varnish does not cause the distinct layers described. The method is utterly and entirely worthless.

We conclude our article by pointing out a very singular property of alcoholic shellac solution, which was discovered some years ago by Mr. G. Watmough Webster, F.C.S., but which appears to be less known than it should be. Every one is aware of the difficulty of getting rid of the last trace of resin when it is found necessary for some reason or another to remove the varnish from a negative. Unless a most wasteful amount of alcohol is used, a scum will form on the surface, caused by the water precipitating the light amount of resin, and if this scum be allowed to form, it entirely prevents regular action in any future intensification or other treatment of the negative. But if a small quantity of ammonia be added to an alcoholic solution of lac, water may be added in any proportion without causing any precipitation whatever. A little ammonia in the spirit used for dissolving a lac varnish off will therefore prevent any scum forming. We have tried this and found it to answer thoroughly.

We believe we have now fulfilled our promise, and given concise working formulæ for varnish, which are thoroughly practical, and which it would be difficult, if not impossible, to excel.

—*Photographic Times.*

SOME NOTES ON THE HISTORY OF THE DISCOVERY OF THE GELATINO-BROMIDE PROCESS.

GELATINE was used for photographic purposes in France by Gustave le Gray in 1849, and a little later in Germany by Dr. Halleur. They employed it as a substitute for albumen and for collodion, the glass plates being coated with iodised gelatine, dried, and then sensitised by immersion in a bath of silver nitrate. But gelatine is soluble in acetic acid, which was then universally employed in developing solutions, and the "disappearance" of the image upon plates so prepared (as recorded by Halleur) was probably due to this cause.

"E. R., of Tavistock," describes a similar method in the *Photographic Journal* for May, 1854.

Gaudin, in 1861, used gelatine as a material to prepare what he called a "photogene," i.e., a liquid which merely required pouring on a glass plate to yield a surface sensitive to light. In this idea we see the germ of emulsion photography.

In a patent taken out in 1865, W. H. Smith includes "gelatine or any gelatinous substance" as a material for coating the surfaces of wood, canvas, silk, glass, &c., a resinous solution being previously applied to fill up the pores. Nitrate of silver dissolved in alcohol and mixed with a chloride, a bromide, or an iodide, was mixed with the gelatine. After exposure in the camera, a toning solution was employed. This does not strike one as a very promising process, but still the mention of gelatine makes it interesting.

Next we come to the work of two men—W. H. Harrison and Thomas Sutton—who each held for a moment the key to the secret, only they seem not to have appreciated its full value. In January, 1868, my namesake wrote an article* on the *Philosophy of Dry Plates*, in which he details experiments made with the view to obtaining an answer to a question even yet unsolved: "Why should one organic solution give a rapid plate and another a slow one?" A very weak solution of gelatine was prepared, in which "a little bromide and iodide of cadmium was dissolved, after which some nitrate of silver was added in the dark. In fact, I wanted to have a solution which would give a good dry plate by simply coating a sheet of glass with it." Plates coated with this mixture, which was really an emulsion of bromide and iodide of silver, were dried and exposed in the camera and then developed by the alkaline method. "The picture came out very rapidly, and was of great intensity, but the rough and uneven surface of the film made it worthless." When a stronger solution of gelatine was used no pictures could be obtained, a result possibly due to the weakness of the developer then in vogue.

Between 1855 and 1871 few men wrote more upon photography

* THE BRITISH JOURNAL OF PHOTOGRAPHY, January 17, 1868.

than Thomas Sutton, first as editor of *Photographic Notes* and later as a frequent contributor to THE BRITISH JOURNAL OF PHOTOGRAPHY. In the latter periodical for July 14, 1871, Sutton refers with interest to Gaudin's ideas. He writes: "There is something very ingenious and promising in M. Gaudin's gelatine emulsion. Used with bromide of silver instead of iodide, it might turn out something grand. The objection to collodion is that when it is allowed to get dry upon the plate without having been wetted it dries to an almost impenetrable skin, which the developer has scarcely any power of entering, so that the image is thin and superficial. This would not occur with a gelatine film. There do not seem to be any difficulties in spreading it as there are in spreading albumen, for it is applied hot and quickly sets. Oxide of zinc gives a structureless and homogeneous film when made into an emulsion with gelatine; bromide of silver ought to do the same. A gelatino-bromide emulsion, slightly alkaline, would be exquisitely sensitive without any free nitrate, and tannin, with the aid of the alkali in the film, would no doubt develop it perhaps to sufficient density without silver. A great advantage would be that the film could be composed of a capital organifier through its entire substance, instead of having a mere layer of organifier upon the surface. The process is well worth trying; it seems to be right in theory throughout." Then follows a description of Gaudin's proposed gelatino-iodide process; and Sutton winds up with a paragraph in which his hopes are realistically enough expressed: "A tourist, employing the above process, would have his bromide of silver emulsion ready made in a semi-solid state, resembling *blanc-mange*; he would melt it by putting the bottle containing it into boiling water; he would then coat his plates at night for the next day, and put them at once into the plate box to get dry. No washing of the plates would be required, and that is one grand feature of the process. The next morning he would hang a yellow curtain before his window and put them into the dark slides, developing them at night. He would have no dangerous, explosive, strong-smelling, unhealthy collodion to carry about with him on his travels, and he might pack in a very small compass enough chemicals in a dry state to last him for a tour round the world. What a blessing it would be to be independent of collodion, and at the same time not to have to trust to the keeping qualities of dry plates! It may turn out that I have done well in digging up this old process of M. Alexis Gaudin, whose name be exalted as the author of collodion emulsions and photogenes!"

A few weeks later, Sutton writes (THE BRITISH JOURNAL OF PHOTOGRAPHY, September 22, 1871): "We seem to be advancing now towards a revolution, both in negative taking and printing, and gelatine may ere long prove to be as important an agent in the former process as it has proved to be in the latter. We have had 'gold *versus* old hypo,' 'collodion *versus* paper,' 'carbon *versus* silver' . . . and ere long it may be 'gelatine *versus* collodion.'"

Yes, Sutton was on the right track; but there is no evidence to show that he, any more than his predecessors, was successful in obtaining even a single decent negative by any process, relying mainly upon the use of gelatine and some salt of silver. Sutton did not live to see the complete realisation of his hopes. He died at Pwllheli, North Wales, on March 19, 1875. Of all the men of the past whom I should like to "call up" to see the modern development of photography, Sutton and Rejlander stand first. The scientific simplicity of the gelatino-bromide process would have appealed to the former as strongly as its capabilities for art work would have affected the latter, and each would have made noble use of our modern "dry plates."

W. JEROME HARRISON, F.G.S.

(To be continued.)

REMARKS ON PHOTOGRAPHIC CONVENTIONS BY A VETERAN.

I HAVE been asked to give my opinion as to whether the holding of conventions is beneficial to the fraternity. I say most emphatically, Yes. I wish no better evidence of this than the fact that when the good old N. P. A. gin-out, the photographers felt the need of another association, and organized one promptly. I believe it to be a grand thing to get together, show the best work of members, compare notes, discuss processes, &c. I believe it to be good management to change officers often, and always advocated such change in the N. P. A., but the Association thought differently. I have frequently given as my opinion that the offering of premiums, medals, &c., is not a good feature of the P. A. of A. It will always cause dissatisfaction, as my experience has shown me that nearly every photographer believes himself to be the best operator in this country, and if twenty compete

and each expects to get the medal for his superior work, nineteen will be disappointed, and there is trouble in the family.

Again. Where can you get men to act as judges? You could not ask practical photographers and members of the Association to act, as they might be influenced in deciding by friendship and favouritism shown. If thorough photographers are not selected as judges they are not competent to act, as has been seen in the exhibitions at institutes, fairs, &c. In such exhibitions the man making the best show of frames and gaudily dressed sitters usually gets the highest premium, even if his competitors show superior manipulation. Who but the man initiated in the difficult, delicate, mystic art is capable of deciding whether the exhibitor has succeeded in his work and produced these difficult, delicate effects in perfection.

By all means hold conventions. Have your meetings so interesting that the fraternity must attend to keep up with their competitors. Let the meeting be the principal attraction and not the quarrelling over medals, then every man attending will be benefited and must needs come again the next year.

Well do I remember when "Black," of Boston, stood up in our meetings to be catechised by 300 or 400 members, and good friend "Clemens" told the art of albumenising paper, saying how the old hens of Luzerne County laboured to lay eggs enough for his purpose, members sitting with pencil and paper making notes of all they heard. Then information was freely imparted, and I believe many men are to-day good workers because they used the information obtained at those meetings.

Friendship, kindness, goodwill are the watchwords. So mote it be.
—Anthony's Bulletin. A. BOGDARDUS.

RECOLLECTIONS OF PHOTOGRAPHY IN NEW YORK.

[The Reunion of the Photographic Societies of New York.]

I AM well aware that the most successful after-dinner speeches are those that contribute most to the mirthfulness of the occasion; speeches that are crowded with pleasantry and humour, and sparkle like the wine so often drunk at such social gatherings. Now I must confess I am not gifted in this branch of speech making, and therefore can only say a few simple words in response to the toast our President has assigned to me. If, however, what I say shall tend to allay the jealousy or ill-feeling of any professional toward those who practice the art simply for their pleasure, I shall accomplish the main purpose of thus occupying a brief portion of your time. It often affords us pleasure to reflect on the scenes and events of our past life—the school in which we were first taught, the boys who were our playmates, and our first attempts to learn some business or profession in which we hoped to win success in the world. We can now think of the sports and loves of our youth without being angered by the petty cares that were then mingled with them; we can remember the bright hopes we entertained, the fancies we indulged, and the airy castles we built, without regretting that they have never been realised. We can now think of our first efforts in one or more of the various photographic processes that have been introduced in the last fifty years, processes that have so quickly followed each other that before one could be fully developed it must be laid aside for another. We can now think of our struggle in keeping pace with the rapid advances of the art, the difficulties we surmounted, and the disadvantages under which we laboured when we must needs be our own chemists and carpenters and our own teachers of optics and art. We can remember the balky chemicals, the faulty lenses, the cumbersome apparatus, and the inappropriate light and heat in which we were forced to work. We can remember how unsuccessful we often were in overcoming the abnormal action of the chemical compounds with which we had to deal; the perplexities and anxieties we passed through; and how, our imaginations being aroused, we were often led to condemn the chemicals rather than our want of dexterity and skill in the proper management of them.

All these difficulties, together with the thousand and one now forgotten, tended to keep the mind of the photographer in a state of continual suspense, and make his whole life a sea of disappointments, shallows, and uncertainties. All this we now glance back at and feel surprised that we were so perplexed and discomfited; for we can now look upon these failures from a more philosophic standpoint and perceive their uses in the development of the art. We can now see how the pioneers cut a roadway through the forests so that the whole continent of photography might be travelled with certainty and success. There are yet obstacles and difficulties to be overcome, but the brain force enlisted to surmount these is a hundredfold greater than ever before. The facilities for obtaining information by means of books, photographic associations and conventions, must greatly lessen the labour of every student as well as improve the quality of his work. There is no branch of the art now that has not its competent teachers and guide-books, and hence any who may feel disposed can easily become familiar with its secrets and enjoy the thousand delights and uses to which they lead.

Among the earliest impressions of my photographic history are the recollections of my exalted ideas of the honour of being a Daguerreotype

artist. And as I regarded the apparent or seeming simplicity of the art within the reach of my means and ability, I at once embarked in it, in order to win success. Thus in course of time I isolated myself from every other means of making a living, and however willingly I would have parted company with the profession, I could devise no means of accomplishing it without making a sacrifice more unbearable than the business itself.

Being thus cut off from all means of retreat, it was a forced march onward, until good luck so attended my efforts that I was content to bear the ills I had rather than to fly to others that I knew not of. Thus content gradually inspired me with a love for the art that has never waned, and though I now know there is neither much honour nor money to be won in its pursuit, it has a charm that will no doubt hold me "till death do us part."

At a time when there were only some five or six Daguerreotypists in the City of New York, I called on one of the most noted, whose place of business was on Broadway, only a few blocks from my own, and in course of conversation was severely censured by him for giving instruction in the art. His idea was that it should be kept a profound secret, that there were already too many in the business, and that he alone would undertake to make all the Daguerreotypes the city demanded. There is no doubt he could have done this and taken a less number of pictures in a month than is now taken in a single day by some of our leading photographers. In attempting to defend myself as best I could, I endeavoured to convince him that every one we could persuade to learn the business was not only fifty or a hundred dollars in our pockets, but, if they succeeded, their influence and money would tend to multiply the demand for pictures and more rapidly develop the capabilities of the art. I think, however, I failed to convince him of the truth of my philosophy, for he still continues the old cry that there are too many in the business, and that those who are in it are most greatly injured by the amateurs outside. It has never occurred to him that he is indebted to them for the best text-books on photography, for the largest portion of its literature, and for its most ingenious mechanical inventions and chemical compounds.

Every thoughtful photographer cannot fail to perceive that the amateur element, by means of its wealth, culture, and refinement, has added much to the dignity of the art and the volume of its capital. The professional should therefore cease to be envious of the amateur and seek rather to win his favour, for it is only by the union of both that the highest good of all can ever be accomplished.

J. B. GARDNER.

A HOLIDAY AMONG THE TURKS.

[A Communication to the Liverpool Amateur Photographic Association.]

LEAVING England on the 30th March last, my first stoppage was at Passau, which was an enforced stay of eight hours. Passau is on the Austrian frontier. I secured two good general photographs of the town from the Park, which commands a magnificent view of the surrounding country and of the Lesser Danube, which river flows through the town.

I was next brought to a stop at Vienna, as I had, unfortunately, not received my passport before leaving England, and this is an almost necessary article if one wishes to get through Roumania and the neighbouring countries without trouble or molestation. Vienna offers many opportunities to the amateur photographer, being one of the most magnificent cities in Europe. The streets are, as a rule, very wide, and the houses beautifully built. Unfortunately I was running about after my passport almost the whole of my stay. Leaving Vienna we pass through some very fine scenery, and one who has studied instantaneous photography has many opportunities of securing good views of the hilly scenery through which the train passes as you approach Varna. Here I met my friends, and having transferred our luggage to the steamer at Varna we sail to Constantinople.

A slight check bars our further progress at Karak, the entrance of the Bosphorus, as a report has spread that cholera has broken out at Buda-Pesth, through which city most of the travellers have passed. Accordingly we pass a very unpleasant three days in quarantine, with 200 crates of live fowls on our decks. When we are released and have secured our health certificates, for which we have the pleasure of paying half-a-crown each, we sail down the Bosphorus, passing some of the most magnificent scenery in the world, and at length approach, with a good deal of curiosity, the far-famed city of Constantinople and the land of the "unspeakable Turk."

Leaving my camera and its accessories on the ship, I took my personal luggage on shore, and together with some more passengers got my luggage passed for the large sum of one franc. Some days after I brought my camera on shore—but, oh, the trouble! First of all I had to see about seven Custom officers before getting one who would or could attend to my wants, and then they would see the plates I carried, if only the edges! It mattered not so long as they saw they were glass. Having appeased them by taking one out of my changing box, the next thing was the valuation of my goods, as the Turk, with an eye to the interests of his country (?), levies duty on anything not personal luggage. After about five hours all this business was finished—I took the camera on shore only to put it away, as I was thoroughly sick of the whole business. Then I heard that you can take nothing, not even luggage, up the Bosphorus in a row-

boat (or *caigne*) without a police permit, or *cheskerré*, and this added to the general suspiciousness of the Turks takes very much away from the pleasures of photography. When I did take my camera out I only secured a few photographs—one of a Turkish graveyard, which is very picturesque. When the Turk buries a body it is to leave it, uncared for, for evermore. The gravestones are broken and gets scattered about, and no one ever puts the place in order. As most of the lower-class Turks cannot read, they have to carve symbols upon the stones to denote the sex and class of person—i.e., for a boy, the head of the stone is adorned with a fez; a girl, a branch of a tree or a twig; if a married woman with children, fruit is added to the branch. There are also various symbols to distinguish people who could read, or who had been to Mecca. Of course there is always more or less writing added.

The next view is of the towers at Roumelie Hissar. This is an ancient castle, and is the first piece of ground ever occupied by the Turks in Europe. It is said that from the hills on the Asiatic side of the Bosphorus the outline of the towers form the word Allah, which in English means God. Another view I secured was of Bebek, on the Bosphorus (a village which is almost entirely populated by English). I afterwards got one of the Mosque of St. Sofia in the distance, and the last was of the Galata Tower, an ancient building now used as a fire station. In the balcony at the top soldiers are continually pacing, night and day. When they see a fire, lanterns are hoisted (or, in daytime, flags) to denote whether the fire is in the town or on the Bosphorus.

Fires here are very numerous and of very great extent, as all (or nearly all) houses are built of wood, and the fire brigade are of a very primitive character. In one fire I saw there were 660 odd houses destroyed.

The bazaars here are very interesting; they are covered in, and form quite a small town, divided into streets, which have the drains running uncovered down the middle. As soon as you enter you are besieged by all sorts and conditions of guides, and interpreters, and would-be sellers, who speak almost every language under the sun. The best way to get rid of them, I and my friends found out, was to stand quite still and stare them out of countenance. The most stout-hearted never stood it above two minutes. Also, when buying goods, never pay their price, or they will account you a fool; offer them half the amount they ask, and as a rule you will secure the article you want. Don't show your money or purse if you want a reduction. Dogs here are also a great feature (although hydrophobis is almost unknown), and are the scavengers of the city. Each street has its colony, and if a dog comes out of his own street he has, as a rule, a bad time of it.

Leaving Constantinople, we sail down the Dardanelles on a most beautiful day, and are able to admire all the magnificent scenery offered to view. We arrive at Smyrna, to find that there is nothing at all to see in the town. The only thing to do is to secure mules and to ride out in the country. The first place of interest is the Seventh Church of Smyrna. The place and church take their name from the fact that it was about here St. Paul built one of the seven churches mentioned in the Bible. Securing a photograph of this and the aqueduct which supplies the town with water, we move on to Mount Pagus. This is a very high hill, and commands a splendid view of the town and the Bay of Smyrna and the surrounding country. On the right you can see Bournabad, an outlying district four miles from Smyrna, and the place where the three Englishmen were a few days ago captured by brigands. The castle (which the Turks are destroying by degrees) where we are now standing used to contain the old town of Smyrna, and was most strongly built. Securing several photographs of the castle and the fallen towers, and after taking a group of our party, we descend a most fearfully rough path on our return to the town. The way the mules run across gullies and rocks is marvellous, but they are accustomed to it, and barring an occasional upset they do their work nobly. One or two of them rather like sitting down in the middle of the road without warning you that they want to sit.

Our next excursion was by rail to Ephesus, one of the historical cities of the Bible. A day amongst the ruins of Ephesus does one more good than a dozen of the longest and driest sermons ever written. To look upon such ruins and to think that it was once one of the largest cities of the world, inspires one with awe and wonder. All the buildings were of marble, and the ground is literally strewn with lumps of brilliant marble and fallen pillars. There is nothing of the original town standing. I secure a photograph of the old Roman aqueduct before we mount our horses and move on. We first see the Roman Gymnasium, and then come upon what is shown as the grave of St. Luke. This was discovered by Mr. Wood, the great excavator, and is recognisable by the carved bull and cross which he says was the symbol of St. Luke. Next we see a font, which was used by St. John the Baptist. It is of marble, and is six or seven feet in diameter, and is carved out somewhat in the shape of a shallow basin. Here we dismount to secure some negatives of the fallen ruins, selecting some capitals and pillars most exquisitely carved as a subject.

Moving on (as time is very limited), we pass some underground passages, which we have no time to explore, and come, after a good mile's ride, to the ruins of the Temple of Diana, one of the seven wonders of the world. There is simply nothing of this glorious building left but the stone foundations. Curiously enough this is almost the only stone one sees at Ephesus, but, of course, the temple when standing must have been all of marble; but it is a known fact that all its pillars have been carried away to beautify such places as the Mosque of St. Sofia, and, to

speak more generally, Athens and Rome. Leaving this spot we demolish a substantial dinner which has been provided at the hotel, and proceed to inspect an old mosque—of later date than Ephesus itself. The mosque contains nothing interesting but an immense red granite pillar which has come from the Temple of Diana. This pillar is about twenty feet high, and took three people to span round the base. Sights of this kind suggest several thoughts; where did the granite pillar come from? and what could our architects of to-day teach the ancients about the science of building? After this we have to hurry back to Asstralouk Station to return to Smyrna, after spending here a most interesting and instructive day.

One word about brigands. Never go unless you are a large party—an armed cavass, or escort, is provided, but still he is not an army in himself, and the brigands are naturally a bold, bad lot. A few weeks after we were there the passengers of an English ship were standing on Asstralouk Station when a brigand chief was captured in their midst. He was headless three days after.

The next day we left Smyrna for England, and only had three hours to spend in Malta, and Gibraltar we passed at six in the morning before the sun had risen. This gave no fair chance of a photograph.

I would like to give a few hints about the sort of camera to take in case any one thinks of travelling over the same ground. I was troubled with a whole-plate. Take a pocket-detective camera and use lantern-sized plates, and enlarge at home. If possible, use paper plates; also, I would advise the wearing of a coat somewhat after the style of that used by poachers. Then by putting your camera and all accessories in the pockets you would escape the troublesome Customs examination, and much consequent expense. Of course you would have to be careful to raise no suspicion by the bulkiness of your pockets, but by careful packing that could be easily avoided.

W. B. IRVIN.

NOTES FROM ABROAD.

(From our Special Correspondent.)

I.

LIEGE, Tuesday.

Now that there is some prospect of a general International Congress of Photographers at the Paris Exhibition in 1889, and that there is a growing desire among English photographers to mix more with their brethren on the Continent, perhaps some practical information about travelling and life upon this side of the Channel may be useful. To this end it may be desirable to deal with the ascertained difficulties in the way of travelling abroad which one hears most frequently mentioned in London, namely, sea-sickness, language, Custom House barriers, and expense, some of which impediments are, to a large extent, imaginary.

Within easy distance of London, from which, indeed, Calais or Boulogne-sur-Mer may be reached in from three to three and a half hours, are the shores of France, Belgium, and Holland, and of these, for photographers out for a holiday, Belgium decidedly presents most attractions within small distance from home. The Dutch language and the flat landscapes of the country are not likely to be particularly attractive to the photographic pleasure-seeker. Railway travelling is more expensive and the distances longer in France than in Belgium, and the more striking scenery of France is usually near its borders; in the interior there is frequently great sameness of scenery for hundreds of miles at a stretch; it is a rich, undulating country, flowing with milk and honey, and inhabited by a lively and refined people. Of architectural subjects for the camera it has rich store, but usually, except in the larger cities, scattered long distances apart. At a French seaside resort the photographer is better off than when spending a few weeks on the English coast, because the change is more thorough, the foreign manners and customs are new, the rock-bound coast is more picturesque, with cliffs not usually of chalk, and there are fine opportunities of photographing sunsets at sea. At English watering-places near London the sun sets inland. On the nearest parts of the French coast, however, the tourist is far from any French photographic society, or centre of photographic industry, of which, doubtless, he would like to see something while in the country. Rouen is the nearest place in which he would be likely to experience much gratification of the latter kind. The little town of Douai, with its photographic society, is, indeed, not so very far from Boulogne, but is more advantageously reached through Belgium. By starting from Antwerp the societies at the following places may be readily visited ones after the other:—Antwerp, Brussels, Ghent, Douai.

The supposed difficulties with Custom House people are imaginary; a more civil and obliging set of men never drew breath, and baggage is overhauled twenty times more completely on the English side of the Channel than anywhere else; perhaps the search for dynamite may be the explanation. That which most approaches the English overhauling is not likely to be encountered until the boundary line between Switzerland and Italy is to be passed, say at Chiasso; even there, if the passenger has evidently come through from England, or some other distant country, he is not likely to be much troubled, and in any case will experience no incivility. The fact is that the frontiers of these two countries form a great smuggling district, keeping the Italian officials at their wits' ends to impede the illegitimate flow of tobacco, salt, and jewellery over the border. Over mountains and down precipices at uncertain times of the day and night flow the contraband articles;

workmen carry them concealed in loaves of bread intended apparently for their innocent dinners, carrier pigeons fly with them overhead, and it remains only to train the fishes in the rivers to establish a subaqueous traffic. All this would try the patience of a saint, and a saint the hot-tempered Italian is not. The Italian Government complains grievously, but the Swiss reply that it is not their duty to do Customs work for their neighbours, and that the better plan would be for the Italians to reduce their tariff so as to make smuggling less profitable; thus the situation is somewhat strained, and the quarrel is a pretty one as it stands. Once when I crossed the boundary in a steamboat on the Lago Maggiore my baggage was not examined by the Italian Custom House officer on board; he doubtless knew the difference between the English tourist and the local gentry, who needed more of his attention. When the French examine baggage, much of the work is often done out of the view of the possessor in rooms devoted to the purpose; they demand his keys, and he does not know to what extent his worldly goods are overhauled. They do not usually trouble themselves to examine small bags and parcels. It has been suggested that you may tell them to be careful in handling your belongings because you have but just recovered from the small-pox; any one who tries this plan had better report in these pages how it works. Some immoral people have suggested bribing the officials to get large quantities of luggage through rapidly; any one who attempts this with a German Custom House officer is liable to punishment by law.

Come we now to the question of sea-sickness; as a rule it is good for the liver, and the voyager is better in health afterwards. Some persons, however, with exceptional constitutions, suffer long afterwards; others, again, are never sea-sick at all. Cows are included in the latter category, their insides being so constructed that they cannot be sea-sick, but they suffer greatly. Cats and dogs are sometimes sea-sick. There is, perhaps, no actual preventative, although every one is ready to offer a safeguard to his neighbour. A man who takes an aperient draught three days before starting, and takes care to get himself into good condition, is better fitted to resist sea-sickness than one who has not done so. Suppose the water to be rough, the best thing the traveller can do is to lie down and wrap himself up before the ship leaves the port; place a basin handy, and do not get up until the ship reaches the other side of the Channel; this is the almost invariable plan with old stagers liable to the malady—when one gets too sick to be able to walk with ease, it is not at all easy to move about and to settle down comfortably. The best way of all of crossing the Channel is to go to Folkestone or Dover, and if the sea be rough wait one or two days till it is quite smooth; then cross it, and thereby cheat it of its prey and the fishes of their dinner.

A common error exists in the belief that the shorter sea passages reduce the evils of sea-sickness to a minimum; but upon arrival at the opposite coast, and being told to take up your bed and walk when you are in the throes of dissolution, you feel that the stern authorities might leave you to rest in your misery, and not force you to get up and crawl into an adjacent train; but the ship has to leave the quay, and the fates are inexorable. Upon the shorter routes the harbours are shallow on both sides, especially those upon the French coast, hence but small boats can be used, and these pitch and roll more than large ones. Then again, conflicting currents meet in the narrow parts of the Channel and tend to keep the waves in a general state of pitch and toss, so that occasionally people suffer more on this short trip than on a voyage upon the long Atlantic rollers to New York. On the other hand, if one of the longer routes with large boats be selected, say that by Southampton and Havre, or Harwich and Antwerp, you reach the ship at night just in time to go to bed, can stow yourself away comfortably, and if you are sick have it out in peace and quietness, then go to sleep for the rest of the night rocked on the cradle of the deep, and sweetly losing consciousness while listening to the lullaby of the waves. The deep-sea boats not only toss about less than the others, and in a general way have smoother water than off Dover, but off Harwich the sea has an exceptional tendency to keep smooth, the generally prevailing winds of the south of England being from the south-west, and from these by the route just stated the land affords shelter. In foggy weather the ships have to drop anchor in the Scheldt until it clears, river navigation in a fog being impracticable, hence, in November, there is the possibility of delay by this route; but the passengers have what the Americans call a "high old time" of it so long as the provisions last.

Although I am unaware of any drugs which prevent sea-sickness, there are mechanical means for almost entirely preventing it, but too expensive for general adoption in steamships because of the space occupied by the apparatus. Once it was my duty as the correspondent of an engineering journal to practically test some apparatus of this kind invented by a Belgian, and fitted up by the South-Eastern Railway Company upon one of their finest boats, the "Princess Alexandra." On approaching Folkestone I saw the sea white with foam, and in a particularly nasty condition for passengers liable to sea-sickness. The apparatus consisted of a couch, such as might be used in a drawing-room, slung to a ball and socket joint high above it, so as to be virtually a pendulum. The efficacy of the apparatus depended upon the considerable length of this pendulum. The whole arrangement was furthermore mounted upon a large square bellows, so devised that when the vessel pitched the ball and socket joint did not rise and fall to the same extent as the ship. On board this couch the appearance of the saloon and the other passengers was extraordinary; they and the sides of the

ship rose above and sank below me with the rolling of the vessel. I felt no symptoms of sea-sickness until the entrance to Boulogne Harbour was reached, when qualmish symptoms began. Soon afterwards I landed and walked quietly away, none the worse for the voyage; but as regards the rest of the unfortunate passengers, I never saw worse or more universal cases of sea-sickness.

THE BOMBAY AMATEUR PHOTOGRAPHIC EXHIBITION.

At the *conversazione* which preceded the opening of this Exhibition, Dr. Wellington Gray, the President of the Bombay Amateur Photographic Society, asked for the indulgence of the spectators in judging the pictures. The work of the amateur votary of any art is always considered a subject rather for encouragement than for censure; and the critic who would frown upon any shortcomings he may detect in the work of a professional, who has made a particular calling the business of his life, relaxes the standard of his judgment a great deal in favour of the man who follows an art as a pleasure and a recreation. When there are so many as three hundred exhibits, and all of them by amateurs, it goes without saying that some of them should be of very indifferent merit. But we do not think it will be denied that the general standard of excellence is high; and the value of whatever commendation that may be bestowed on that account is heightened by the fact that the Society which has organized the Exhibition, the first of its kind in India, is not yet a year old. The Committee had to select the exhibits from a very large number of aspirants to a place on the walls, and it is due to their judicious labours in the cause of the survival of the fittest that we find here an entire absence of specimens executed by the merest tyro. The Society numbers about sixty members at present; but we should not be surprised if one result of this Exhibition were to draw many recruits to its ranks. For there are many pictures exhibited here which may serve to bring home to one's mind the pleasures of photography. Numerous improvements have from time to time been introduced in photography, and while the beginner in these days has the good fortune to learn the art at a time when it has already reached an advanced state of perfection, he may hope to see before very long still more noteworthy improvements. Colour photography, for instance, may be said to be still a thing of the future. Many have applied their minds to discover the process, and the man who succeeds in making this discovery will certainly mark an era in the progress of this art.

The judges awarded the gold medal to Mr. George Ewing, a member of the Photographic Society of India. Dr. Wellington Gray carried off the silver medal. The other medals were awarded to Mr. E. Ferrers Nicholson and Mr. H. Bromley.

The Exhibition was a great success.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 13,762.—"Improvements in the Application of Photography to Silk, Satin, Cotton, and other Similar Fabrics." J. B. CUMING and W. WILLS.—*Dated October 11, 1887.*

No. 13,804.—"Improvements in Photographic Cameras." A. BILSON.—*Dated October 12, 1887.*

No. 13,879.—"Improvements in or connected with Photographic Cameras." E. V. SWINDEN and J. EARP.—*Dated October 13, 1887.*

No. 13,886.—"An Improved Mount for Photographs." W. D. WILKINSON and F. FOWLER, trading as W. Dyke Wilkinson & Co.—*Dated October 13, 1887.*

No. 13,999.—"Photographic Photometer." J. STURROCK.—*Dated October 15, 1887.*

PATENTS COMPLETED

A NEW OR IMPROVED COMBINED PHOTOGRAPHIC CAMERA AND PHOTOGRAPHIC ENLARGING LANTERN AND MAGIC LANTERN.

No. 15,187. WALTER PHILIP O'REILLY, 399, Edgware-road, Middlesex.—*November 22, 1886.*

The object of my invention is to produce in one and the same apparatus a photographic camera, a photographic enlarging lantern, and a magic lantern.

According to my invention I make the bellows in such manner that it can be fitted and removed from the camera as required; for this purpose I provide a frame at each end of the bellows, such frame fitting into the two camera ends in grooves there provided for the purpose; when the frames are removed the bellows can be folded into a compact space. The inner surface of the camera is lined with tin plate or other suitable material, japanned or blackened, and when the apparatus is to be used as a magic lantern, a metal vessel, say a tin vessel, which may be made, for the sake of portability, in sections, is substituted for the bellows of the camera, having the necessary apertures formed in same for the chimney and for attaching same to the frame. The metal body fits into the grooves or spaces previously occupied by the bellows. The tin back and reflector is also inserted in the groove previously occupied by the dark slide. The conical front and slide holder are connected in any convenient manner to the camera front, which may be conveniently accomplished by placing on the camera front two screw heads or buttons at top and bottom thereof, and in such manner that the slide holder and conical tube containing the magic lantern can be, with the greatest facility, slipped over or removed from the screw heads or buttons. The tube of the camera lens is of large

enough diameter to contain the condenser for the magic lantern or photographic enlarging apparatus, and the lenses used for the condenser are separated and used separately for the camera.

The whole apparatus is fitted on a base, or stand, with means for adjustment provided, and to enable the camera to be placed in a vertical or horizontal position. This base, or stand, is available as a stand for the camera or magic lantern as may be required. The lamp for the lantern is carried, supported, and adjustable, in the well of the baseboard, and in this way the lantern is not so heated as is generally the case now when placed inside.

IMPROVEMENTS IN APPARATUS FOR PRINTING PHOTOGRAPHIC PICTURES.

(A Communication to me from abroad by Hans Brand, of Baireuth, in the Empire of Germany, Photographer to the Court of Bavaria.)

No. 16,012. EDMUND EDWARDS, 35, Southampton-buildings, Chancery-lane, Middlesex.—*December 7, 1886.*

This invention relates to apparatus for the rapid printing of photographic pictures upon paper, or other surfaces, rendered sensitive to light by bromide of silver and gelatine, or other means.

The improved apparatus is not intended for the reproduction of pictures by any of the known mechanical printing processes, but for the rapid and perfect production of positive prints of any dimensions upon highly sensitive material, where it is of importance that the exposure should be accurately timed, and all extraneous rays of light excluded.

The improved apparatus consists of a frame taking the place of one of the panes of an ordinary window, the remainder of which is darkened with some non-actinic material. Into this frame are fitted two hinged shutters, one opening outward, and the other inward into the dark chamber. The latter turns upon hinges at the bottom, and is held by a catch or bar at the top when closed. It has a central opening also, closed by a shutter hinged below, which carries the sensitive material upon which the picture is to be printed, and is covered with a non-actinic cloth. The shutter opening outward as well as that last described are held when closed by a double catch at the top of the outer frame, turning upon a pivot and held in its normal position by springs. At the lower side of the outer frame, which opens inward as described, is fixed a bracket carrying a spring, upon which the inner shutter carrying the sensitive surface falls when open.

The inner side of this last shutter carries a flat plate, or support, resting upon springs between them, and covered with a sufficient number of thicknesses of soft elastic material, such as velvet or plush, upon which the sensitised paper is laid, and held in its position by a thread carried by side wires or fastenings.

In the principal frame fitted into the window, as first described, is fitted a plate glass, across which are arranged two adjustable bars sliding at their ends in vertical grooves, in which they can be fixed in any position by screws. These bars hold the photographic negative.

To use the apparatus, the operator closes the shutter which opens outward by means of a wire, or bar and handle, passing through a light-tight opening, until the top of the shutter frame is held closed by the outer end of the top catch; the negative is then fixed in its place against the plate glass by the two adjustable bars, and the sensitised paper is adjusted in its position upon the elastic bed prepared for it. The latter is then raised until closed, when it is held by the inner end of the top catch, the outer end of which at the same time releases the outer shutter, which falls outward. When the exposure has been sufficiently long, the outer shutter is closed by the handle, and in becoming locked by the top catch it releases the inner shutter and sensitised paper, which fall inward, when the print can be removed and a fresh sheet of sensitised material adjusted in position, and so on as often as desired.

IMPROVEMENTS IN DARK SLIDES FOR CAMERAS FOR PHOTOGRAPHIC PURPOSES.

No. 1637. GEORGE WILLIAM ELLIOTT, 12, Clarkehouse-road, Sheffield, Yorkshire.—*February 2, 1887.*

This invention has for its object the construction of dark slides for cameras for photographic purposes, so as greatly to reduce the cost of production, and also make them less bulky and more portable.

Dark slides for cameras has hitherto been made of wood or cardboard. Those made of cardboard being practically useless, and the use of wood rendering the others very costly, on account of the labour necessary for their construction, and bulky, on account of the thickness required to give the necessary strength for working.

These defects are obviated by this invention, which consists of constructing them of metallic sheets, or sheets of vulcanised fibre, vulcanite, or other suitable material capable of being folded, creased, stamped, or pressed into the required shape.

A piece of sheet tin or other suitable material of the required size is so stamped, or pressed, or folded on its edge as to form a groove for the sliding door or shutter, and at the same time be perfectly light-tight and of sufficient depth to allow of the sensitive plate being placed between the back of the slide and the sliding door.

Two of these pieces are placed at the required distance apart, according to the size of the slide or plate to be used, and are joined together by the piece forming the back of the slide.

The ends are made light-tight by the insertion of suitable material, such as cloth, bearing against the inside of the sliding door or shutter, or by being folded over in a similar manner to the sides. The whole slide, excepting the sliding door or shutter may be made of one piece stamped or pressed into shape, or may be any combination of pieces to suit the convenience of manufacture.

The sliding door or shutter has its two outside edges folded so as to work in the folds formed in the body part, the whole forming a level or flush surface and a perfectly light-tight joint.

A portion of the back is indented so as to bear against the sensitive plate, and, by means of the spring of the back plate, hold the sensitive plate in its position.

The folds forming the guides for the sliding door or shutter may be such that the slide may not require folding on its edges which work in these guides but be kept plain.

The claim is for making dark slides for cameras for photographic purposes of metallic sheets or other suitable material capable of being folded, creased, stamped, or pressed, and so folded, creased, stamped, or pressed into the required form to render a light-tight sliding joint, with the sliding shutter and its slides, substantially as described and illustrated herein.

[What says Mr. W. Tyler to this?—EDS.]

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
October 25	Great Britain (Technical).....	5A, Pall Mall East.
" 25	Bolton Club	The Studio, Chancery-lane, Bolton.
" 26	Burnley and District	
" 26	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 27	Burton-on-Trent	
" 27	Liverpool Amateur	Royal Institution, Colquitt-street.
" 27	Oldham	The Lyceum, Oldham.
" 27	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, October 13, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. C. Heinrich Trinks presided.

Mr. L. Medland exhibited photographs he had taken recently in Russia and other parts of Northern Europe.

The CHAIRMAN exhibited a photo-micrograph of *Amphipleura*; the specimen had been mounted in phosphorus and photographed by the aid of a one-twelfth oil immersion. In such work, he said, it is often necessary to have absolute coincidence of position of the ground-glass and the sensitive plate. The simplest plan is to put the ground-glass first into the dark slide and to focus upon it, then focus upon plain glass with a few diamond scratches upon it, and, lastly, to substitute the sensitive plate.

Mr. J. J. BRIGNSHAW had made a good focussing screen by letting a slight flash of light from a paraffin lamp flame fall upon an ordinary sensitive plate, then developing and fixing the plate, and, lastly, steeping it in bichloride of mercury.

Mr. A. HADDON had found oiled finely ground glass to answer well.

The CHAIRMAN stated that in photo-micrography errors are often introduced by the action of change of temperature upon the spring of the fine adjustment screw of the microscope; the remedy is to remove the spring altogether.

The HON. SECRETARY had known alteration of the temperature of the stage of the microscope by a lamp six or eight inches off to throw objects out of focus.

The CHAIRMAN had tried the Welsbach light and found it to be rich in actinic rays. He had begun some experiments to take instantaneous photographs in the microscope, using "Henderson's thunder and lightning plates," and had found that the instantaneous shutter must be so mounted that it had no connexion with the microscope. He used a screen of yellow glass, so that he could watch the movements of living objects as projected upon the sensitive plate, and could make the exposure when they were in the best position to give an interesting picture. He focussed upon opal glass.

Mr. A. COWAN said that it was impossible to focus well upon opal glass.

Mr. HADDON remarked that Janssen and other astronomers focussed upon a screen coated with plaster of Paris; there was nothing better. He thought that with the screen of yellow glass there was a chance of fogging the plate, and that by means of a right-angled prism fixed to the bottom of the shutter, and falling with it, the movements of living things could be watched upon a screen at one side of the whole arrangement, and the shutter allowed to fall when the objects were in a good position for photographing.

The CHAIRMAN thought the suggestion to be excellent.

Mr. PLUMER wondered whether a binocular microscope could be used, the object being watched through one of the tubes, and photographed through the other at the selected moment.

Mr. COWAN called attention to the sale catalogue of Mr. Stevens, in which one of the lots was advertised as an "8x8 bellows cabinet lens, by Ross;" he should like to see that remarkable lens.

Mr. COLLINS exhibited a detective camera to which he had applied a roller slide.

Mr. A. L. HENDERSON wished that some one would manufacture an aluminium camera and slides, as patented long ago by Mr. Melhuish; aluminium could now be made, he believed, very cheaply.

Mr. F. W. COX could not account for an insensitive band about a quarter of an inch broad round a batch of plates he had bought.

Mr. COWAN said that they had been coated with imperfectly-washed emulsion.

Mr. HADDON had once tested by a tuning-fork arrangement a shutter said by its maker to give an exposure of one-one-hundred-and-twenty-fifth of a second; he found the real exposure to be one-twenty-eighth of a second.

CAMERA CLUB.

THE paper read at the "Thursday evening," October 13, was by Mr. LYONEL CLARK, and was entitled *The Selection of Lenses*. Mr. Francis Cobb occupied the chair.

Between forty and fifty members and visitors came together to hear and discuss the subject, which the lecturer illustrated by diagrams and by a complete series of lenses.

Previous to the paper being read the CHAIRMAN gave particulars, as far as agreed upon, of the date of the second Conference, proposed to be held by the Club in the spring of 1888.

Mr. H. C. Bond exhibited some very interesting old photographs and negatives, Talbotypes of the first Exhibition in 1851; and Mr. Sage handed round an example of the ingenious little watch detective camera of Lancaster.

The CHAIRMAN then called on Mr. Clerk for his lecture.

The lecturer followed out the laws of perspective that guide us in the selection of a picture, showing how lenses simply delineated what they saw. He pointed out the most suitable focal lengths for the different sizes of plates usually in use, and also spoke on the subject of the best form of lens to employ, whether for views, architecture, interiors, portraits, enlarging, or lantern work. He gave a few words of advice as to rules to be observed in choosing lenses, and recommended great care when the lenses had been bought. A large collection of different types of lenses were shown.

In the discussion which followed, Mr. J. TRAILL TAYLOR made some remarks upon flare spots and upon several types of lenses, and said he had not much fear of the iris diaphragm of Messrs. Beck wearing so as to give flare, and even if it did it could easily be blackened again.

Dr. LINDSAY JOHNSON thought the best black for the purpose of blackening the edges of the apertures of stops worn bright was gasblack. His favourite lens for all landscape work was the portable symmetrical.

Mr. TAYLOR said lampblack, which was often used with varnish, gave a grey colour when dry; the best to use was vegetable black mixed with lacquer. These used in proper proportions gave the most diabolical black conceivable.

Mr. CHAMBERS referred to the ordinary uses of the rapid rectilinear and the wide-angle lenses, and gave some particulars also concerning the triple achromatic lens.

Mr. BECK said the iris diaphragm had stood the test of long usage in microscopic work. He considered it a great objection to gasblack that it rubbed off easily.

Mr. SPIERS said one class of lens had been omitted, the pinhole lens. He had brought down two of his own manufacture, with prints from negatives taken by them. (The examples handed round were soft and pleasing pictures, views in the Netherlands.)

Mr. SARGENT wished to ask whether, if a wide-angle lens was used upon a plate of much smaller size than it was intended to cover, the excess of light in the camera tended to fog the plate.

Further questions were then put by Mr. DAVISON, and Mr. CLARK then replied along the whole line.

In conclusion, the CHAIRMAN moved a vote of thanks to Mr. Clark, and said he was sure that the paper and the discussion upon it that evening showed that their functions were extending far beyond those of an ordinary club, and that they would have to add to their title "Institute of Amateur Photographers," to signify the aims and intentions of the Camera Club, as being those of a scientific society in addition to its social objects.

On Thursday, October 27, Dr. G. Lindsay Johnson will read a paper entitled *Testing Lenses*. Practical demonstrations will also be given, the apparatus for testing the lenses being arranged beforehand in the Club.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE ordinary meeting of the above was held in the Free Public Library on Thursday evening, the 13th instant.—The President, Mr. J. A. Forrest, in the chair.

Messrs. J. W. Simpson and E. M. Tunstall were elected members.

The President laid on the table a catalogue of books pertaining to photography, which had been compiled expressly for the Association by Mr. May, the Librarian of the Free Public Library. It was hoped that members would avail themselves extensively of the opportunity thus afforded them, many of the works being standard ones by recognised authorities on the art.

A lantern slide competition then took place. The offer of one of the Association's medals acting as a powerful incentive, a large number of members competed for the coveted prize. The work shown was of an unusually high order, and rendered the position of the Judges (Messrs. Phillips, Sayce, and Whalley) anything but a sinecure. When the slides had all been passed through the lantern they announced that those bearing the word "Kingston" were, in their opinion, entitled to the prize. On the sealed envelope bearing a similar mark being opened it was found that Mr. Paul Lange was the winner, the result being received with general applause.

In answer to a question, Mr. LANGE stated that he had used the Kingston lantern plate with soda developer; he had found them more expeditious than chloride ones when reducing from large negatives through the camera, a consideration when using daylight in the winter months.

The Judges regretted that the Association was only offering one medal, as they thought the slides of another exhibitor (Mr. John H. Day) were well entitled to a second prize.

The recognition of this gentleman's slides seems to confute a popular idea among photographers and dealers, that chloride plates will not keep for any length of time (hence, probably, the difficulty which frequently arises of procuring lantern plates during the summer), as it was understood that Mr. Day had used plates he had had in stock since last winter. He stated that he had found keeping to make them rather slower in sensitiveness than when freshly made, but as illustrated by his exhibit they showed no lack of vigour, and were unusually bright and sparkling.

The remainder of the evening was devoted to a further exhibition of members' slides, which lasted until a late hour.

Votes of thanks terminated the proceedings.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

AT the meeting on the 21st ultimo, the President, Mr. T. Davey, in the chair, Mr. W. C. Hemmons was elected a member.

The CHAIRMAN read a letter received from the Hon. Secretary, asking the

Association to accept his resignation, as, in consequence of business and private engagements, he would be unable to devote sufficient time to the affairs of the Association. He proposed a vote of thanks to Mr. Daniel for his services, and that a letter should be sent him expressing the regret which the members felt at his resignation, remarking that Mr. Daniel had been Hon. Secretary for eleven years, and had worked hard to make the Association a success. This was carried unanimously.

Mr. E. Brightman was proposed as Hon. Secretary, and carried unanimously. Mr. BRIGHTMAN said that, as one of the oldest members, he felt great interest in the Association, and that no effort should be wanting on his part to contribute to its continued success. In accepting the office he would be filling the post both of Hon. Secretary and Treasurer, but would be glad if some other member would take over the duties of Treasurer.

After some discussion it was decided that Mr. Brightman should still continue to act as Treasurer to the Association.

DERBY PHOTOGRAPHIC SOCIETY.

The annual meeting of this Society was held on Tuesday, October 11, at eight p.m., in Sykes's Restaurant, Victoria-street.—Mr. J. C. Merry presiding.

The HON. SECRETARY read the annual report and balance sheet, which showed the Society to be in a flourishing condition, it now numbering 101 members, of whom 79 had paid their subscriptions, and the balance lying to the credit of the Society at Messrs. Crompton & Evans's Bank had increased from *£*1. 15s. 7½d. to *£*13. 13s. 1d., and there were no outstanding debts. During the year a number of papers had been read and demonstrations given by the members, and great benefit had been derived therefrom. Outdoor meetings had been held during the summer months at Dale Abbey, Marketon, Stanton Harold and Calko Abbey, Cromford and Matlock, Monsal Dale and Cressbrook Dale, Haddon Hall, Wingfield Manor, Alton, and Weston-on-Trent, and were well attended by the members. The Society instituted a competition for the best picture taken at these outdoor meetings, to be decided by vote of the members. The pictures were arranged round the room that night for decision, which resulted as follows:—First certificate to Mr. C. Bourdin for a view on Lovers' Walks, Matlock, printed in platinotype; second and third certificates to Mr. T. Scotton for view at Marketon, printed in platinotype, and silver print of "Hermit's Cave," at Dale Abbey, respectively. The competition was a keen one between Mr. Bourdin and Mr. Scotton for the first certificate, the former obtaining it by one vote. The Society will print the best picture and present each member with a copy.

Votes of thanks were passed to the retiring officers and to the publishers of the *Photographic News* and THE BRITISH JOURNAL OF PHOTOGRAPHY for sending weekly copies of their papers.

The following officers were elected:—*President*: Captain W. de W. Abney, R.E.—*Vice-Presidents*: Messrs. R. Keene, J. C. Merry, J. W. Price, and T. Scotton.—*Committee*: Messrs. C. Bourdin, H. Bennett, T. Hills, W. G. Haslam, and C. B. Keene.—*Hon. Secretary and Treasurer*: Mr. E. J. Lovejoy, 73, Grove-street.

The question box contained the following queries:—

"Will any member give the best mode of developing and the best developer to use?"

Left over till next meeting.

"Will any member give his experience in using different amounts of water in his developer?"

It was thought if one got a good developer and was used to it he should use no other; and the CHAIRMAN suggested that if a member take a plate, expose it, cut it into several pieces, and develop with different amounts of water in his developer, and compare the results, he would learn more by wasting one plate than by any information that could be given.

"What is the action of the developer upon an exposed gelatine emulsion plate?"

Mr. LOVEJOY (Secretary) replied that the developer continued the action set up by light and developed the latent image.

"Must the bromide in an emulsion be in excess of the silver salt or not?"

The CHAIRMAN said the proper proportions of the salts would be found in one of the annuals, but he should like to remark that if you do not get sufficient bromide in the emulsion the silver is lost, and it is the opposite if you get an excess of bromide.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The annual autumn Exhibition of this Society was held in the large dining room of the Technical Schools, Bridge-street, on Thursday, the 13th instant.

There was a crowded attendance, which proved the great interest shown in the Exhibition by the members and their friends, and impressed upon the Council the necessity of providing larger rooms and much more space for next year.

The number of pictures shown exceeded four hundred, including one hundred and sixty which had been sent in for competition by twenty-eight members. These had been previously judged by three gentlemen (professionals), viz., Messrs. John Collier and Harold Baker, photographers, and Mr. Walter Breeden, an artist, who had kindly undertaken the critical selection.

The prize winners were as follows:—Class B, "Home portraiture," "Mitis;" Class C, "Best instantaneous picture," "Nemo;" Class D, "Best landscape taken during 1887," "Through the Wood;" Class E, "Best picture from stripping films," "One of the Crowd;" Class F, "Best contact print by development," "Platinum;" Class G, "Best enlargement," "Family Pet;" Class H, "Best transparency," "Slow and Sure."

On the envelopes containing the names of the owners of the different mottoes being opened, it was found the winner in Class B was E. Underwood, for his picture of *A Girl Reading*. Evidently the prize was awarded in this instance on account of the graceful pose of the figure, there being other equally good pictures from a photographic student's point of view, but lacking the pleasing position of this one. Honourable mention was awarded to "Amateur" (Thomas Taylor), for *No Partings Yonder*; "Nemo" (W. J. Harrison), for *Surrounded*; "Platinum" (Dr. Huxley), for *Children and Toy Cart*.

In Class C the prize was gained by W. J. Harrison for *Leapfrog*, the subject being boys playing at the game. The sharpness of the principal object is remarkable considering the short period of exposure. *A Waterfall in Norway* (E. H. Jaques) was commended; but whereas the photographer may take his

time over the production of a perfect picture of a waterfall, a game like leapfrog gives fewer opportunities, and demands a promptness of decision for the right moment of exposure. Honourable mention was also awarded for *A Steamer at Sea* (E. H. Jaques) and *Going for a Sail* (W. J. Harrison).

In Class D the prize was gained by W. D. Welford for his *In Brambly Wildernesses*, a picture well worthy of its success in every respect. Honourable mention was awarded for *Broome Village* (E. C. Middleton), *A Warwickshire Lane* (W. D. Welford), *Mapledurham Lock, on the Thames* (J. H. Pickard), *At Ditchingham-on-Dart* (A. Pumphrey), *Broome* (A. R. Longmore), and *Chiddingstone, Kent* (J. C. Huxley).

In Class E the prize was taken by F. Dutton for a very good bromide print from an Eastman film negative (*Warwick Castle*), exhibiting great choice in the selection of subjects and careful manipulation. *Getting Loats over the Weir* (W. D. Welford) was commended.

In Class F, for "The best contact print by development," *Chiddingstone, Kent* (Dr. J. C. Huxley), gained the prize. It was a fine sepia platinotype which showed all the qualities of a high-class steel engraving. Honourable mention was awarded to *Boulders and Ferns* (A. Constantine), *Chiddingstone* (J. C. Huxley), and *Cottage at Charlwood* (R. G. Evered).

Class G was not a successful one, the exhibits being few, no doubt owing to the fact that this class of work (enlargements) is generally done later in the winter months. The Judges suggested that in future the original negative should accompany the picture shown. In this class *Family Pet* (James P. Heaton) took the prize, and *The Steamer "Bonnie Princess"* (F. Hoskins), an instantaneous subject, was commended.

In Class H Mr. Heaton took the prize again for his transparency, *An Avenue on the Warwick Road*. Honourable mention was awarded to *Doredale* (J. H. Pickard), *Cottages at Thorpe* (E. C. Middleton), *Boys Swinging on Gate* (W. D. Welford), and *Fishing* (W. D. Welford).

Class A.—The prize in this class was given by Mr. W. J. Harrison (Vice-President) for the best photograph in the set of prize pictures B to H, to be voted for by the members. It was gained by Dr. Huxley for his picture in Class F, and received twenty-three votes in excess of any of the others.

A large number of pictures were lent for exhibition, including some very fine carbon enlargements by Mr. Harold Baker, and excellent and large platinotypes of notabilities by Mr. John Collier.

The Exhibition was in every way a great success. Votes of thanks were given to the donors of the valuable prizes (Messrs. Harrison, Huxley, Hulme, Hiff, Jaques, Pickard, Place, Rooke, and Taylor), to the Judges, to the Committee, and to Mrs. Pickard for presenting the prizes.

During the evening the HON. SECRETARY read a letter from Mr. John Collier, offering a prize for competition next year among the members for the best photograph illustrating a subject to be selected at the commencement of next season, and suggesting "All's well that ends well," or the word "Done," as suitable.

Correspondence.

Correspondents should never write on both sides of the paper.

LIABILITY OF PLATE MAKERS.

To the EDITORS.

GENTLEMEN,—I beg to submit for the consideration of my fellow professional workers, the question whether the time has not arrived that some united action should be taken to test the liability of plate makers for issuing inferior and defective plates. This day I have had several plates frill completely off the glass, and the thermometer at freezing, and alum freely used.

They were a fresh batch of Belgian make, which bears good repute, and my loss thereby is several pounds, to say nothing of the humiliation of having to return the money and loss of prestige occasioned thereby. Most of us have had, unfortunately, a similar experience to mine, a whole day's work lost from some defects in the plates, whether English or foreign.

Cannot the makers be brought to book if it can clearly be traced home to them? I should be pleased to contribute ten pounds to any fund raised for the protection of photographers against the issue of inferior plates by makers, as now we are completely at their mercy.—I am, yours, &c.,
FRED. T. PALMER.

Clarenee Studios, Kingston-on-Thames, October 12, 1887.

AMMONIA AND WATER.

To the EDITORS.

GENTLEMEN,—In the leader in your current issue on ten per cent. solutions, you say that one ounce of concentrated ammonia solution mixed with nine ounces of water will occupy less than ten ounces; and in proof of this you adduce a rough experiment in which the mixture is made in a bottle holding (as I gather from the description) more than ten ounces, a partial vacuum being thereby produced in the bottle on closing and shaking it. This is certainly the case. But it is due, not to any change in volume in the liquid, but to the fact that on pouring strong ammonia solution into an empty bottle sufficient gas escapes to expel part of the air from the bottle; on then pouring in some water and corking the bottle the gas is reabsorbed by the added water on shaking it up, and so a partial vacuum is produced.

I have just tried the experiment of mixing the liquids in a small stoppered flask with a narrow neck. I first half filled it with water, and then carefully filled it up to a mark on the neck with strong ammonia

solution, avoiding agitation as far as possible. On then putting in the stopper, shaking well, and cooling to the original temperature, the mixture still stood apparently at exactly the same mark. If there is any change of volume (as doubtless there is) it is far too small at any rate to be measured by rough experiments, even though made on a correct principle.

You will, I am sure, excuse my making this little criticism in the interests of accuracy. With the rest of your article I heartily agree, especially the suggestions in the final paragraphs.—I am, yours, &c.,

October 17, 1887.

W. F. DONKIN.

TEN PER CENT. SOLUTIONS.

To the Editors.

GENTLEMEN,—May I be permitted to offer a few remarks in reply to your editorial *re* an article of mine on *Ten per Cent. Solutions*, especially as I have to cry "*peccavi*" in some instances, though in the main I stick to the correctness of my reasoning?

I still hold that there is a difference between "ten per cent." and "one in ten," though by shearing my words of their context, this becomes less apparent. I said, "This is not . . . but rather a solution of one in ten, one grain of pyro in ten minims of water."* Now I still maintain this, and hold it is not a ten per cent. mixture by weight, for ten minims of the solution do not weigh ten grains, although they contain one grain of pyro; and it certainly is not a ten per cent. solution by bulk, for whilst ten minims of water cube .36 cubic inch, one grain of pyro does not cube .036 cubic inch.

I certainly argue that 100 cubic centimetres of solution containing one gramme of dry salt is neither a 100 per cent. solution by weight, for it will weigh more than 100 grammes; nor one by bulk, except the salt happened to have the same weight for bulk as the liquid.

My statement "one ounce of pyro dissolved in ten ounces of water is a ten per cent. solution by weight," is, of course, a mistake. It should be one ounce of pyro added to nine ounces of water. I have also made a most careless slip in giving directions how to make a one in ten solution. The article was written in a great hurry, and I had no chance of reading it. In a letter of mine *re* the same subject, written prior to this article, and published in the *Amateur Photographer* of the 7th, I have, however, stated this correctly.

You say further on, "The solution containing one ounce of pyro in a volume of ten fluid ounces is, despite Mr. Clark's statement to the contrary, strictly and accurately a ten per cent. solution both by weight and volume." This I distinctly challenge. Do you really mean that if we put our measure into a balance and weigh out an ounce of the solution it will contain one-tenth of an ounce of pyro? I maintain that the density of the solution being now greater than that of pure water, when we weigh out an ounce we shall get less bulk, and therefore less of the salt. And the same holds good as to bulk. Even supposing that we make up a real ten per cent. mixture by weight, that is, one ounce of pyro plus nine of water, and use a grain graduate, we are no better off, for the grain volume of solution will not weigh the same as the grain volume of water. Take an exaggerated case, gold and mercury. A ten per cent. mixture of these by weight made up as above, will not produce the same results as an ounce of gold dissolved in sufficient mercury to make a volume of ten fluid ounces, and yet the first is a ten per cent. mixture by weight! A further ten per cent. mixture could be made by measuring both the gold and mercury by bulk. I tried to point out these anomalies in my article, though I appear to have failed, at least judging by your criticism. And it was to evade them that I proposed to use (what I believe to be generally used) a solution ten minims of which shall contain one grain of the salt, and call it, for distinction's sake, a one in ten solution.—I am, yours, &c.,

LYONEL CLARK.

Camera Club.

THE PHOTOGRAPHIC EXHIBITION.

To the Editors.

GENTLEMEN,—The catalogue of the Photographic Society's Exhibition is carefully corrected by direct comparison of each entry with the original paper sent in by the exhibitor. In many cases it is impossible to insert the whole of the long titles or quotations given, or detailed descriptions of processes or apparatus, and it must be left to the discretion of the compilers of the catalogue to abbreviate such titles.

Mr. George Smith complains, in your current issue, that his exhibit is "erroneously described as lantern slides." On referring to Mr. Smith's entry form, I find these words:—"Lantern slides (Woodbury process), mounted as transparencies for window decoration." A description follows, much in the same terms as those used in Mr. Smith's letter to you.

It is obvious from this that the entry in the catalogue is, though brief, certainly not erroneous. As, however, my desire is not only to justify the Assistant Secretary, but also to meet the wishes of Mr. Smith (and every other exhibitor) as far as possible, I am glad to be able to somewhat extend the description of No. 696 in the proof of the catalogue just being sent to the printers for the members' edition.—I am, yours, &c.,

October 14, 1887.

W. F. DONKIN, Hon. Sec. P.S.G.B.

* Solution would have been a better word.

PHOTO-MICROGRAPHS AT PALL MALL.

To the Editors.

GENTLEMEN,—Having been awarded a medal for the above, I suppose I ought not to complain if some of the reviews seem to have missed the chief characteristics of my exhibits, and, therefore, have criticised them depreciatorily. May I therefore crave a little space to point out my chief aims in this work? These have been, 1st, the selection of rare and beautiful objects, not ordinary "commonplace" shilling slides; 2nd, to see what success was possible in the acknowledged difficult and rarely worked field of dark ground illumination, i.e., opaque objects by reflected light, and objects lit by spot lens or paraboloid; 3rd, the overcoming as far as possible that greatest of cruces in photo-micrography, the focussing of all planes with equal sharpness, even in extra deep objects such as, for instance, polycistina—opaque—taken with the one-inch O.G.

It was my success in these latter points—artistic and natural effects in illumination and great depth of focus—that elicited the very high praise accorded me at the Royal Microscopical Society (see their *Journal*, June, 1883, pages 557-560). It was disappointing, therefore, to find the *Times* and other papers giving my exhibits but superficial criticism, the reason being, I suppose, that the objects being of a class to be quickly recognised, and no special knowledge of the difficulties overcome being available, it was easiest to dismiss them perfunctorily as "commonplace," and "not above the average of such productions," and to accord all the praise to a class of work which, however well done, is still unintelligible to the great majority.

I refer, of course, to Mr. Pringle's beautiful specimens of bacteria and bacilli; but I would ask how many of the visitors (including the critics who see in them "difficult work and definite progress") are able to gauge the accuracy of these photographs, or their truthfulness in rendering the living originals?

None but actual students and workers can at all appreciate (I don't mean enjoy) them at their real value. "Definite progress" means, if anything, progress beyond other work of the same kind. Are these, then, better than Dr. Crookshank's as shown at the Royal Microscopical Society? Personally, I take no interest in bacteria, they have no structure to pay for care in delineation, I do not believe they ever have had or ever will have the slightest value therapeutically, and I am glad to find that they are fast losing their interest and value pathologically; even the redoubtable Pasteur is past his zenith, rival experts and theorists are already decrying the value of his processes and supposed results. I may confess that Mr. Pringle's beautiful photographs charmed me most as specimens of exquisite decorative designs; the character and display of the image, the very artistic printing and mounting, struck me very forcibly in this light.

The depreciatory opinion of my exhibits passed in the *Photographic News* (7th inst.) contrasts very curiously with the same paper's remarks on some of the same objects when shown at the Royal Microscopical Society. "These photo-micrographs were of singular beauty and excellence, the principal feature being that, though the objects were opaque and the surface irregular, yet all the irregularities were in focus" (see *Year-Book*, 1887, page 156).

I find that the limit to the successful showing of widely divergent planes in focus together, is so soon reached with the present style of object glasses, that I think it must be this effect that is alluded to by Dr. Klein, when he says (as you quote in *JOURNAL*, August 19, page 516), that "no real advance has yet been made in producing photographs to take the place of accurate drawings of objects under high powers." It is only too evident to workers that the higher the power employed the greater apparent divergence in planes; therefore, as there is no probability of optical laws being altered for our special needs, it must be only with a new style in object glasses that further success in this direction can be reached, perhaps, as Dr. Klein says, "with the now apochromatic objectives and projection eye-pieces by Zeiss, better results may be looked for."—I am, yours, &c.,

FRED. H. EVANS.

158, Osbaldeston-road, Stamford Hill, N., October 17, 1887.

A PHOTOGRAPHIC CONFERENCE.

To the Editors.

GENTLEMEN,—Would you be good enough to permit it to be announced in the *JOURNAL* that the Committee of the Camera Club has decided to organize a Spring Photographic Conference in 1888 similar to that held in 1887? An influential committee of members has been appointed to carry out the necessary arrangements.

The Conference will be held on Tuesday and Wednesday, 13th and 14th March, in the Hall of the Society of Arts, the use of which has again been kindly granted by the Council.

The President of the Club, Captain W. de W. Abney, will preside, and the proceedings will commence each day at 2 p.m. At the same time there will be held in the Library of the Society of Arts an exhibition of apparatus and one of members' photographs, the latter at the Club rooms.

Lantern slides will be shown on the evening of the first day of the Conference, and at the conclusion of the second day the Annual Club Dinner will be held.

On the Monday evening previous to the Conference a Smoking Concert will be given at the Club-house.

Further particulars will be announced later.—We are, yours, &c.,

G. DAVISON, }
E. G. SPIERS, } Hon. Secs.

Camera Club, 21, Bedford-street, W.C., October 17, 1887.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

- J. Browning, Exeter.—Three photographs of Exeter Cathedral.
- F. Hoare, Cirencester.—One photograph of J. Sewell, Esq., of Cirencester.
- F. Shemid, Sheffield.—One design for label (paper). One design for label (cardboard).

- WM. A. BRICE.—Specification being proceeded with.
- GEO. BAINES.—Prepared ox-gall is supplied by all artists' colourmen.
- RHINE STUDIO.—We are not acquainted with the "Phoenix dry plate ferros," so, of course, cannot suggest an improvement in their development.
- A. B.—Probably you did not make the solution of gum arabic thick enough. If you have used starch for so many years successfully, why make a change? You can have nothing better.
- T. COAN.—We have seen lenses by A. which were equal to those by B. as effective working tools, but of course they have not the same commercial value. Better test before purchasing.
- W. WALLIS.—1. We recommend you to join the London and Provincial Photographic Society; the subscription is five shillings a-year.—2. See correspondence in the present number.
- MR. A. BOWLER sends us samples of sensitised paper prepared by him. Although barely sufficient to enable us to give it a thorough trial, yet from what we saw it seems to be a good brand.
- FOX.—As the sulphite of soda is in the state you say it is useless for photographic purposes. We cannot explain the cause why the faces of your portraits are "all black." Better send us an example to see.
- BROMIDE.—Bromide paper is usually coated by elaborate and expensive machinery; but the small sizes you require may be coated by floating the paper on the emulsion. Those who supply the paper will tell you if they will cut it to your sizes.
- AN ANXIOUS INQUIRER.—The photograph shows the studio to be a good one, and one that is very convenient to work in. If you get flat pictures it is clear that you are not managing the light properly. Send us a few examples of your work, and we will try and indicate where you are wrong.
- QUANDARY.—If the operations were carefully carried out the prints would certainly not have faded in so short a time. The formulae appear all right but the fixing bath is much weaker than is generally used. We presume, however, that you allowed an approximately longer immersion on this account.
- A. J. CORRIE.—1. A candle placed behind one thickness of red calico, over which there is no covering, is certainly not a safe light to develop by, if the development is a protracted one—this may possibly be the source of your trouble.—2. Light from some source or other was the cause of the fogging of the negative you forwarded.
- W. COLES asks: "Is a speaking tube practicable to communicate between distances a hundred feet apart? If so, what should be the diameter of tube?"—We should say that a speaking tube will answer quite well for that distance, and that a three-quarter or an inch tube will be the best size. Perhaps some correspondent who has had practical experience in this direction will give the benefit of his experience.
- J. E. O. asks how much carbonate of soda he ought to add to the last washing water prior to toning; also how to tell whether the toning bath is neutral or otherwise.—If the prints are treated with soda before toning a small quantity only should be used. A crystal the size of a filbert in a quart of water is sufficient. The condition of the bath as regards its neutrality can be ascertained by testing it with litmus paper.
- T. GULLIVER.—We have seen a very bright disc of about five or six feet produced with the microscopic lantern mentioned, mixed gases and a rather low power objective having been employed. For such low powers a portrait combination suitable for postage-stamp or locket portraits answers very effectively. It is necessary to have a plano-convex condenser near to the stage. This condenser should be adjustable as to distance from stage.
- ASSISTANT writes: "I have a negative (dry plate) that has been coated with enamel collodion and afterwards varnished in the usual way, but having to take off the varnish afterwards for enlarging purposes, I find I cannot remove the collodion, and it has also left the negative all cracks. I have tried ether and alcohol without success, and consequently am in a fix, as the party cannot rest. Would you kindly give me your advice on the matter?"—If a mixture of ether and alcohol will not remove the collodion we fear the case is hopeless. Perhaps revarnishing the negative may restore it to something like its original condition.
- C. B. writes: "I have been using lately a ferrons oxalate developer, made up as at page 203 of the ALMANAC for 1886, but I find I have invariably to intensify the negatives before printing. Is it always necessary to intensify with this developer, or is the formula at fault? I find also, that if mixed and left to stand for a few days, iron is deposited and the developer becomes useless."—In reply: The formula is a very good one. It is seldom that negatives developed with this developer require intensification. The thinness, in our correspondent's case, is possibly due to under development or error in the exposure. The oxalate and iron solutions should only be mixed just before using, as the mixture quickly loses its energy. If "C. B." is in the habit of mixing them days before use, the thinness of the image is fully accounted for.

J. COURTIER.—The value of the stops expressed in terms of the focus of the lens are got by dividing the focus of the lens by the diameter of the stop. Thus, in a sixteen-inch lens a stop of one inch in diameter is f_{16} , but Mr. Burton's table is only of use to give an idea of exposure, and is calculated for no particular kind of plate but only gives an approximate ratio. The U. S. numbers of your stops are open aperture, .878 : 1, 1.72 : 2, 2.25 : 2, 4 : 4, 9 : 5, 36 : 6, 148. Page 343 explains itself.

GREENHORNE says: "I was told by a friend the other day that any dry plate could be rendered extra quick by immersing it for about half a minute in weak ammonia water. Is that so? I tried and fancied it caused the plate to darken after the development, especially after mercurial intensification. Am I right in my conjecture? Would you kindly inform me if the process spoken of is true, or do you know of any process that would render dry plates (ordinary) extra quick? If so, please oblige me. My lens being only quarter-plate of six-inch focus, is it possible to get a good full-length portrait on a $6\frac{1}{2} \times 4\frac{1}{2}$ plate without distortion with the glasses reversed as for a view lens?"—In reply: The sensitiveness of some plates may be slightly increased by the ammonia treatment, but not all. It is far better to purchase extra rapid plates than to attempt to increase the sensitiveness of slow ones. The six-inch focus lens will not take a half-plate portrait without straining. However, if one of the components be used as a single lens, stopped down, and with its convex side next the ground-glass, it will answer the purpose very well. We are assuming that the lens is a double combination.

A CORRESPONDENT writing from Halliwell, Bolton, says: "1. I have noticed when taking an interior of a church, a second image of the east window on the negative close to the real one. It was taken on a backed plate with Dallmeyer's triplet lens, and a medium-sized stop. Could you tell me the reason, and what I could do to avoid it? It has not appeared on all negatives taken of interiors of churches, and it is rather disappointing, as I did not find it out till unable to take another.—2. I should be glad to know how much of a solution of hypo (four ounces to the pint of water) it takes to thoroughly fix each sheet of paper, as when I have a good many prints to fix at one time I am doubtful how much solution to use to fix them properly without having a great excess."—In reply: 1. This is caused by a minute hole in the camera front, presumably an ill-fitting screw.—2. Without knowing how much chloride of silver there is in the paper to be dissolved, it is impossible to say. But as hyposulphite of soda is so very cheap, it is usual to use a very large excess over what is known to be the theoretical quantity required. This is with a view to greater stability of the prints.

HOGARTH writes as follows: "Being desirous of photographing a series of lantern slides on 'Hogarth's works,' for trade purposes, I will be much obliged if you will be able to inform me in your 'Answers to Correspondents' whether I am able to copy the engravings in the following work, and offering the slides for sale, without infringing any copyright, &c. The book in question is, *The Complete Works of William Hogarth in a series of 150 superb engravings on steel from the original pictures.* With an introductory essay by James Hannay, and descriptive letterpress by Rev. J. Trusler and F. Roberts. Published by the London Printing and Publishing Company, London and New York. About three years ago I wrote to the 'London Printing and Publishing Company' respecting this work, and asked them if permission could be obtained for taking slides from the engravings in the book, and they replied 'that they would give me permission on payment of 2l.' I did not write to them again, but thought I would ask you if the work was copyright, and if it was really necessary that I should have to pay this fee?"—In reply: The copyright in Hogarth's works expired years ago. But this appears to be a modern work, and in which there may possibly be some sort of copyright; there certainly would be in the letterpress. There is nothing whatever to prevent you from copying the original plates, which, of course, are far more valuable than modern replicas.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, October 26, 1887, will be on *Orthochromatic Photography*, on which a paper will be read by Mr. J. B. Wellington.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting of this Society will take place on Tuesday next, October 25, at eight p.m., when the apparatus now in the Exhibition will be shown and explained. Also, on the same evening, the adjourned special general meeting, for the consideration of the proposed new rules, will take place at six p.m.

GEORGE NELSON, DALE, & Co.—This firm of gelatine manufacturers, of Emscote Mills, Warwick, and 14, Dowgate-hill, London, has been registered as a Limited Liability Company, under the style of George Nelson, Dale, & Co., Limited. There will be no public issue of shares, the whole being taken up by the existing partners. No change will take place in the management of the business.

LAST Monday evening the optical lantern was brought into use at the Exhibition for the first time this season, when "Schauffieff's" electric battery (to which a medal was awarded last year by the Society) was used with remarkable success, an arc lamp, supplied by Woodhouse and Rawson, having been arranged to work inside the Society's lantern. We understand that next Monday evening, October 24, the members of the Amateur Field Club will, in accordance with their annual custom, exhibit slides in the lantern.

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PHOTOGRAVURE.

DURING the different visits we have paid to the present Photographic Exhibition, we have heard quite sufficient to convince us that a majority of the admirers of the photogravures there shown—although many of them are evidently amateur photographers—have no very clear conception as to how they are produced. We have often overheard such remarks as the following:—"Oh, very beautiful, but they are not printed direct from the negative;" "They are printed in some way from gelatine;" "They are done by some secret process, they are not photographs at all;" &c. Many appear to be utterly ignorant of the fact that the impressions are produced from metallic plates in printers' ink, and in an ordinary copperplate press, in the same way as are line or mezzotint engravings.

It would, we are fully aware, be an act of supererogation with the majority of our readers to explain what is photogravure. It is, however, for the enlightenment of novices in matters photographic—such as have but recently entered the ranks of photography—that the present article is written. It may be explained in commencing that there are two distinct classes of photographic engraving; one in which the design is in relief, as in the case of woodcuts, where the impressions are obtained by surface printing, and the other where it is in intaglio, the prints being taken in the same way as they are from an engraved steel or copper plate. To the latter class the name of photogravure is now generally applied.

The production of intaglio plates may be divided into two different classes; in the one the image is etched or bitten into the plate with a corrosive material, and in the other the printing plate is made by depositing metal, by the electrotype process, upon a design which has been obtained in relief in gelatine. The former plan was introduced and patented by Fox Talbot so long ago as 1852, and the latter by Paul Pretsch in 1854. These two systems, it may be mentioned, really form the basis of most, if not all, of the modern intaglio photographic engraving processes.

Talbot's method, by which he produced some excellent results at that period, consisted in coating a metal plate with bichromated gelatine. After the image had been printed in this it was treated with a corroding fluid which penetrated the film freely where the light had not acted, and so attacked the metal, while it was resisted by those parts which had been protected, in proportion to the light action modifying the condition of the film. In his first process Talbot employed a solution of bichloride of platinum, and, in his later patent, he claimed the use of perchloride of iron as the etching medium. Now it is not sufficient merely to produce the image in intaglio, but it must also possess a grain or rough surface to hold the

ink. A Woodburytype block, for instance, cannot be used for intaglio printing because, on account of its smoothness, it would not retain the ink.

Talbot obtained his grain, first of all, by printing the picture through gauze, but, later on, by dusting over the film, after it was printed, a resin in fine powder, and then heating the plate till the former was just melted and rendered adherent. The particles of resinous matter acting as a resist caused the image, when bitten in, to have a fine grain. Talbot's method may really be considered practically as the basis of all the modern intaglio etching processes. In most of these processes, as now worked, the resinous material is applied direct to the metal plate, and the gelatinous image developed upon it after the manner of a carbon print.

The electrotyping method may be classed under two heads, namely, where the necessary grain is produced chemically, as in the method of Pretsch, or mechanically, as in the processes of Woodbury or of Waterhouse. By the former method the relief image is obtained in, so to speak, a reticulated or granulated state, and this grain, in the electrotype, forms the ink holding surface. What may be termed the mechanical grain was secured by Woodbury by mixing a gritty material with the gelatine with which the relief was made, so that when the image was developed, instead of having a smooth surface, it possessed a rough or gritty one, which was reproduced in the electrotype intaglio or printing plate.

Waterhouse obtains his grain by dusting over a wet carbon print, developed on a metal plate, a gritty substance—powdered glass or emery, for example. When the whole is dry, the gritty matter, which has caused the image to be grained or roughened, is removed. The granularity thus caused forms the tooth which retains the ink in the electrotyped plate, from which the impressions are produced.

The method of printing from an intaglio plate differs entirely from that of printing from a relief one. In the latter case the ink is simply applied with a roller to the raised image, and the print is then taken from it in an ordinary type printing press. In the former the ink is applied to the whole of the plate. It is then carefully wiped off from the surface, leaving it undisturbed in the intaglio portions. On the *inked in* plate a sheet of paper is placed, and the whole passed through a rolling press, with several thicknesses of fine woollen blanket interposed between the back of the paper and the roller. The elasticity of the blanket causes the paper to be forced, with great pressure, into contact with the ink, which then adheres to it.

In the foregoing we have only given a brief sketch of the systems by which photogravure prints are produced. Of

course there are many modifications of these methods, and those who work them, commercially, studiously keep the details of them as profound trade secrets. But, in most cases, if the secret were out, it would be found that it really consisted more in the skill of the operator than in anything which had not, at one time or other, been published in our columns.

THE question we raised with regard to ten per cent. solutions was as to whether it was practically worth while to raise an outcry about a difficulty that does not exist. Mr. Lyonel Clark thought it necessary to distinguish between "ten per cent." and "one in ten" solutions, and alleged that it was a practical impossibility to make a true ten per cent. solution of a solid salt. As a matter of fact, it is perfectly easy to make percentage solutions *either* by weight or volume, but not to combine the two, and we were wrong in saying that a solution containing one ounce of pyro in a volume of ten fluid ounces is *strictly and accurately* a ten per cent. solution both by weight and volume. It is strictly so by volume if properly used, and *practically* so by weight, though not accurately; the error being far less than the original one Mr. Clark sought to remedy. Our contention is, that setting on one side entirely the question of theoretical accuracy in percentage solutions, the differences that occur are not such as to sensibly affect development. Mr. Clark, however, comes forward as the champion of extreme accuracy, but after crying "*peccavi*" in his letter of last week to certain errors we pointed out, and which he attributes to hurry in writing, he still errs when he says in the second paragraph of his letter that "ten minims of water cube '36 cubic inch." As a cubic inch of distilled water weighs about 252.5 grains, Mr. Clark's figures require dividing by ten.

PROFESSOR DONKIN'S experiment, too, shows how little trouble is likely to arise in development from want of strict theoretical accuracy in these matters. We mentioned the theoretical shrinkage in volume on mixing ammonia and water, because Mr. Clark has stated that the mixture of these liquids in certain proportions made a true percentage solution; and we, in the interests of the strict accuracy he aimed at, pointed out that, by the laws of the expansion of liquids, such was not the case. We never for a moment supposed, however, that this valuation of volume would be of any moment to the photographer, who accepts and uses without experiencing any difficulty anything that is given to him under the name of "liquor ammonia '880." Before we commence to be so very particular in our methods of weighing and measuring, let us take care that we have some definite material to work upon.

AN important communication on photo-astronomical matters, by Professor Pickering, the director of the Harvard College Observatory, has recently been published. It is upon a *New Form of Construction of Object-Glasses intended for Stellar Photography*, and is plainly indicative of the very important position now held by photography in regard to astronomical observation, as it is neither more nor less than a proposal to make important alterations in the curves of the object-glass, and this combined with arrangements for changing the position of one of its components. Professor Pickering points out that the ordinary corrections applied to astronomical object-glasses to avoid chromatic aberration unfit the lens for use in photographic operations. He indicates two modes of remedying the evil. The first is that adopted in the great Lick telescope (whose progress has been at its various stages brought before our readers): it consists in adding an extra lens of long focus to the usual object-glass when photographic work is required. But the great objection to this method is the large additional outlay it entails, besides the fact of its adding two extra surfaces, with their necessary reflections and possible increase of errors. There are many possessors of good telescopes, *in esse* not to speak of those *in posse*, who would not care to go to such an additional outlay for photographic purposes, but who yet would have no objection to adding, to some slight extent, to the cost of their instrument to fit it for stellar photography. Such observers will be suited by Professor Pickering's new design.

THE objectionable excess of correction for colour may, as is well known, be corrected by separating the components of the objective; but then, though there may not be two foci, a "chemical and a visual," there will be introduced increased spherical aberration, as the central rays will have a longer focus than the marginal. This error, however, is obviated in the second method named by Professor Pickering, by giving different curves to the two surfaces of the crown lens, and then, when the lenses are separated for photographic purposes, reversing the crown lens. This method has been tried and found to answer quite satisfactorily. Messrs. Alvan Clark & Sons first tried the effect with a small glass specially made under this new arrangement, and, finding it to answer, they made a large one, thirteen inches aperture and about one hundred and eighty focus. It has been found to give excellent definition for eye observation, and when the crown is removed three inches from the flint, and also reversed in position, it gives photographs of equal excellence. In ordinary work the two lenses are placed in contact, with the more convex side next the flint. When used for photographing, the convex side of the crown is made to face the plate and brought slightly nearer to it. It may be interesting to state the actual curves:—For the crown-glass lens the radii of the two surfaces are 86 and 77 respectively; for the concave side of the flint 73.8 inches; for the convex—that turned to the eye-piece—1020 inches.

THE bright iron and the steel-work of rolling presses and such-like photographic implements is, in a general way, not much in the way of getting rusted through disuse; but there are at the same time many photographers whose call for the use of such appliances is but spasmodic; to them, therefore, any plan which would enable them to feel secure from the danger of rust and stain, no matter how long a time their presses, &c., were left idle, would be most welcome. Some of the better class of instruments are provided with silvered plates and nickelised rollers, thus reducing the danger to a minimum; but all these things mean extra cost, and, besides, there are presses still in use that were designed long before the introduction of these luxurious additions, and they need looking after. For a steel plate for which a long rest is anticipated, it is well to prepare it in the fashion adopted by the makers when they send them out—the plate is heated and smeared with wax. The plan is perfect; but when it comes to a question of removing the wax there is a difficulty; time is required and temper usually displayed. A foreign journal describes a remedy, or, rather, antidote against rust, which would appear to be of real value. Aluminium is dissolved in palmitic acid, a product being obtained having the power of dissolving zinc. An alloy of aluminium and zinc is thus obtained, and if applied to the polished surface with a brush it prevents oxidation. Another writer shows that super-oxidised linoleic acid acts equally well and does not injure the metallic lustre.

THE season of snow is rapidly approaching, and as the tradition of the intense purity of snow and, consequently, of its eminent suitability for the production of absolutely pure water by being melted, still largely prevails, it will not be without interest if we describe the result of a rather recent analysis of snow taken in the neighbourhood of a large city. On one day when snow fell there were present in it sulphuric and sulphurous acids, and in equal proportion; but upon examining it the next day all the latter acid had disappeared—it had been converted by oxidation into sulphuric acid. The result of the use of a weak solution of sulphuric acid (for that, in effect, is what would be obtained by the melting of such snow) under the impression that pure water was being used may be readily imagined.

THE production of cheap oxygen really appears to have become, on a commercial scale, *un fait accompli*, and the future possibilities of its use in matters photographic cannot be readily grasped in the mental vision. Of course limelight and optical lanterns at once suggest themselves, but they form a part—a small part only—of the possibilities linked with the production of cheap oxygen. The *Chemical Trade Journal* goes so far as to say that the selling cost is put down at about three shillings a thousand feet, but this, we need scarcely state, is not the price delivered at our doors. In calculating the price of coal gas at

so much per thousand feet, the fact is too often lost sight of that, after all, the chief item of the charge is the cost of delivery, a sum including all the interest of capital, cost of laying, and the wear and tear and keeping in condition of the hundreds of miles of gas mains underlying our streets. But, at the same time, such a sum as three shillings per thousand feet is enough to make all the magic-lantern makers in the world pause ere they construct another lantern intended to be used with oil—animal, vegetable, or mineral.

THE PHOTOGRAPHIC EXHIBITION.

IV.

THOMAS FALL (No. 149), "*Lion*," *Mastiff*.—This is the head of a dog enlarged, one of a series of five, all being life size. They are certainly very fine productions as far as they go, being only heads, but it is a pity that in some so much brush work has been found necessary to give detail to what otherwise would have been white patches. The framing of these photographs is very effective, being dark wood with good mat and dark-grained wood mounts.

Robert Slingsby (No. 164), *Waiting*.—This is the best picture out of the three by this exhibitor, who has been working with more strength in light and shade than formerly. The subject is a young lady ready equipped for a walk waiting for some one. With one exception the pose of this figure is expressive—we allude to the right arm raised so that the hand resting on the top of a screen is higher than the head; this position, which is not graceful, disturbs the idea of repose which the title should include.

Frank Salter (No. 168), *The Bernina Range*.—A panoramic picture where three negatives have been very cleverly vignetted into each other; but some remarks we have already made on a similar subject will equally apply to this one. The senses are not appealed to for any sympathy.

W. J. Byrne (No. 184), *Princess Hélène d'Orléans, &c.*—A frame of three different direct portraits 24 × 18. The pose of the princess is very simple and effective, but the shaded side of the head being too dark lacks rotundity; a light background being used intensifies this still more. Another lady is very well treated; she has a lace covering, but to secure detail the face has been under exposed, and consequently has been subjected to a vast amount of retouching. The gentleman's portrait is the best of the set, with a very light coat, grey hair, and the markings of age; these are all well rendered photographically. Again we observe that the brush has been used unsparingly on the ladies' photographs, otherwise they promise well for the future of direct large work.

George Mold (No. 189), *St. Mary's Church, Banbury*.—A very well done and effective interior, where local difficulties have been mastered and an idea of grandeur suggested.

J. Hubert (Nos. 202 and 203), *Who can be Playing*.—Two small pictures pictorially conceived and fairly carried out.

H. W. Macdonald (No. 204), *On the Thames*.—Four small pictures of well chosen, pretty backgrounds, with a family boating party in each. Also very nicely arranged, but the effect is rather weakened by so many reflections on the placid surface of the water, which however good, disturbs that repose which the eye requires upon looking at pictorial scenes; otherwise these photographs are very satisfactory.

F. Whaley (No. 206), *The Firstborn*.—Another successful attempt at picture making. A young mother whilst at needlework watching a baby in a cradle. The various objects in this photograph are well put together, and a soft tone pervades the scene (which would have received more value if a darker mount had been used), but it is too realistic. The painter would have introduced colour, which suggests so much more than monotone, and a more refined and delicate model would have been better from an imaginative point of view.

Symonds & Co. (No. 203), *Yacht Racing Scenes*.—We have already made some remarks upon similar pictures which equally apply to these. But there is one matter appertaining to this collection which must be noticed; it arises from so many (nine) pictures being placed in one frame, the height of the sea line being different in each picture. This is very distressing to the eye, which would have been avoided if each picture had been framed separately. These are small matters,

but it is just the avoidance of them which helps to raise the pictorial value of photography at exhibitions.

G. Watmough Webster (No. 213), *Eaton Hall Mantelpiece*.—We take notice of this picture with the simple remark that it is a very good example of technical excellence, and more particularly on account of the colour (platinotype), which suggests the original.

Vernon Heath (Nos. 214 to 225), *Views, &c.*—The pictures which this veteran photographer exhibits are technically good. The distances are rendered very pure and delicate, but somehow they do not quite convey that idea of space and barrenness which nature does. We can only attribute this failing to the absence of local colouring, and possibly to the scenes not being chosen with a view to that rugged contrast which should be the artist's study in such desolate places.

H. S. Mendelssohn (No. 228), *H. Perigal, F.R.A.S.*—This is a very fine study of a well-known scientist, the head being about six inches, and the white hair which confers such picturesqueness upon the original has been well rendered; but how comes it that a hand upon a book which is close to the edge of the picture, and in apparent advance of the face, should be so unaccountably small? This is very singular in effect, because wrong in fact.

T. A. Green (Nos. 234, 235, 236).—These are very nice pictures of the Lake District, being well chosen, the first showing a large extent of one of the lakes, and giving a most satisfactory idea of what this beautiful country is like; the second picture has strong contrasts between a foreground tree and some distance; whilst the third, to which a medal has been awarded, shows a vast mountainous range with some trees in the middle distance. They are in platinotype, which, as previously observed, seems so admirably adapted for giving aerial perspective.

S. G. Payne (No. 241), *The Trout Pool*.—This is a very good subject and has been photographically well treated, but there is always some risk in managing a scene where one half consists of water, with the reflection of the upper portion strongly detailed. The painter by local colour can alter this effect, but the photographer, and more especially when the water is quite placid, is compelled to give a more powerful rendering, and this result is not satisfactory.

J. Gale (Nos. 245 to 252).—A series of most effective studies by this well-known artistic photographer, consisting of figures with building and landscape backgrounds. They are all cleverly arranged, but there are some parts which are too solidly black to be quite in keeping or in harmony with other parts full of exquisite detail. We could have wished that these pictures had been in platinotype, when possibly a still more artistic effect would have resulted.

H. Collis Pettitt (No. 267), *Views of the English Lakeland*.—A series of six pictures, where again good results have been achieved by platinotype, which gives to masses of distant foliage such a retiring and soft character. A medal has been awarded these photographs, and they most certainly give some positive notion of the beauty as well as the ruggedness of the actual scenes. We venture to suggest that if panoramas of these subjects could be taken, they would then realise the natural scenes far beyond these instalments. Has Johnson's panoramic camera become a tale of the past? or is it that the modern photographer is ignorant of the existence of such a clever apparatus? At this time of day when the chemical side of photography has achieved so much success, that camera might now be utilised with some most successful results.

John F. Roberts (No. 268), *Scenes from "David Garrick"*.—A series of six small photographs; one half with the same background, the other half, also, with one scene. These pictures have been awarded a medal, not so much for any artistic or subjective treatment, but we presume simply for the attempt which has been made to photograph scenes on the stage, and are so far interesting. We do not know if orthochromatic plates were used, but should think that they would be found very necessary, because if the scenery has been painted to suit the electric light it will be done so with warmer colour. Another rather curious matter which these photographs reveal is that, however realistic the figures may be, they most certainly do not present much artistic posing, which is necessary to make them pictorial.

Francis Cobb (No. 272), *Views in North Wales*.—A frame of six well chosen views. The contrast of water and foliage, however, is strong. Here again platinotype would have greatly assisted the result. And we must once more call attention to the disturbing in-

fluence produced by the close proximity of one picture to another; the eye cannot separate them, and they totally destroy each other.

G. West & Son (No. 276), *Panel Portraits*.—There is much softness in the treatment of these various studies, which, for studio work, are good specimens. But what a pity it is that hands should be cut in half, and arms come down abruptly to the base of the picture! Why cannot these matters be altered in pose, or modified by sunning down? But then the artistic instinct must come into action, and hence photography loses much.

Frederick Müller (Nos. 277 and 293), *Portraits*.—Here we have two frames of cabinet portraits, which, although very commercial in the style of frame arrangement, are really very good specimens of studio work, and, despite a vast amount of retouching, are very admirable in the relation of the figure to the size of picture, and we do not see any of that singular cutting in half of hands and other disagreeable matters just alluded to. These photographs are worth studying.

V. H. Chintamon (Nos. 281 and 288), *Indian Portraits*.—We mention these just to notice the valuable aid which photography now gives to a knowledge of such far distant and mighty personages as these pictures represent—they become thus deeply interesting. There are two more examples on the walls, but being enlargements very much worked upon, their merit does not rest upon photography.

W. J. Byrne (No. 283), *Direct Portraits, Life-size*.—Here we have three notable examples of the "direct" large work in this Exhibition previously alluded to. They are all very powerful in treatment. This may partly arise from the exposure necessary for such large heads not having been quite long enough, hence some parts in shade want luminosity. In one portrait a large amount of retouching has been necessary; the young lady's portrait to which a medal has been awarded being the best—it amounts to an artistic study—and great care has been exercised in preserving the delicate gradations of a white dress, whilst at the same time the flesh tones have not suffered. This is really a very fine picture, and in pose and arrangement goes far beyond ordinary portraiture. With such excellent results as these before us, we may look forward with anticipations of still more advanced direct large heads in the future.

Frederick Müller (No. 290), *Enlargement*.—This is another example of photographic work from Germany done by the Obernetter method, and it possesses most admirable qualities. We have in this picture a registration of an extended scale of tones, which results in a soft and flesh-like appearance, and this tender half tone is marked in some white drapery. The face, however, has been much retouched.

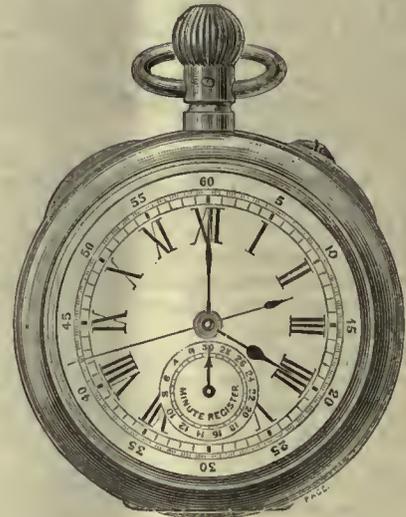
W. McLeish (No. 292), *Studies*.—Three large direct pictures, which command attention from their powerful light and shade and a general picturesqueness of artistic treatment which is very effective. Once more we must say that each of these subjects would have gained immensely if they had been separately framed, or even if a gold mat had been interposed between them. It comes like a shock to the eye to find a mass of light in one picture apparently being carried on into the next, and any possible good that may arise to the exhibitor by having all his works together is terribly discounted by the incongruity just alluded to, and this even is intensified by choosing dresses containing so much ornamental detail, which does away with breadth. There is a considerable amount of retouching and brush work on the flesh, but we suppose this must be pardoned in the early stage of such promising direct photography.

W. F. Donkin (No. 302), *Among the Chamouni Aiguilles*.—Here we have pictures of the tops of Swiss mountains, most beautifully photographed, exquisite in detail, and the most perfect rendering of snow that nothing but a perfect mastery over technical matters could achieve, the result being such a *facsimile* of nature, that we shiver whilst looking at them. The printing on Obernetter's chloride paper seems admirably adapted for negatives of this character.

THE APPARATUS.—III.

ONE feature of a decidedly unique character is to be found in the present Exhibition, in contradistinction to any other which has preceded it. When so much has been done in regard to appliances for effecting the proper exposure of plates either in the outdoor or indoor camera, why should the photographer be longer left without the means of determining with accuracy the duration of his exposures?

Horological science has lent itself to recording the feats on the race-course, the measured "reach" of the river, the flight of a cannon-ball, the duration of a cab drive, the determination of the distance of the luminous precursor of the thunderclap, and why should its services not be invoked in aid of the photographer? Messrs. Lezard & Son, of Holborn-viaduct, answer this question and supply this want, by placing in the Exhibition a case of photochronoscopes, which, being secured from being handled and tampered with by the numerous visitors, cannot by them be examined. But as, through the courtesy of the Messrs. Lezard, we have been placed in an exceptional position for inspecting the mechanism and ascertaining the merits of the photochronoscope, we give the reader the benefit of our examination. First of all, it is a watch of the stem-winding or keyless genus, having an appearance similar to that shown in the accompanying cut. As a mere watch it is finished with extreme care—that



care, in short, which is devoted to the best class of chronographs—lever escapement, jewelled actions, compensated for changes of temperature, and the other etceteras expected in a high-class piece of delicate mechanism. There is a long, poised, steel hand, as fine as a hair, which reposes at zero (at the twelve o'clock chapter), but which, upon pressing the gold button at the top of the pendant, instantly starts into action and continues its rotation around the dial, marking fifths of a second. Every time it makes one revolution, and just as it passes the zero point, another hand on the smaller circle below, and which, like its nimble brother that radiates from the centre, has been standing dormant at its own zero, immediately makes a start, and records the fact that the first minute has passed, another and similar start taking place simultaneous with each rotation of the second's hand. When the event, whatever it may be, that necessitates this recording of time has transpired, the same button is again pressed, the consequence of which is that these recording hands are instantly arrested in their motion, and entirely disengaged from the watch movement, which goes on recording time as usual. The position of the recording hands being noted, once more is the button pressed, by which action the two recording hands immediately fly to their original positions at their respective zeros, where they remain until they are started into life by the pressure upon the button. To the photographer these instruments, which are but little over the price of a watch of equal excellence, cannot fail of being exceedingly useful in recording exposures, the duration of development, or, indeed, anything necessitating an accurate measurement of time. It will be readily understood that all this can be done without looking at the chronoscope, or even taking it out of the pocket.

Marion & Co. exhibit somewhat extensively. Two of their exhibits having only a short time since been specially noticed by us we shall pass them over. These are Leisk's patent Sky Shutter, designed to give a longer exposure to the foreground than to the sky, and concerning which we may here say that we recently received from Mr. Leisk some specimens of instantaneous work done in the Shetland Isles, where he is located, and which testify to the excellence of the

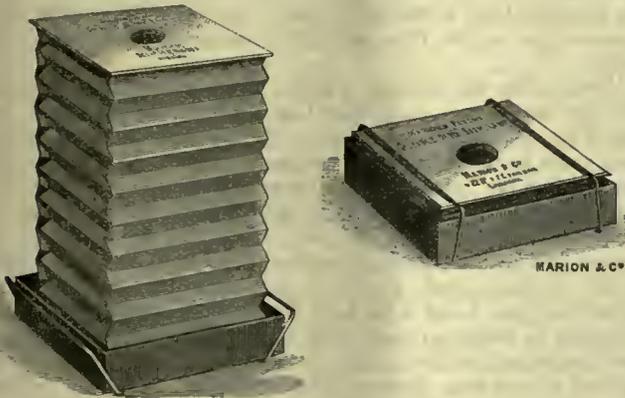
shutter. The other is the Marion Universal Ten per Cent. Developing Set, of which we then gave a verbal description, that we are now



able to supplement by a sketch showing an inside view of the neat box in which the various developing requirements are packed.

The Granitine Dishes exhibited by this firm, one of which is broken so as to show the nature of the ware. It is of such hard material as to be quite impermeable by chemicals.

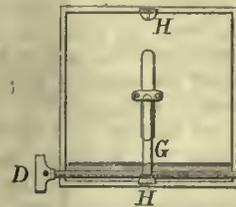
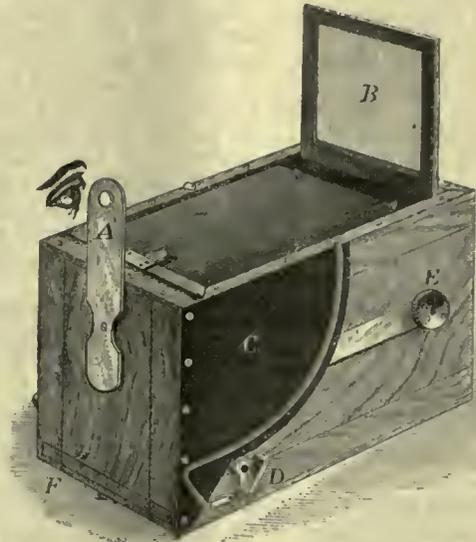
The Collapsible Dark-room Lamp, which this firm exhibits, adds another to the now rather numerous lamps of this class. As shown by the cut, it is composed of a bellows of ruby cloth, inside of which



is a spiral spring which, when released, opens out the body in a Jack-in-the-box fashion. A night-light burner in a tin box forms the source of illumination. Two views are shown in the cut, one being the lamp folded up and the other when expanded.

Another Marion exhibit is Warwick Brooke's Lantern Camera. It is made for plates three and a quarter inches square, and is on the "detective" principle. The lens, shutter, focussing screen, and dark slide are all enclosed in a box-like form. C is a sliding hood, which is lifted when focussing, and takes the place of the focussing cloth. E is the milled head of a pinion, which racks the lens backward or forward for focussing. A and B form the finder, and are closed down when the camera is not in use. The novel feature, however, is the mode of opening and closing the shutter of dark slide inside the camera itself. This is illustrated by the smaller cut, in which D is the end of a brass bar running through the camera underneath the frame into which the dark slide fits, and attached to this bar is a tongue of metal, G. In the shutter of the dark slide is a groove into

which this tongue fits. When the dark slide is to be put in the place of the focussing screen, the head D is turned back until the tongue is in nearly a horizontal position, but leaning slightly backwards, when the back is placed in position, taking care that the tongue passes into the slab. When the shutter is to be opened the small catch H is turned through a small hole underneath the finder A, and the head D being then turned towards the front by which the shutter opens



downwards, and lies down on the bottom of the camera clear of the rays from the lens. After exposure D is turned back, and the catch H being secured the slide may be removed.

There is a large Rolling Press with a steel plate 30 x 20 inches, also exhibited by Messrs. Marion. The workmanship is excellent. A tank for fixing or alum bath completes the exhibit of this firm. It is made of lead with the grooving of granitine, and is encased in a wooden box having a tap at bottom to draw off the liquids. The grooving can be lifted in or out of the box at pleasure.

ECHOES FROM THE SOCIETIES.

SOME sensible suggestions were made at a recent meeting of the London and Provincial Society with regard to lens mounts for tourists' purposes. First, with regard to the weight of the mount, what but the expense and the unwillingness on the part of makers to leave a fixed groove prevents the suggested adoption of aluminium? Its difference in colour would scarcely, I should imagine, be allowed to militate against it, for it is at least as pleasing to the eye as many of the tints of lacquer that we meet with in foreign and home-made lenses, and something would certainly be gained in lightness.

But for my own part, I do not think the question of weight is the one of greatest importance. With the larger sizes of lens it, of course, becomes a serious matter, but taking lenses all round, it is, I think, the bulk rather than the weight of the mount that requires reform. Let me not be misunderstood. I mean unnecessary bulk—bulk that might be reduced by the exercise of a very little ingenuity. I know that a lens must possess a certain diameter, and its elements must be separated a certain distance, or, if a single lens, the stop must be placed at a given distance, and that, therefore, the dimensions of the mount are, in a manner of speaking, fixed. But turn from lens

mounts to cameras. I take 12×10 pictures and use an eighteen-inch focus lens, but I do not find it necessary to carry about with me a camera that resembles a Newfoundland dog-kennel, and that requires a clothes-prop to reach from the focussing glass to the front. The old folding-body camera has long since disappeared from everywhere except Stevens's sale room, and camera makers have gone in for portability. Why cannot our opticians follow the example?

Of course, I am speaking of lenses generally, for no one can complain of the unnecessary bulk of lenses of the type of the portable series of symmetricals; then, again, one or two opticians have made a step in the direction indicated, by reverting to the old conical form of mount, but this is to me an unsightly form and never likely to come into general favour; besides which, though it may be a little lighter, it takes up just as much packing room. Grubb introduced a form of mount for his single lenses, many years ago, which comes nearest to my idea of portability, in which two tubes slide one within the other, telescope fashion, and which combined with its portability the power of varying the distance of the stop from the lens. I have had several large single lenses remounted on this plan, and find it very useful.

Mr. A. Haddon called attention to another point that might easily be improved upon, namely, the position of the flange; this, however, is a question which will bear debating in connexion with the form of camera. If the lens could be attached to the camera so that no portion projected, certain advantages would accrue, to wit, the camera could be packed without unshipping the lens, and a single instantaneous shutter or sky shade would suffice for any number of lenses so fitted to the same camera. But on the other hand, the system of camera fronts would have to be altered, in order to permit the easy removal or change of lenses, as well as access to the diaphragms, while with some cameras I know the loss of available focal length would be a serious matter. I remember one such camera years ago, in which the lens was mounted inside, the revolving diaphragm plate being flush with the camera front, and covered by a hinged flap, which served for exposing as well as sky shade. It struck me as a very convenient arrangement.

Certainly the alteration of the position of the flange, as Mr. Haddon suggests, to somewhere near the diaphragm slot would be a great improvement in connexion with shutters and sky shades, but it would possess the countervailing disadvantages I have spoken of. But why not make the flange carry a short tube or jacket projecting into the camera, in which the body of the lens mount could slide? Why not, in fact, revert to the old "sliding tube" mount? It could be made quite as light as many of the rigid settings of the present day, and with a few other modifications far more portable.

That must have been a curious rainbow the photograph of which was exhibited and discussed at the same meeting. It is described as a "broad, shaded band, nearly straight, from top to bottom of the picture." The description certainly does not answer very closely to one's ordinary ideas of a rainbow; but I presume even rainbows have their vagaries, and those at the antipodes may differ in important respects from our own. Still it is rather "rough" on the artist to suggest that he had mistaken an intervening "rope or iron bar out of focus and near the camera" for a rainbow. This surpasses the feat of "seeing stars." But I should like to ask the gentlemen who "generally expressed" the rope-or-iron-bar opinion how broad the supposed representation of the rope would be if it were sharp enough or "fuzzy" enough to be taken for a rainbow, or how sharp it would be if its breadth were correct? In other words, is it possible to so photograph a rope or bar as to leave any doubt as to what it is?

The description speaks of the alleged rainbow as a "shaded" band, and certainly we should expect some such effect to be produced upon a sensitive film by a rainbow, but an intervening rope or bar would produce a clear band outlined against the sky. Finally, I scarcely think it possible that an intelligent individual could possibly make such an egregious blunder. That class of fool does not exist in nature, but is made in imagination.

Mr. Briginshaw's experience with similar bands upon paper negatives does not appear to have much connexion with rainbows, but it does suggest to me recollections of similar mysteries long unexplained, but extremely simple when the cause has been explained. A screw-hole crack or leak in the body of the camera, a loose piece of lining,

or a hundred similar accidents, have been known to puzzle an ordinarily "cute" individual for a long time. But a little mystery of my own is worth relating on account of a most singular coincidence that gave a supernatural tinge to the whole affair. In the old stereoscopic days I had undertaken to photograph the grave of a deceased friend in a suburban cemetery, and proceeded to carry out my promise, using my then favourite stereoscopic camera, one of $7\frac{1}{2} \times 4\frac{1}{2}$ dimensions. Upon developing the plate, all was right except a light blur immediately over the headstone and against a dark shrub in the background. A few days later I repeated the trial, making on this occasion two exposures, and my astonishment may be imagined when, on development, I found both the new pictures showed the same mark. The following day I paid another visit to the cemetery, taking with me a print from one of my negatives to compare with the surroundings, in the hope that I might find some explanation, possibly something to cause a reflection on to that part of the plate. The obtrusive mark, I should say, appeared only in one half of the negative, and always the same half. I examined the camera front carefully for holes, but as the phenomenon only appeared in the case of that subject, I was compelled to connect it with the subject.

On that visit I exposed six plates for purposes of experiment, and I cannot say I was surprised to find they all gave the same result. But I now began to fancy I could trace a resemblance between the ghostly blur and the top of an ornamental headstone, and, confident I had found a clue, I hurried off to the cemetery first thing next morning to make another examination, for I had now got thoroughly interested in the matter. After an inspection of the surroundings, sure enough I found, away to the right and behind the gravestone I had been taking, one the outline of which corresponded with my ghost, but I could conceive or invent no explanation of its presence in my picture, for it was far out of the field of view. I strolled up to close quarters to make a more minute comparison, when I was rather startled to find that the name on the stone was the same as on the one I was photographing, and a not very common name either. I am not superstitious, but I began to feel that I wished the defunct stranger had chosen some other agent than myself to bring about his introduction to possible relatives in his own immediate neighbourhood. I came to the conclusion I could not solve the mystery, made the best I could of the negatives I had taken, and in time forgot the matter except when I came across a print from my "ghost negative," as it came to be called.

Months after the explanation came. I was photographing a view with the same camera, and outlined against some dark foliage in one half of the picture I found a pond or piece of water that was located some yards to the right of the picture I was taking. My thoughts went back to the "ghost," and I commenced again to investigate, but with something more tangible to go upon, and the following was the result:—I had rejected the flexible division in the centre of my camera, and had substituted, for convenience sake in removing when I wished to take a single picture, a short rigid division of blackened metal fitting into a slot in the back frame of the camera. The lenses employed in taking my grave were of specially long focus for stereo work, employed in this instance because I had only one favourable point of view at some distance from the object. Using my ordinary lenses of $4\frac{1}{2} \times 6$ inches focus my short rigid division was all right, but when the camera was sufficiently extended for use with the longer lenses the marginal rays from the two lenses crossed in front of the division, and so reached the opposite compartments or divisions of the plate. In most ordinary subjects the double image thus formed was practically undetectable, but with a light object from one lens falling on a dark one from the other the effect was very noticeable, and these had been my conditions with the "ghost."

How to Manipulate the Camera in a Military Manner is a good sounding title, but after reading the article I want to know why Mr. Forrest didn't shorten it by calling it "How to Photograph like a Militiaman?"—it is just as *apropos*. Why "military" any more than "sporting?" Guns are used by sportsmen as well as military men. But I suppose Mr. Forrest, as a veteran and one who has to set an example to younger men, felt it would be wrong to seem to lead them astray by telling them how to use the camera in a "sporting" way, the word having a strong flavour of the betting ring about it. However, whatever the manner of using may be, the weapon is far from

new, as I saw a similar one—only that it was a “repeater”—in Messrs. Sands & Hunter's shop eight or nine years ago, and was informed that it was made for one of the Arctic Exploration Expeditions.

I see it mentioned by Mr. S. G. B. Wollaston that he had failed in obtaining sufficient density in the high lights when developing plates four years after exposure, implying that the lapse of time had something to do with the effect. It would be interesting to investigate this question in a serious and systematic manner, because the result, if really attributable to the cause implied, is the very reverse of what we might expect and what actually occurs with dry collodion plates. If the invisible image does suffer from time, naturally we should anticipate that the feeblest portions—the least exposed—would suffer first, but in Mr. Wollaston's case it is the reverse. Is it not possible that unconscious change in developing habits may have something to do with it? I have found myself that after developing a number of plates of a certain character—say such as give density easily—that I experience a difficulty in manipulating a different sort, with which, however, I may be perfectly familiar. Perhaps the four-year-old plates were of the less easily intensified kind. MONITOR.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

It may be best to confine ourselves for the moment to the treatment of an enlargement in *monochrome* before launching into the more difficult line of pure water-colour painting. The subject I would suggest is a half-length figure on a *carbon* basis. I select this because the majority of enlargements nowadays are done in this style, owing to its permanency. It does not matter as to whether the subject be male or female, as we will treat all the prominent points that can suggest themselves in either.

It is only natural to suppose that the head should receive our first and best attention. On the successful treatment of it will depend the final success of our work. It is impossible, therefore, to bestow too much attention while working upon this portion of our picture in order to reproduce *nature* as closely as our degree of skill will allow.

One of the most extraordinary things in nature is the human head. It is really most marvellous (when we think of it) the endless varieties of form and expression which it is capable of representing. Then the face is only one half of the head, and yet an unceasing variety is observable in every one we may meet in a day's journey through life. Of course the face, or front of the head, is the more important part, yet, on close study, there will be found to be a vast amount of distinct individuality in the back view of the head. Now this individuality is a matter of the greatest importance to all portraits, and should arrest our first thoughts on beginning work. To preserve it carefully is absolutely essential to success. We may almost say there are no two *faces* alike. I think we may unhesitatingly say *no two heads* are alike. As a result of a fairly extended experience, I have found where there has been an almost phenomenal likeness between two *faces*, a moment's study of the formation of the *head*, as an entire, will disclose the most observable differences, which, on further consideration, will so impress you that you will wonder that you should ever have considered the people so much alike. Such is individuality, and you can easily see, therefore, the necessity for its due preservative. Our treatment, therefore, should vary according to the subject we are about working upon. It must naturally suggest itself as very foolish to treat an old man's or old lady's head as you would a baby's or little girl's, nevertheless there are many who do so. Of course such treatment is only of the wax-doll school, which means simply “fining up,” or working out, the blemishes, producing generally a smooth surface, but leaving the whole, in result, devoid of character, and, as a necessary consequence, lifeless and uninteresting.

We will start now with the *forehead*. Breadth is always desirable in this feature, hence we should keep our touches as broad and bold as we can, and when they have a marked tendency in any direction, they should incline to the horizontal, as such treatment tends to give massiveness to the brow. If we let them incline to the perpendicular, *narrowness* will be the result. The modelling or any half tone denoting *shape* in the forehead should be most carefully preserved, as

the intellect of the original may be considerably represented by it. There is nothing, to my mind, which adds so much to a portrait as *shape*. Its absence in the portrait of a man of brains is absolutely fatal. When using the colour do not take up too much at a time in the brush, and do not let it be too liquid either. Keep it delicate in tone, and arrive at depth of colour rather by *repeating* than by strength in the first application. The result will be softer, and the effect less likely to be exaggerated.

In most carbon prints a grey tone will be observed to pervade the entire picture, thus necessitating the putting in of all the high lights. For the securing of these latter we should use an eraser. With this we proceed, after having put a point on it, to pick out the lights wherever they may appear necessary. The forehead, for example, over the eyebrows, down the nose; the eye, too, may require clearing and the strength of the *crow's-feet* may require reducing; the cheek-bone, too, also the chin and neck, and so on. It is a great advantage that in “working up” on carbon base all offensive shadows can be lightened so as to harmonise with the general tone of the picture. Were it not for this, there are many pictures which would be almost, if not quite, impossible to “work up,” as from their *hardness* it would be useless trying to arrive at softness or harmony, which, of course, are essential to a good result.

The eye will be the next feature, as we work down the head; but I think, personally, that although a certain amount should be done to it *now*, it should *not* be finished until the rest of the portrait is complete. When this is so, it will be found that the judicious adding of perhaps a little force or other effect may crown the success of the picture. In working this feature constant reference to the duplicate or guide should be made, which should to a great extent determine the depth of tone that you can work to. The pupil will, of course, want strengthening, and this must be accomplished with a few sure but delicate touches and keeping strictly to the form. The high lights, as a rule, in enlargements become very considerably exaggerated, and will therefore demand our attention; should the light therein not be sufficient, rub away the film with the eraser until a white surface comes through. If, however, you think a still higher light would improve the portrait after you have worked the eye with the photographic colour to its desired condition, a little Chinese white (Winsor & Newton's) upon the point of the brush may be advantageously used. Great care should be taken to avoid a *glare*, as it would deprive the eye of all semblance to nature. I have advised the use of a special Chinese white; I have lately made some experiments with several others, and have come to the conclusion that Winsor & Newton's is the best and most reliable. There is also a *reflected* light opposite the high light; care must be taken to keep them in proper relation or balance one to the other. The iris will in most cases require defining somewhat; this should be done by very faintly outlining it. Do not use a heavy colour for this, but rather arrive at the requisite depth by repetition of touch. One can spoil a big picture in a few moments, but even a small one must be worked slowly if destined to become a good or beautiful work.

A few faint touches, carefully placed to indicate the lashes of the upper lid, will do much to enhance the beauty of the eye. These touches must, however, be placed with great care; they must not be *vairy*, nor such as might give the idea of trying to represent each individual hair, but rather to express their presence by a soft shadow. These latter remarks apply equally to the treatment of the eyebrows, the strength of which may be determined by the guide. The definition of the eyebrows, and often the markings of the upper lid, will require carrying out; that is, they seem to terminate harshly and abruptly, and will therefore require our help to give them their natural appearance. There are many causes for these defects and cannot always be avoided. By reference to the guide, however, there will not be much trouble in setting them right. Of course we desire a certain degree of finish as well as effect in all our pictures, but we should be ever mindful that in portraiture the beginning and end of everything is *likeness*. The lines lying underneath the lower lid will be invariably found to require softening. This process of softening must never be carried too far, or the expression of the eye will be greatly diminished in force, if not altogether destroyed. It would be well, therefore, to soften these objectionable lines with an eraser and then work up the whole to a pleasing and satisfactory extent.

* Continued from page 647.

The nose will be our next trouble. It is a prominent feature, and one that has much to do with the success of a picture as a portrait. Too much care cannot be expended on securing the high light. Faultiness in this regard will be fatal to the portrait. The slightest deviation from its proper place or its correct form may entirely alter the character of the feature. The cavities of the nostrils will sometimes require a few dark touches to give them sufficient vigour, but on no account must they be made too dark, or have the appearance of being too plainly outlined. The nostril itself should be very delicately rounded and the cast shadow strengthened, but never made *too* dark. In all this work we should strive to make the whole resemble as nearly as possible the appearance of a good photograph, neither lines or touches plainly visible, but all blended softly together in a harmonious whole.

We next come to the mouth. A great deal depends upon the successful treatment of this important feature. Its importance varies considerably; in some it is of but slight importance, but with others it is all important. It will be well to secure a high light, with the eraser, on the lower lip; then the diffused and shapeless light there will have to be reduced into proper dimensions by careful work. If there are any harsh lights or offensive markings of any kind on the lips, they being the result of the skin being dry or cracked, they should all be softened away. Many times, but not always, the markings and separations of the lips will require a little touch to give them sufficient force. The shadows or markings running from the corners of the mouth will often offer a favourable chance for a little skilful treatment. We must always try, as much as possible, to raise the muscles of the face, and must, therefore, try to accentuate the upward curves, and soften, if we cannot safely obliterate, the downward ones. Near the centre of the upper lip there is generally a delicate light—sometimes it is very faint, indeed—but should always be preserved, as it is just sufficient to give life and expression to the entire mouth. The shadow formed under the lower lip should be softened and made to melt into the chin.

The lines running from the side of the nose in a downward direction are generally rather strongly marked; they must, therefore, be duly softened, and, when necessary, the muscle raised. In doing this, consult your guide, lest you might be tempted to go too far. In the majority of cases, it is not *altering* that is demanded, but simply *softening*.

The treatment of the frontal depression at the root of the nose should always receive due care. The furrows may be very considerably softened, but it may be ruin to take them away. These furrows are more usual in gentlemen's portraits, and will generally bear softening. They seldom enhance the beauty of the picture, so there is little danger of getting into trouble, even if you soften them too much. The frontal eminences above the eyebrows merit careful treatment, and care should be taken that the high lights on the forehead should not approach too high or near the hair. The cheek-bone should never be left too strongly marked, but worked into the cheek, the highest point of its light being under the eye.

Some look upon the chin as an easy matter, but care should be bestowed upon it; it is easily treated, but may be very easily spoiled. There is much character in this feature, and it should be preserved where necessary. Feebleness or strength of character may be greatly represented by this feature.

REDMOND BARRETT.

(To be continued.)

ON THINGS IN GENERAL.

FROM all appearances, photographic work with the microscope—how I do hate that cacophonous title “photo-micrography”—is likely to be well practised during the forthcoming winter, and very useful and very beautiful are some of the results capable of being achieved in this direction. It is surprising how much good work of this kind can be done with the slightest of added apparatus; but so much depends upon the possession of a due admixture of photographic and microscopic experience in those attempting this class of photographic work. A man may be an excellent photographer, and yet have not the slightest idea what, or how, he ought to see when certain objects are put before him; and as to being able to exhibit anything definite at all, when high powers and test-

objects are in question, it would be simply impossible with a man inexperienced in microscopic manipulation. Hence, to expect that such an one, expert though he might be in photography, could sit down to a microscope, and, with or without extra apparatus, produce a first-class negative, or even a presentable one, of a fairly difficult object, for the scrutiny of microscopists, would be simply idle. To produce really important work this way, either two workers, each knowing his own department well, must combine their forces, or, single-handed, the photo-micrographist must be equally clever with camera and microscope. Now I will give one little piece of valuable advice to those who know a little of the latter and much of the former, and desire to combine their knowledge and endeavour to compete with old hands at the work. It is this: Whatever (mounted) object is attempted to be enlarged let the utmost pains be taken to see that the particular slide utilised be the very best of its sort it is possible to obtain. It is not enough to go to a first-rate mounter or dealer and pay the ordinary price for the average slide; a number must be carefully selected and compared, and one chosen containing the characteristic points in the highest perfection. One man may spend a whole week, for example, in trying to get the best possible negative of such a simple object as a blowfly's tongue, and yet egregiously fail in comparison with another who possesses a choice slide of the same subject, and takes, perhaps, a single negative only from it. I note that at one of the Society's meetings the Chairman is reported to have stated that there were occasions when absolute coincidence between the position of the front of the focussing screen and the sensitive surface were essential. There can be no doubt that such coincidence is desirable; but he would be a clever photographer who would be able to detect which of two negatives was taken at the so-called correct focus, and which at a sixteenth or even an eighth of an inch on one or the other side of it, when the scale of enlargement is large. Polemical matter apart, there can be no doubt as to the high quality of this work shown at the Exhibition in Pall Mall.

If any particular remark about the present set of pictures at Pall Mall may be here made, it is that they are striking from the good average of quality shown. There are, indeed, none of those glaring atrocities which never should have been hung, but which have disfigured previous Exhibitions, and almost the hangers.

The question of large heads direct *versus* enlarged, is pointedly raised by this present show. There are some direct heads, notably Müller's prize picture, which exhibit artistic feeling and veracious delineation in a high degree, but again there are large heads which are simply hideous vulgarities and examples of what to avoid. No doubt the larger the cameras and the more expensive the lenses the more the professional photographer is likely to handicap the average amateur in any competition the former may imagine himself to be subjected to, but that is not the correct standpoint to view the matter from. Direct life-size heads must be viewed first by results, and secondly by facility in obtaining the results. Granted two processes of greatly varying simplicity in their operation, and producing absolutely equal results, it is incontestable that the palm should be awarded to the least difficult. So it is with the subject under discussion. So far direct pictures are a long way the best of the two, but that is not to say that such will always be the case. I hold that the man who can invent a process of enlarging or perfect his own practice of ordinary modes in such a way as to enable him to produce pictures in which a shadow of difference in definition is the only point that distinguishes them from direct photographs is for more worthy of praise than the one who overcomes other difficulties, and takes beautiful photographs with a big camera.

Mr. Lyonel Clark, in his paper on the selection of lenses, advised his hearers that it was important that they should take great care of their lenses. A very useful and still needed piece of advice. It is most remarkable how careless some photographers are of valuable lenses. I have come across men who, as a simple matter-of-course, would slip an uncapped small lens in their pocket and travel about all day without protecting it, oblivious of dust, scratches, abrasions of the lacquer, and other possible and probable injuries it might sustain.

Mr. Dunmore's remarks upon the sizes of prints, in his article upon print trimming, are well worthy of perusal. “*Quantitas non qualitas* is a bad motto,” he says, and, further, “many really good pictures are damaged by this anxiety to have as much as possible of the subject

as can be made out of the negative. I advise that all the worthless parts of the print should be ruthlessly trimmed off, as it is better to sacrifice part than the whole." True, Mr. Dunmore. But it is too sadly true, also, that, so far as regards the pictures, the popular views, sold to the public, this advice is useless. Such pictures were sold by the yard: get a certain number of square inches for a certain small price, and the dealers would not be able to stand competition if they did not give their full quantum of picture, artistic or not. Mr. Adcock's remarks at the Camera Club on the subject of the most suitable proportions for dry plates have a somewhat similar bearing, and as some of the most popular selling sizes would fall in better with oblong plates, perhaps a consideration of the fact may lead the plate makers to take sizes into their consideration.

Mr. Palmer's suggestion that dry-plate makers should be made responsible for their sins may ultimately be realised; but I am afraid that the time is far distant when this will happen, they still form a rather close corporation, and sit upon the poor photographer as they like. It is not to be denied they are subject to all sorts of claims and complaints which are worse than groundless, but, granting that, there seems to be an opinion abroad among them to the effect that "we do our best, and if the plates do happen to be defective you really cannot blame us." It is a very unlikely thing, however, that a Belgian maker should be rendered amenable to an action for damages as proposed by Mr. Palmer.

A correspondent asks about the capabilities of using a speaking-tube a hundred feet long; he may rest perfectly satisfied of being quite safe in using one much longer than that. I have seen one in a photographer's premises a greater length than a hundred feet; it was, however, objected to by the lady in the reception room. Her objections were not founded on its inefficiency, but rather its too great efficiency; for, directly after it was put up, this lady, who was a Blue Ribbonite, said she did not like it because she could distinctly smell drink whenever the operator, who, though steady, was not of that persuasion, spoke through the tube.

FREE LANCER.

WRITING AND DRAWING ON GLASS.

V.

Converting a Drawing on Clear Glass into a Negative.—The process of etching a negative on an opaque black ground is one that demands of the artist special skill, of a similar nature to that possessed by retouchers of portrait negatives. The deepest shadows of the design must be represented on the negative by an approach to clear glass, while the high lights are produced by simply leaving the film with its original opacity. This constitutes a serious drawback to the etching system, as it requires a special training to ensure the highest class of work, and most artists would prefer to make a line drawing on paper first, and to produce the negative from that sketch by the use of the camera. Photographing a pen-and-ink sketch on paper, however, is rarely so successful as to result in a print indistinguishable from the original; there is generally a slight haze over the print, and the finer lines are sometimes lost altogether in the reproduction.

The copying of maps, &c., by photography is consequently entrusted to those who make a speciality of such work, as the methods employed in portrait studios do not usually yield the class of negatives required for line subjects, the characteristics of which should be perfect opacity of the ground, and complete transparency of the lines.

While coating some glasses with an opaque film in the manner described in the latter end of the preceding chapter (see page 662), in which a layer of gum dammar is used to absorb the carbon deposited thereon by a smoky lamp, I found that a simple modification of the process enabled better results to be obtained, and did away with the difficulty previously referred to of etching on a black ground. I have ventured to apply the term "novel" to this method, on the strength of not having hitherto seen anything of the kind published. The plan is a very simple one, however, and I am aware that there is nothing new under the sun; but if not altogether original, it may be at any rate worth describing. The manipulation is easy, and the result is a negative possessing the desired qualities of clear lines on an opaque ground, without any tendency for the finest lines to become obliterated. It is, in short, the conversion of a

pen-and-ink sketch on glass into a negative having a decidedly "permanent" nature, its opacity being due to carbon, the king of black pigments.

It seems well within the bounds of possibility that some such method as this, conjoined with photography, may enable a new system of producing positive prints in "permanent carbon" to be worked, in which the hand-drawn sketch shall be replaced with one due to the actinism of light.

Here is the process as I have hitherto practised it:—A clean glass, of quarter or half-plate size, is coated with a varnish composed of gum dammar dissolved in ether. This is applied without heat in the first instance, but as soon as the ether has evaporated, warmth may be used to complete the drying. If the film does not absorb sufficient carbon when held in the lamp flame to produce opacity, it indicates that the varnish is too weak, and that more gum must be added—this adjustment is by no means a difficult matter. As soon as the solution is of the right strength, it may be filtered to free it from small particles of dust. When the dammar film is quite dry on the glass, we must not allow any dirt to settle on it, and should avoid touching the surface as carefully as if we were working the wet collodion process. Every grain of dust and every impression of the finger will cause corresponding defects in the negative, and will be faithfully represented as pinholes and the like on the opaque ground. This delicacy of the system constitutes at once its weakness and its strength—the latter, because we owe to it the certainty of the finest strokes of a pen being fully indicated in the negative.

A retouching desk may be used to support the glass at an angle of 45°, and a sheet of white paper placed horizontally behind it will enable us to see the progress of the work.

If a piece of ground or flashed opal glass is placed behind and in contact with the prepared plate, we shall be able to sketch away with as much freedom as if we were working on paper. The ink we are to use may be any of those described in the preceding article of this series, but preference can be given to the one prepared with lamp-black and sugar. The sugar should on no account be omitted, as it is the acting agent in the subsequent process of smoking the plate; it prevents the dammar from absorbing the soot in those places where it lies in the form of pen strokes. The sugar alone would serve as the ink if dissolved in water; but as it is necessary for the artist to see his work as it progresses, a little lampblack is added to the syrup to give it the required depth of colour.

The drawing should be reversed on the glass; what is intended to be on the right side of the subsequent print should be drawn on the left side of the plate. This constitutes a difficulty in the case of manuscript, such as a written letter or circular, few people being adepts in the art of writing backwards. So we may write on note paper in the first place with our special ink, to which a very little treacle or glycerine is added to leave the inscription in a slightly tacky condition. This paper is then pressed on the dammar film, so that a portion of the syrupy ink is transferred in a reversed form to the glass. It does not matter how little of the ink adheres so long as there is some trace of it left on the film.

Having completed our sketch or writing on the prepared glass, we may next proceed with the smoking—but not with tobacco. The simplest way is to use a benzoline sponge lamp, which answers very well for small work. For glasses larger than the half-plate size, however, there would be considerable risk of fracture if they were held in a small flame—for such plates a special apparatus may be made. We require a current of hot air, mixed largely with smoke and vapour of benzoline; this might be produced by fixing a metal tube or chimney over the lamp, with an arrangement for cutting off the draught similar to a Bunsen burner. The wick being well turned up we should have the soot rising mainly in the centre of the tube, hence diaphragms or deflectors may be inserted above the flame, so as to divide the smoke and mix it with the surrounding air as it ascends the chimney.

If the vapour of benzoline is insufficient in quantity the soot will not be absorbed by the film, but will settle on it in the loose dry condition it assumes on plain glass. The surface of the film, when smoked to opacity, should be bright, and it should bear being dusted with a cloth. In those places where the sugar lies in the form of ink lines, the film is protected from the soot, which does not sink in, and

can therefore be wiped off with a cloth afterwards, leaving the lines visible on the darker ground.

The last operation, which may be called the development, is to immerse the plate in cold water for a few minutes. This dissolves the sugary ink, and by the aid of gentle friction with a brush, or the finger end, every trace of it can be removed, carrying away, of course, the soot which had settled thereon. The lines will now be perfectly clear and transparent, while the ground, being unaffected by the washing process, remains as opaque as before. Extremely fine lines may require a longer soaking than the thicker lines, but I have never found them to become blocked up with the lampblack.

After the development, the plate may be dried; it scarcely needs varnishing, as the dammar film is a varnish in itself. Should any additional protection be desired, the plate might be dipped in a weak gelatine solution, and, when this sizing is dry, coated with shellac varnish.

The process can be applied to various uses besides the one we have been considering; coloured designs can be "blackened in" as lantern slides with an accuracy that handwork cannot compare with, while grey and shaded backgrounds can be likewise produced.

ALBERT WM. SCOTT.

ON THE IMPROVEMENT OF OVER-EXPOSED NEGATIVES.

[A Communication to the Photographic Club.]

ACCORDING to promise, I will now tell you of the very simple plan I have adopted for rescuing weak, over-exposed negatives from the waste—a process so simple that I hesitated to say anything about it until I had made inquiries if this or any other plan had been successfully adopted for the purpose, or if, on the contrary, the greater portion of such defective negatives were considered irremediable failures and looked upon as worthless, from a printer's point of view, at any rate. The only way of getting any passable result from a thin, over-exposed plate (if it was considered worth the trouble) was by making a transparency and copying that, a roundabout process, you must admit, if the original negative can be so altered and improved as to do away with the necessity of reproduction.

The process I am about to recommend is free from difficulty, being little else than already well-known processes somewhat differently applied; it is in fact so simple that one is forcibly reminded of the incident of Columbus and the egg. Negatives which by this plan can be satisfactorily treated are *over-exposed* ones, of which a goodly number are, no doubt, in existence, but a plate *chemically fogged*, or one to which the light has had access *before* exposure, would probably not be amenable to this treatment; however, I have not made any experiments to verify the opinion. Some improvement possibly might be made, but as to making a perfect negative of such, it is extremely doubtful, whereas in the case of over exposure it is an undoubted panacea.

If an ordinary over-exposed negative is intensified by any known method, it *may* be somewhat improved, but, at the same time, the deposit in the shadows will gain in strength, as well as the lights, and the result will be a very dense, slow-printing negative, and one from which perfect results are unlikely to be obtained, although somewhat better than the original before intensification. The effect of over exposure is, we all know, to gradually obliterate the image until a point is reached when a reversal of it takes place and the negative becomes a positive. It must be clearly understood I refer to the ordinary methods of development. In the development of a properly exposed plate, the reduction is first on the outer surface of the film, into which it gradually extends until the most reduced parts are visible at the back of the plate. If the development is continued for too long a time the portions much less acted upon by the light begin to show at the back also, and the resulting negative is too dense; this, however, depends in a measure on the thickness of the film. A proper development is one that gives sufficient density to the high lights without blocking up the shadows. The negative image in the gelatine film may be looked upon as a series of images in different strata overlying each other, the strongest lights penetrating lowest and deepest, the deepest shadows passing scarcely beyond the surface, and sometimes not so much as appearing to affect it at all. It therefore seems that the thickest films most rich in silver salt should give the strongest image with ordinary development; on the contrary, with a thin, poor film it is difficult to get a good, rich printing image with clear shadows, and the chances of blurring and halation are greatly increased.

Given, then, an average good plate and over exposure, my idea

is to remove the outer layers sufficiently deep to leave clear glass in the *deepest* shadows, and then intensify the remainder. The way of setting about it, and which I have found answers perfectly, is the following. Other plans, doubtless, might be adopted to effect the same result, but as the one I tried fully answered my expectations, I thought further search unnecessary. The appliances required are few and simple, being limited to a white dish and a lamp. A solution of five grains of hyposulphite of soda to the ounce of water in one receptacle, and a solution of the same strength of ferricyanide or red prussiate of potash in another, with plenty of clean water at hand, being ready, the negative to be operated on must first be carefully examined, and some part that we know should be nearly, if not quite, clear glass specially noted, as this will form the key to the reduction. The negative is now laid face uppermost in the white dish, the lamp being arranged to throw as good a light as possible on it. The hypo and ferricyanide solutions being mixed together are poured over it, the dish being gently rocked, and the process of reduction, which soon sets in, intently watched, and as soon as the portions noted at the beginning as the deepest shadows permit the white of the dish to shine through, remove the negative and immediately well wash it. It is best to stop a little short of the full effect desired, for the action will continue a little after removal from the solutions. A bit of white paper pressed against the back of the negative will aid in deciding if the reduction has been carried far enough; if not, it may be redipped until it has. Now well wash. Soak for an hour in several changes of water, and dry now if on a thorough examination the reduction has been considered right. Intensification may be proceeded with, according to Dr. Monckhoven's plan, with bichloride of mercury and cyanide of silver modified in this manner. The bichloride of mercury solution should be a cold, saturated solution at a temperature of 60°; to one ounce of this add twenty grains of bromide of potassium. Let the negative, now very ghostlike, remain in this until it is quite whitened throughout; remove and well wash, and then place it in the cyanide of silver solution, of double the usual strength, until the white image is replaced by a black one. Wash well, and the process is completed. If it is found insufficiently intensified, this process may be repeated, washing and drying between the repetitions. You will see there is nothing new in the use of either Mr. Howard Farmer's reducing or Monckhoven's intensifying plans, the novelty rests in the application of them.

There are, undoubtedly, thousands of negatives thrown aside as useless on account of over exposure, that will afford the useful and pleasant occupation of metamorphosing into good ones during the long evenings of the coming winter—it being essentially a process suited for artificial light—and the pleasure of seeing a negative given up as hopeless bloom into one without reproach may fairly divide the honours with making transparencies for microscopes or lantern slides, which are about the only photographic operations the majority of photographers can satisfactorily pursue during the gloomy winter season.

EDWARD DUNMORE.

SOME NOTES ON THE HISTORY OF THE DISCOVERY OF THE GELATINO-BROMIDE PROCESS.*

AND now we come to the work of the practical inventor of the gelatino-bromide of silver process—Dr. Richard Leach Maddox.† I should like to ask the Editor to reprint the original communication which laid the foundation of all our work of to-day, for the back volumes of THE BRITISH JOURNAL OF PHOTOGRAPHY are scarce, and complete sets fetch by auction between twenty and thirty guineas!

"AN EXPERIMENT WITH GELATINO-BROMIDE.‡

"The collodio-bromide processes have for some time held a considerable place in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY, and obtained such a prominent chance of being eventually the process of the day in the dry way, that a few remarks upon the application of another medium may perhaps not be uninteresting to the readers of the JOURNAL, though little more can be stated than the result of somewhat careless experiments tried at first on an exceedingly dull afternoon. It is not for a moment supposed to be new, for the chances of novelty in photography are small, seeing the legion of ardent workers and the ground already trodden by its devotees, so that for outsiders little remains except to take the result of labours so industriously and largely circulated through these pages and be thankful.

"Gelatine, which forms the medium of so many printing processes, and which, doubtless, is yet to form the base of many more, was tried in the place of collodion in this manner:—Thirty grains of Nelson's gelatine

* Continued from page 665.

† Born at Bath, August 4, 1816. May he live to be as old as Chevreul!

‡ From THE BRITISH JOURNAL OF PHOTOGRAPHY, September 8, 1871.

were washed in cold water, then left to swell for several hours, when all the water was poured off and the gelatine set in a wide-mouthed bottle, with the addition of four drachms of pure water and two small drops of *aqua regia*, and then placed in a basin of hot water for solution. Eight grains of bromide of cadmium dissolved in half a drachm of pure water were now added, and the solution stirred gently; fifteen grains of nitrate of silver were next dissolved in half a drachm of water in a test-tube and the whole taken into the dark room, when the latter was added to the former slowly, stirring the mixture the whole time. This gave a fine milky emulsion, and was left for a little while to settle. A few plates of glass well cleaned were next levelled on a metal plate put over a small lamp; they were, when fully warmed, coated by the emulsion spread to the edges by a glass rod, then returned to their places and left to dry. When dry, the plates had a thin, opalescent appearance, and the deposit of bromide seemed to be very evenly spread in the substance of the substratum.

"These plates were printed from in succession from different negatives, one of which had been taken years since on albumen with ox-gall and diluted phosphoric acid, sensitised in an acid nitrate bath, and developed with pyrogallie acid, furnishing a beautiful warm brown tint.

"The exposure varied from the first plate thirty seconds to a minute and a half, as the light was very poor. No vestige of an outline appeared on removal from the printing frame. The plates were dipped in water to wet the surface, and over them was poured a plain solution of pyrogallie acid, four grains to the ounce of water. Soon a faint but clear image was seen, which gradually intensified up to a certain point, then browned all over; hence the development in the others was stopped at an early stage, the plate washed and the development continued with fresh pyro, with one drop of a ten-grain solution of nitrate of silver, then re-washed and cleared by a solution of hyposulphite of soda.

"The resulting prints were very delicate in detail, of a colour varying between a bistre and olive tint, and after washing dried with a brilliant surface. The colour of the print varied greatly, according to the exposure. From the colour and delicacy it struck me that with care to strain the gelatine or use only the clearest portion, such a process might be utilised for transparencies for the lantern, and the sensitive plates be readily prepared.

"Some plates were fumed with ammonia; these fogged under the pyro solution. The proportions set down were only taken at random, and are certainly not as sensitive as might be procured under trials. The remaining emulsion was left shut up in a box in the dark room and tried on the third day after preparation; but the sensibility had, it seems, greatly diminished, though the emulsion, when rendered fluid by gently warming, appeared creamy and the bromide thoroughly suspended. Some of this was now applied to some pieces of paper by means of a glass rod, and hung up to surface dry, then dried fully on the warmed level plate and treated as sensitised paper.

"One kind of paper that evidently was largely adulterated by some earthy base dried without any brilliancy, but gave, under exposure of a negative for thirty seconds, very nicely-toned prints when developed with a weak solution of pyro, having very much the look of a neutral-toned carbon print without any glaze, and I think might be rendered useful on plain paper. Some old albumenised paper of Marion's was tried, the emulsion being poured both on the albumen side and, in other pieces, on the plain side, but the salting evidently greatly interfered, the resulting prints being dirty-looking and greyed all over.

"These papers, fumed with ammonia, turned grey under development. They printed very slowly, even in strong sunlight, and were none of them left long enough to develop into a full print. After washing they were cleared by weak hypo solution. It is very possible the iron developer may be employed for the glass prints, provided the usual acidification does not render the gelatine soft under development.

"The slowness may depend in part on the proportions of bromide and nitrate not being correctly balanced, especially as the ordinary, not the anhydrous, bromide was used, and on the quantities being too small for the proportion of gelatine. Whether the plate would be more sensitive if used when only surface dry is a question of experiment; also, whether other bromides than the one tried may not prove more advantageous in the presence of the neutral salt resulting from the decomposition, or the omission or decrease of the quantity of *aqua regia*. Very probably, also, the development by gallic acid and acetate of lead developer may furnish better results than the plain pyro.

"As there will be no chance of my being able to continue these experiments, they are placed in their crude state before the readers of the *JOURNAL*, and may eventually receive correction and improvement under abler hands. So far as can be judged, the process seems quite worth more carefully conducted experiments, and, if found advantageous, adds another handle to the photographer's wheel. R. L. MADDOX, M.D."

The editorial remarks (in the same number) were as follows, and show a full appreciation of the new method. It must be understood that Dr. Maddox's communication was accompanied by specimens of his results.

"The interesting experiments of Dr. R. L. Maddox on gelatino-bromide emulsion—the notes of which will be found in another column—will probably have the effect of turning attention to a comparatively neglected field for experiment with emulsion processes. Dr. Maddox uses a

gelatine collodion—if we may use the term—and in this suspends the finely-divided bromide of silver precipitate. The emulsion likewise contained an excess of nitrate of silver and a small proportion of *aqua regia*—the latter not being present, however in sufficient quantity to reduce the nitrate of silver very near to the neutral point. Plates coated with the emulsion, and the film dried, printed under a negative with tolerable rapidity, the image being invisible at first, but well brought out by plain pyrogallie acid. The necessary density was obtained by treatment with fresh pyrogallie acid, and the addition of a little nitrate of silver solution. Dr. Maddox used all his films in the dry condition, the gelatine in this case acting the part of the organifier or preservative, and sealing up the sensitive silver compound most effectually—in fact, more completely than ordinary collodion. We thus appear to have another 'driest-of-the-dry processes' at our disposal, capable of yielding plates superior in sensitiveness to those afforded by the different mode of operating referred to in another place. We venture to hope that some of our readers who may have time for experimenting in this direction will take up the line of work which Dr. Maddox has now relinquished, and, starting with the object of combining organifier and supporting layer in one, be able to work out a process even more convenient than any we possess already. Saving of time and labour must always be considered in photographic work, and the use of the gelatine layer gives some promise of success in the production of sensitive plates without the washing and preservative coating at present necessary."

W. JEROME HARRISON, F.G.S.
(To be continued.)

THIRD ANNUAL INTERNATIONAL AMATEUR PHOTOGRAPHIC EXHIBITION, 1887.

AWARDS.

Class I.—10l., Harry Tolley; Silver Medal, Surgeon-Major Mantell; Bronze Medal, George Davison; Bronze Medal, Miss E. Graham Stone; Bronze Medal, Frank Cooper; Commended, Messrs. A. James, S. Bourne, and Hood Daniel.

Class II.—(a) Silver Medal, Captain C. M. Harrison; Bronze Medal, W. Gaddum; *(b)* Bronze Medal, H. Harvey-George; Bronze Medal, O. S. Foster; Commended, Messrs. K. Kryzanowski and John Leisk.

Class III.—5l., Lieut. R. B. Croft, R.N.; Silver Medal, J. T. Hopwood; Bronze Medal, A. James; Bronze Medal, David Lewis; Bronze Medal (extra), Sir Robert G. Harvey and Miss F. Harvey; Commended, Messrs. Francis F'rench Davis and Captain Brown.

*Class IV.—*Silver Medal, Rev. F. C. Lambert; Bronze Medal, Dr. E. W. Alabone; Bronze Medal, The Countess Oriola; Commended, Mr. Greensill Allen.

*Class V.—*Gold Medal, Howard J. Kennard; Silver Medal, J. T. Hopwood; Bronze Medal, Dr. Gray; Bronze Medal, Miss Miles; Bronze Medal (extra), Lieut. R. B. Croft; Commended, Mrs. West.

Class VI.—5l., Ed. A. Gollidge; Silver Medal, David R. Clark; Bronze Medal, H. Harvey-George; Commended, Messrs. H. J. Turney and Edward Pritchard.

Class VII.—5l., Miss C. Wrigley; Silver Medal, Miss Sullivan; Bronze Medal, Miss Florence Harvey; Commended, Miss Joyce Croft and Mrs. Edward Penton.

Class VIII.—10l., George Davison; Gold Medal (withheld); Silver Medal, C. S. Roe; Silver Medal, H. Tolly (for *On the Lonely Shore*); Silver Medal (extra), Miss Miles; Bronze Medal, H. Manfield; Bronze Medal, W. H. Banks; Bronze Medal, Rev. H. B. Haro; Commended, Messrs. A. Clarke, H. Harvey-George, and Mr. Brian Hodgson.

Class IX.—10l. (withheld); Silver Medal, (Surgeon F. N. Puddicombe; Silver Medal (extra), Dr. Longfield; Bronze Medal, Col. L. D. Mackinnon; Bronze Medal, Col. Hooper; Bronze Medal (extra), Lieut. R. C. Tyllier-Blunt; Commended, Capt. W. A. Moss.

*Class X.—*Silver Medal, Cyril S. Cobb; Bronze Medal, G. Herklots Vos; Bronze Medal, C. C. Hughes D'Aeth.

*Class XI.—*Silver Medal, G. W. Catt; Silver Medal (withheld); Bronze Medal, Dr. W. Gray; Bronze Medal, F. L. Cox.

*Class XII.—*Silver Medal, W. L. Carpenter; Bronze Medal, S. F. Clarke; Bronze Medal (withheld).

Class XIII.—5l. (withheld); Silver Medal, W. L. Carpenter; Bronze Medal, Miss E. Graham Stone; Bronze Medal, A. J. Barnes.

*Class XIV.—*Gold Medal, J. T. Hopwood; Silver Medal, W. Adeock (for silver print); Bronze medal, H. Manfield; Bronze Medal, J. E. Dumont.

NOTES FROM ABROAD.

(From our Special Correspondent.)

II.

THE ROYAL OBSERVATORY AT BRUSSELS.

BEFORE leaving England on a few weeks' tour in Belgium, Germany, and Holland, I came upon some information collected for these pages during a previous visit to Belgium, and afterwards mislaid, so now clear out those particulars before dealing with more recent experiences.

Since the Royal Observatory at Brussels was erected, and fitted up for the most part with optical and chronometric apparatus bought in England, the then adjacent city has extended itself in all directions, until the Observatory now finds itself within town limits, an unfavourable position for any such establishment because of the unequal refraction of the atmosphere, due to hot air and gases rising from the chimneys of the houses, and because of the smoke. The latter, however, is not so thick as in England, because fuel on the Continent generally is burnt in a more scientific manner, and allowed but in a relatively small degree to escape as smoke to pollute the air, and to lengthen photographic exposures in the winter or other seasons. A new Observatory is in course of erection a few miles out of Brussels, and in due time to it the national astronomical work will be removed.

In the Brussels Observatory magnetic phenomena are recorded automatically by the aid of photography, as at Kew, so the method requires no description here. One of the officials has taken astronomical photographs by means of the great equatorial on the premises, and in this matter there is also nothing scientifically new. The recording of the readings of most of the meteorological instruments is not, as usual in England, done by photography, but by the celebrated meteorograph invented by Messrs. Van Rysselberghe and Schubart, by means of which the indications of the barometer, thermometer, and several other instruments are automatically recorded every ten minutes, in such a way, that after merely etching the record any number of copies can be printed off from it in the press. This is done by coating a thin sheet of brass or copper with a medium which resists the action of acids, and then fixing the prepared sheet round a drum, which gives one revolution every ten minutes. By means of an armature and electro-magnet, a diamond point is brought down upon the acid-resisting coating at intervals related to the indications of the various meteorological instruments, this being effected in them by means of make-and-break contacts; thus by means of a single frequently broken line upon the drum, the indications of all the instruments are recorded every ten minutes. When the metallic sheet is full of records it is taken off and etched, and a fresh sheet is put in its place.

In these operations are some which may be of practical use in photography, because in various photo-engraving processes it is necessary that the metal shall be covered with some tough acid-resisting medium, which shall not splinter under the action of the graver's tool, yet shall give clean lines. In Van Rysselberghe's meteorograph, it is necessary that this medium should as nearly as possible reach perfection, because any fault in it would cancel valuable records, so how it is made will now be set forth.

The metallic sheet is first well polished and cleaned, care being taken that its whole surface is free from the slightest defect. It is then covered with an engraver's varnish made in the following manner:—

Black pitch.....	1 part.
Burgundy pitch.....	1 „
Asphalte.....	2 parts.
Virgin wax.....	2½ „

The two kinds of pitch are first melted with the wax, then little by little, in very small portions at a time, the asphalte is added in exceedingly fine powder, with continued heating and stirring. When the mixing is thorough, withdraw the vessel from the fire, and before the varnish sets dissolve it in essence of turpentine, after which store it in vessels of white iron. Too much turpentine must not be added, it being necessary that the varnish should have a certain viscosity.

The following are the operations necessary in varnishing a plate:—

1. By the aid of a large brush, a thin cold coating of the varnish is distributed upon the metallic sheet; this coating must be of equal thickness throughout. If a bad coating be given, it must be removed, and the operation commenced afresh. The varnish can be wiped off by means of a ball of cotton wool dipped in essence of turpentine.

2. Slightly warm the varnished sheet above an alcohol flame, holding the sheet at about an angle of 45°; the non-varnished side of the sheet must be next to the flame.

3. Then slightly blacken the varnished side by moving it above a smoky flame. This flame may be produced by igniting a little ball of cotton wool soaked in a mixture of linseed oil and essence of turpentine.

4. Very slightly warm the sheet while holding it, this time in a horizontal position, and with its non-varnished side turned towards the alcohol flame.

The heat should be sufficient to drive off the turpentine in the varnish, but too much heat must not be applied, or the varnish will be burnt. Engravers call it "burnt" when it splinters under the graver; it is necessary that when doing cross-hatching upon the varnish by means of a needle or other instrument, there shall be no splintering where the lines intersect each other.

A varnish may, however, become brittle under the graver owing to low temperature in the winter; in such case it contains too much pitch and asphalte, and the fault may be corrected by adding more wax. Too much wax makes it too soft. A good varnish does not splinter under the tool, and at the same time does not adhere to it; in the latter case, fragments stick to the point of the graver, and fall to powder when they are taken between the finger and the thumb. It is better that the plates should be varnished several days before they are required for use.

The lines made by the diamond point in the metal are visible when the sheet is taken from the drum, but they are not deep enough for engraving.

The sheet after removal is first coated on the back with a quick-drying black varnish of commerce, one which dries in half an hour at the outside; it is then placed in a large vessel containing a solution of one part of perchloride of iron in three parts of water. In about ten minutes the etching is sufficient; the plate is removed from the bath and washed instantly in a great quantity of water, then cleaned with cotton soaked in turpentine. Then it may be sent to a lithographer, who can take from it a thousand prints or more. When very long numbers are wanted, there is economy in not doing them all from the plate itself; one good copy should be taken from it in fatty ink, and this impression should be transferred to a lithographic stone, from which the actual printing can be done. Those prints I saw which had been taken by the latter method were inferior to those which had been taken direct from the metal. The same bath of perchloride of iron will do to etch fifty plates at least.

It has been said that ten minutes in the etching bath is sufficient, but if deeper lines are wanted, fifteen or twenty minutes may be allowed, but in this case it is well to watch the action. In general, when a plate is plunged in the bath, in one or two minutes the bright lines made by the diamond are equally tarnished throughout; if parts remain bright, they indicate that the diamond did not work with sufficient pressure, or that the plate had been unequally varnished. In the prolonged action of the bath, if points become exceptionally grey, the coating of varnish is too thin, and does not sufficiently resist the action of the liquid upon the metal. In this case the sheet must be immediately removed and washed in a great quantity of water. Then, if the general condition of the plate be satisfactory, do no more to it, but if the etching be not sufficiently deep, dry it and coat the parts which looked grey with a layer of varnish to preserve them from degradation, then etch the rest of the plate a little more in the bath.

The chief difficulty of the whole operation consists in getting an even coat of good varnish, and of the right thickness, upon the plate.

OPINION OF THE LONDON PRESS ON THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[The Builder.]

THE Annual Exhibition of the Photographic Society of Great Britain, at present open in the rooms of the Society of Water Colours, contains a good many things that are really worth looking at for their success of execution or for the beauty of the objects which they represent; and though the interest which this exhibition excites is cold indeed compared with that aroused by the class of exhibitions which we are accustomed to see in these rooms, the very contrast of feeling naturally suggests some reflections as to the contrast between these two methods of representation, the chemical and manual, and what photography can and cannot accomplish.

The days are long past when photography offered to us as representations of landscape only some half-intelligible assortments of masses of dark and light. Comparatively speaking, the advance of late years is wonderful in this department of photographing, and a good many of the landscape photographs can be really enjoyed for their intrinsic beauty of representation. In almost all cases, indeed, it would seem that something is lost; one point is sacrificed to another, except where the scene offers special circumstances peculiarly suitable to be dealt with by photography. *A Frosty Walk* (31), for instance, by Mr. H. Tolley, represents a phase of nature, the ground whitened by hoar-frost, which falls in admirably with the special powers and the characteristic tone of photography. In *At Ilam, Derbyshire* (52), by the same exhibitor, the main point in the picture consists in the complex and delicate ramifications of the boughs and twigs of a bare tree, which form a network across nearly the whole surface of the picture, leaving the landscape to be seen through them. The anatomy of the tree, caught in every detail with the greatest sharpness, is an exquisite object in itself, and it is of real value in another sense, as a record of natural fact more elaborate than any painter could emulate by the labour of the eye and hand. *Falcon Crag, Derwentwater* (235), again, by Mr. T. A. Green, is composed in this way of a foreground tree—a noble tree—and a distance retiring behind it; the distance is beautifully soft, but we fancy something of it has been lost, and that the softness is really incompleteness; nevertheless, the result is beautiful in its way. Mr. Scamell's *Cottages at Steventon* (557), with the minute elaboration of the foliage and the broad mass of white light on the houses, is a most effective little bit, and here, it will be observed, there is no distance at all, and this is just one of the scenes in which photography succeeds best. Mr. Green's *Head of Buttermere* (236) is very soft and aerial in effect, but, as in many of these soft and rather misty views, the sky is lost, or only seen in faint and uncertain indications of cloud forms. One must except also the water from the foreground of *Cottages at Steventon*—water appears to be in every case and under all circumstances a failure in photography. We have not found one successful example in this collection. Smooth water, giving much reflected light, becomes woolly in texture and loses all hint of water; rough water looks only like a dry, wrinkled surface. Instantaneous renderings of breaking waves or surf, as in *A Ground Swell* (462), by Mr. W. P. Marsh, show the sensitiveness of the modern plate, which can catch a wave actually on the curl, but as a representation of water it is

valucless, almost disagreeable to look at, except solely as a business record of facts of form which a sea-painter may perhaps find useful to refer to. Among other landscape subjects which are successful may be mentioned the two platinotype photographs *On the Thames* (425), exhibited by the School of Military Engineering, the lower plate especially: two by Mr. F. M. Sutcliffe (548, 549), the first a fine little scene carefully chosen for effect—two trees on a ridge of down near the foreground, and a cloudy evening sky behind—a photograph into which something like poetic feeling has been conveyed; *View of Moel Wyn from Festiniog* (535), by Mr. C. E. Nesham, in which the large extent and aerial perspective of the hills is finely reproduced, though the sky seems to have been lost; *The Lea at Ware* (552), by Mr. Edgar Clifton, a carefully chosen subject, with an old barge in the foreground—artistic feeling is shown here in the choice of subject and point of view at all events; *Dunluce Castle* (219), by Mr. Vernon Heath, of which the same may be said; and *Carolling*, by Mr. H. P. Robinson (40), a landscape with two figures walking through fields, in which the landscape has really the softness and distance of a water-colour painting, but we imagine this has been touched upon and is not pure photographic work.

The figures in this last, however, jar upon the sentiment of the scene; they are supposed to be two rustic women singing as they go through the field. Mr. Thorne Waite or Mr. Tom Lloyd would have made a couple of expressive figures of them, in harmony with the feeling of the landscape; here we are brought down to the plain prose of commonplace everyday life, and the result is a total failure. The study of this and of a good many other photographic subjects compiled with similar aims is very instructive. It shows what we owe to art and artists in the production of the rustic idylls which form such a prominent and such a generally beautiful portion of our water-colour exhibitions. The photographers are very fond of trying to do the same thing, and the failure, in most instances, where the picture is simply a direct chemical transcript from nature, is complete, and in many cases almost ludicrous. *A Pretty Hop-picker* (63) seated on a stile is not pretty a bit; her face is a dead, dull blank. Mr. J. Gale shows some cottages or rural scenes with figures, the most successful being *Saturday Afternoon* (249), where he has been rather fortunate in his figures, and the broad mass of light on the white cottage is a good piece of effect. In others, such as *Too Wet for the Woods To-day* (245), the figures of an old woman leaning over the gate and a man coming up to it are simply vulgar. We can fancy what Mrs. Allingham would have made of them; and the same thought occurs in reference to *St. Catharine's Hill, Guildford* (61), a charming nook of landscape with a little girl seated in the midst of it just in the spot where "the figure" is wanted—it is all right so far, but the common, inexpressive countenance of the child spoils it; the artist's hand was wanting. So again in *The Secret* (553), by Mrs. Payne, a little girl and boy; a charming expression has been caught in the former, but the boy's face looks dull and sulky. Photography, in fact, gives in general the commonest and poorest expression of the countenance; the artist seeks out and gives the best expression; and there is a gulf between photography and art, or at least a part of it, for the still greater and essential distinction lies in the delight we all find in creating ourselves, or in studying the creations of others. Photography merely copies; the artist—even the most nominally realistic artist—does far more than copy, and nowhere can this distinction be more clearly seen or more strongly felt than in studying the efforts of photographers to produce pictures of human life. *Home, sweet Home* (41), an interior by Mr. Lydell Sawyer, is another, we might almost say flagrant, example; the little bunched-up figure of the child held up in its father's arms is capital, and would be worth the attention of a painter, but the figures and physiognomies of the parents reduce the whole thing to sheer vulgarity.

Among really successful figure scenes we may, however, mention the little sleeping child, *Tired Out* (482), by Mr. R. W. Robinson, a perfect little picture just as it is.

In what has been with the public the great and popular function of photography, the taking of portraits pure and simple, there are some brilliant successes. Among these the three *Studies* by Mr. McLeish (292) are admirable; the photographer has been fortunate in his subjects, but he has also known how to light the profile portrait of the beautiful young girl on the right so as to give the most brilliant and striking effect to it. A medal has been awarded to another series of large portraits by Mr. W. J. Byrne (283), but from the artist's point of view these are not so good as No. 292, and in particular in the centre figure of the girl's head, nearly life-size, the modelling of the mouth has been quite lost.

As on former occasions, architecture, which of all classes of subject lends itself best to photography and loses least by any defects of the process, is the least represented of any class of subject. There is a fine and remarkably sharp view of *St. Paul's Cathedral* (20) by Mr. J. Bracebridge Hilditch, which, considering that it is an enlargement from the original negative, is a triumph of clear definition. It has been touched upon here and there with white for high lights, but so obviously as not to constitute any deception. Mr. Richard Keene shows some *Interiors of Osmaston Manor* (4); Mr. W. Webster some interiors of *Eaton Hall* (21). Mr. Salmon has some good photographs from *St. Bartholomew's* and other City churches, Mr. T. M. Browning gives a good view of the *Ponte Vecchio* at Florence, and Mr. Bedford Lemere has been successful in producing some very elaborate interior detail from rooms in *Beau Manor* (92).

Perhaps the most remarkable of all the architectural photographs for sharpness of definition are the two by Mr. Mold, of interiors of *St. Mary's Church, Banbury* (189 and 432), a classic interior which appears to have undergone recent decoration. Considering the difficulties in regard to light in interiors, these may be called extraordinarily successful. But we should recommend the Society to pay more attention to architectural photography, especially of ancient works, in their exhibitions: there is no class of subject in which their work can show to more advantage or be of more value.

Among the curiosities of the Exhibition is an architectural curiosity also, a photograph of a real contemporary series of lake dwellings, in full occupation, at *Tapusalai*, in New Guinea (404). Any architect visiting the exhibition would find it worth while to look at this. There are various photographs of flashes of lightning (but these are getting common now); photo-micrographs of minute objects from plant and insect life by Mr. F. H. Evans, for which the exhibitor has received a medal; the photograph of the claws of the house-apid, magnified 240 times, is one of the most remarkable and successful of these. Mr. G. W. Webster has somehow succeeded in photographing a couple of skylarks and their nest, the one bird on the ground, the other just hovering down; how he managed to get so close to the birds as to secure the photograph without frightening them away is the marvel; but the bird in flight illustrates one of the weak points of instantaneous photography: the bird's wings seem stationary, just as in the case of the instantaneous photograph of an express train which we noticed on another occasion: all idea of motion is taken away, wheels and wings alike are stopped dead. Mr. Sidney Tebbutt shows a photograph taken on a moonlight night in Saxony—"full moon and cloudless sky, exposure three hours, from ten p.m. to one a.m.;" but here again photography fails—it conveys no idea of moonlight; the lens, in fact, sees more than the human eye can, and as we mentally refer to our experience from actual vision, the photographic result appears false, though, in a scientific sense, it may be true enough. On the whole, the more we study photography, the more we feel how far removed is real art from mere imitation of nature; how much of the pleasure we derive from painting springs really, unknown perhaps either to spectator or artist, from the expression of the artist's own mental mood, and that sympathetic response to it in the mind of the spectator, which mere photographic reproduction is powerless either to express for the one or to awaken in the other.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 14,112.—"An Improvement in the Means or Apparatus for Washing Photographic Negatives and Prints." W. A. M. BROWN.—Dated October 18, 1887.

No. 14,171.—"Magic Lantern Slide Stages and Carriers." J. H. STEWARD.—Dated October 19, 1887.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
November 1.....	Carlisle and County	
" 1.....	Glossop Dale	Society's Rms., Norfolk-sq., Glossop
" 1.....	North London	Myddleton Hall, Upper-st., Islington
" 1.....	Sheffield	Masonic Hall, Surrey-street.
" 1.....	Sutton	Society's Rooms, 18, High-street.
" 1.....	Paisley	
" 1.....	Holmforth	
" 1.....	Coventry and Midland	Coventry Dispensary.
" 1.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 2.....	Edinburgh Photo. Society	Hall, 20, George-street, Edinburgh.
" 2.....	North Staffordshire	Mechanics' Institute, Hanley.
" 2.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 3.....	Bolton Photographic Society	
" 3.....	Dundee and East of Scotland	Lamb's Hotel, Reform-st., Dundee.
" 3.....	Glasgow Photo. Association	Philosophical Soc. Rms., 207, Bath-st.
" 3.....	Leeds	Philosophical Hall, Leeds.
" 3.....	London and Provincial	Mason's Hall, Basinghall-street.
" 4.....	Halifax Photographic Society	M. Manley's, Barum Top.
" 4.....	Yorkshire College	

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Last Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. T. Sebastian Davis presided.

Various manufacturers explained the details of their apparatus on view at the Exhibition, many of which details would not be explicable in print without the aid of engravings.

Mr. T. SAMUELS demonstrated the working of his portable camera, as already described in these pages. It weighs four pounds thirteen ounces when charged with twelve 5 x 4 plates. He had not found any uncertainty in the action of changing the plates.

Mr. W. F. DONKIN explained the action of an indicator he had attached to Mr. Samuels's camera. He had found that the indiarubber bag was not light-tight, neither was another bag which had been supplied to him, consequently the plates were fogged.

Mr. SAMUELS said that the latter experience was exceptional. He then exhibited his photographic tents.

Mr. W. H. WALKER described the new Eastman's roller slide. He had found that for English-made cameras a wooden was better than a metallic frame in the construction of the slide. The slide contained apparatus for keeping the paper in a state of definite tension, a principle which Messrs. Eastman were the first to introduce; otherwise at the points of suspension, when the paper expands and contracts with hygrometric changes, the paper will fog on development, though it may never have been exposed to light. This keeping the paper constantly in a state of equal tension is a most important thing in a roller slide. Out of sixty thousand amateurs in the United States he had never found one who preferred a hinged shutter to one which can be wholly withdrawn from the slide, though some objection to the latter was now and then expressed in England, perhaps from want of sufficiently long experience in the use of the American system. In some of their new slides enough paper for forty-eight exposures could be enclosed if the purchaser so desired. Perforators were not necessary; there was no safer method than to cut off by the aid of measurement each length exposed.

Mr. J. R. GOTZ exhibited his camera and view meter; the camera back had an improved swing motion, and the whole instrument was so made as to permit the obtaining of an extremely long or extremely short focus without any projecting parts being in the way. He also exhibited an improved shutter.

Mr. C. G. COLLINS exhibited a whole-plate camera with a novel front and a bellows which would rise and fall with the lens; he explained other points of detail. He also exhibited an adjustable bamboo stand and his detective camera.

Mr. HOWARD exhibited Mr. W. Tylar's double band shutter and explained its action. He also exhibited Messrs. Arundel & Marshall's plate boxes containing metal grooves covered with paper.

Mr. J. TRAIL TAYLOR asked what was the special point of novelty; plate boxes with metal grooves had been used years ago.

Mr. S. G. B. WOLLASTON had seen boxes with metal grooves covered with paper fourteen years ago.

Mr. A. MACKIE wished to know on what grounds a medal had been awarded for the boxes; the same firm had before exhibited much the same thing in public.

Mr. W. M. ASHMAN saw no points of novelty in the exhibit.

The CHAIRMAN said that the flap over the top and the interior ends of the box turning down to give power of greater grip of the plate were most useful.

Messrs. Watson & Sons' representative exhibited a detective camera, a translucent measuring glass, a cyclists' stand, and some metallic measuring dishes.

Mr. LEZARD exhibited his photochronoscopes for recording the times of exposures, the length of which could be indicated by means of the instrument and at the will of the operator.

Mr. Howard exhibited Mr. McKellen's camera.

General Preston complained that it was an injustice to country members who came up to town that apparatus announced to be described upon a particular night was not all described in consequence of other business earlier in the evening trenching upon the time of the meeting.

A vote of thanks was passed to those who had exhibited apparatus.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

On Thursday night, October 20, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. A. Haddon presided.

Mr. H. W. G. FISHER exhibited the Welsbach light, which has already been fully described in these pages.

Mr. W. H. PRESTWICH had tried the light in his own home, and found the mantle to exhibit signs of decay four nights after purchase; in no very long time it was completely blown to pieces. He had been lighting the burner from the top of the lamp glass.

Mr. FISHER thought that by lighting the gas from the top of the glass instead of from the bottom Mr. Prestwich had produced small explosions of mixed air and gas which had blown the mantle to pieces. Mr. Winter, who was then present, had been using the light for three months, and could testify that the mantles were as good as at first. The gas consumed by each Welsbach burner averaged two and a half feet per hour, and was never more than two and three-quarter feet. The one on the table before them was then burning two feet per hour and giving the light of twenty candles. A Bray's burner, which he had selected haphazard from those in use in the room, burnt exactly five feet per hour, as tested by the same gauge.

Mr. A. COWAN stated that he had brought some plates with him which at a distance of eight feet from a No. 4 Bray's burner, and with an exposure of sixty seconds, gave a faint twenty under Warnerke's sensitometer screen. He then made some experiments in the room with these plates at the same distance, first employing the Welsbach light, burning two feet per hour, and afterwards the Bray's burner light consuming five feet of gas per hour; the former gave twenty-three on the sensitometer and the latter nineteen.

Mr. J. B. B. WELLINGTON said that the experiment proved that the Welsbach light had two and a half times more photographic power than the flame of the Bray's burner.

The CHAIRMAN added that for equal consumption of gas the Welsbach light had five times more power.

Mr. SPINKS, of Brighton, exhibited a Sargeaut's shutter which he said worked well.

The CHAIRMAN said that it and Grimston's shutter were made upon a principle introduced long ago from Russia by Mr. Warnerke.

Mr. A. L. HENDERSON had been testing the dry plates of the United Kingdom Company and found them to give sixteen on the sensitometer.

Mr. Fisher then sat for his portrait at a distance of about one yard from the single Welsbach light. Mr. Henderson exposed a half-plate in the camera for sixty seconds; the plate was one of a batch which gave twenty-two with Warnerke's sensitometer; on development Mr. Fisher's face came out pretty well, but not the dark parts of the subject. Several other plates were exposed upon the same siter by various operators and the plates taken home to develop.

CAMERA CLUB.

THURSDAY, October 20, was the monthly lantern evening, and an excellent selection of slides was exhibited to a large company of members and friends numbering considerably over fifty.

The chief item of the evening consisted of a set of transparencies by Mr. W. Brooks, of Reigate, of interior and exterior views of Windsor Castle. Some of these were very fine both in tone, detail, and prospective effect.

Other slides were shown, including many from negatives taken on Club excursions by the Rev. — Fison, and Messrs. Barclay, Ferrero, and Howlett.

The lantern was worked by Messrs. Lyonel Clark and Gifford.

On Thursday, November 3, the subject is *Intensifying Gelatine Negatives with Mercury followed by Schlippe's Salt*, to be treated of and demonstrated by Mr. W. E. Debenham, at eight p.m.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held on Tuesday, October 18, at Myddelton Hall, Islington, N., Mr. J. Traill Taylor, President, in the chair, Messrs. F. Dunsterville and E. W. Parfitt were elected members of the Society.

Mr. A. MACKIE gave a demonstration of the method of preparing and developing collodio-bromide emulsion plates. In the course of his remarks he said the glass plates, after having been thoroughly cleaned, required some treatment to prevent the film slipping. A coating of thin indiarubber solution or even an edging of the same was effective, as was also a dusting of French chalk well polished off; but the method he recommended was a modification of that published by Mr. J. B. B. Wellington. It consisted simply in immersing the cleaned plates in a very hot solution of gelatine containing about twenty grains to the pint and drying with a clean cloth. The plates were coated with the emulsion by pouring it on exactly as, in the wet plate process, the plates were coated with collodion; but he advised that the surplus should not be returned to the stock, but should be received into a separate bottle, as by this plan spots in the plates due to dust were in a great measure avoided. The exposure for contact printing would be about twenty to forty seconds when a gas flame was used, but he preferred to use magnesium ribbon, a half-inch to one inch of which burned a foot from the negative would be found sufficient. The development was preferably by alkaline pyro, and either liquid ammonia or the carbonate of ammonia, potash, or soda, might be employed, the proportion being suitably adjusted. The following formulae would all be found to work well:—

Liquid ammonia	2 minims	} With 8 grains of pyro, 4 grains of bromide of ammonium, and with sulphite of soda, if preferred, to the ounce of developer.
or, Carbonate of ammonia.....	16 grains	
or, Carbonate of potash	24 "	
or, Carbonate of soda	40 "	

The colour of the image was somewhat dependent upon the alkali employed, but to a greater extent was controlled by the amount of the exposure, a full exposure being necessary to obtain a warm tone, and with a thin negative it was advisable to increase the pyro. Before development the plate should be flooded with methylated spirit and then washed until water would flow over its surface without streaky lines. A dish might be used for the development, but was not necessary, and the plate might be developed in the hand in the same manner as a wet plate. Speaking of the advantages of collodion over gelatine for transparencies, Mr. Mackie referred to the absence of any requirement for special apparatus for drying the plates, which would dry spontaneously in a few hours in an ordinary wood grooved plate box. By applying heat, however, the drying need not take more than a few minutes, and he claimed that it was quite possible to prepare a plate, expose, develop, fix, wash, dry, and bind it, so as to make a complete lantern slide, in a quarter of an hour. The whole of the operations were successfully performed at the table and the resulting slide afterwards passed through the lantern.

Mr. J. NESBIT then described the apparatus he used for reducing to lantern size from larger negatives, which was so arranged that the negative might be shifted so as to bring any part of it opposite the lens. The illumination was obtained by pointing the apparatus to the sky, but a reflector at an angle of forty-five degrees might also be used. In reply to a question, Mr. Nesbit said that no light except that passing through the negative should be allowed to reach the lens.

The nomination of officers for the ensuing year then took place, after which the lantern was set up and a large number of slides exhibited.

The next meeting will be on Tuesday, November 1, and will be the annual general meeting.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

The usual fortnightly meeting of this Society was held at the Greyhound Hotel, Dulwich, on Wednesday evening, October 19,—Mr. Yates in the chair.

Mr. W. H. Baldwin and D. Williams were elected members.

Mr. J. THOMSON, F.R.G.S., gave a lecture on *The Use and Abuse of Photographic Lenses*. Beginning with a general survey of the origin of lenses, Mr. Thomson described the properties of their various forms from the pinhole to the most recent patterns. When treating of wide-angle lenses the lecturer pointed out where this form could be used without destroying pictorial effect in the resulting picture. Mr. Thomson showed how the topographical value of pictures, especially of new countries, was entirely destroyed by the use of a lens of an angle widely differing from the human eye. The lecturer concluded by treating of the best form of lens for enlarging purposes.

A vote of thanks was accorded to Mr. Thomson for his lecture. At the next meeting, on November 2, a paper will be read by Mr. Herbert Starnes on *The Permanence of Different Varieties of Photographic Prints*. Visitors desirous of being present will kindly communicate with the Hon. Secretary, Mr. Harold Senior, 88, Norwood-road, S.E.

BRISTOL CAMERA SOCIETY.

The first meeting of the winter session of the above Society was held at the University College on Thursday, the 13th instant,—Dr. Arthur Richardson in the chair.

The first business of the evening was the election of the following members:—Mr. J. H. Brock, Rev. H. C. Coote, Mr. J. Carlidge, Dr. D. S. Davies, Messrs. A. Keitch, Percy Lewis, J. W. Munro, R. C. Newick, and H. T. Rudge.

After which the CHAIRMAN proceeded to make some remarks in reference to the Society and photographic matters generally. He considered members of such a Society were placed in an advantageous position, having the opportunity of studying various subjects bearing upon the art in conjunction with their fellow members, by which means they were likely to gain more knowledge than by individual efforts and research. The aim of a photographic society, he maintained, should be to investigate, and he would remind his hearers of the ample field in which to labour. Chemists are at present undecided as to whether the image formed by the action of light is built up of particles of metallic silver or a subchloride of silver. Here was scope for investigation. He would also like to direct their attention to orthochromatic processes, which, when perfected, he considered would be a step in the right direction, inasmuch as it would give better proportion to various colours and enable us to form a more correct idea of their relative intensities. Our idea should be to have an intelligent understanding of the theory of different processes employed and a reason for results obtained. He should like to know if any of the members present had tried the experiment of exposing a piece of plain glass in the camera to an object and developing the image by means of breathing on the same, as in the case of exposed carbon tissue.

In compliance with the request of the Council, a large number of prints, the result of the summer's work, were handed round for inspection and criticism, and much useful information was elicited.

The meeting terminated with a vote of thanks to the Chairman.

BURY PHOTOGRAPHIC AND ARTS CLUB.

The annual meeting of the above Club was held on Wednesday, October 19, at the Temperance Hall,—The President, Mr. F. W. Livsey, in the chair.

There was a large attendance of members, which proved the interest shown in the Club, and impressed upon the Council the necessity of providing larger rooms.

The following gentlemen were then elected as officers for the ensuing year:—President: Mr. F. Cooper.—Vice-Presidents: Messrs. W. S. Barlow and E. W. Mellor.—Council: Messrs. H. M. Dearden, C. H. Openshaw, R. Grundy, jun., A. Taylor, and W. Booth.—Hon. Secretary: Mr. F. W. Livsey.—Assistant Hon. Secretary and Treasurer: Mr. R. Grundy, sen.—Auditors: Messrs. J. Newbold and K. Wood.

Votes of thanks were passed to the retiring officers.

The members then resolved to hold an Exhibition and *soirée* in the early spring.

Correspondence.

THE PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—Apropos of your reference in last week's issue to the *World's* critique on the present Exhibition in Pall Mall, I should like to ask, as a member of some years, how the Society came to accept and hang—to say nothing of giving them a medal—the pictures referred to by the *World* as having been for months used for advertising purposes?

I was under the impression that one condition of entry to the Pall Mall Exhibition was that the picture should never previously have been exhibited in London. At any rate, I know a few years ago that was the reason put forward semi-officially for not awarding a medal to a well-known professional exhibitor—one of the pictures in his frame had been exposed for sale at the art publishers'. What, then, has occurred to alter the minds of the erratic directors of the "poor old parent" sufficiently to induce them to admit and medal a series of pictures that have graced the Strand and other public-house windows for months past?—I am, yours, &c.,
A MEMBER.

PHOTO-MICROGRAPHS AT PALL MALL.

To the EDITORS.

GENTLEMEN,—There is no objection to Mr. Evans "cracking up" his own work, and pointing out the excellencies and difficulties which it appears critics have failed to observe in his exhibits at Pall Mall, so long as his modesty does not stand in his light and he can persuade you to print his letters. To all this there can be no objection, and I raise none. But surely it is unkind and unjust to belittle my poor productions by comparison with Mr. Evans's own feats, his "artistic and natural effects in illumination and great depth of focus, that elicited the very high praise" to which we are referred in the *Journal of the Royal Microscopical Society* and the *Photographic Year-book*, chapter and verse being freely quoted. Is it noble of Mr. Evans to allow his "extra deep objects, such as polycistina—opaque—taken with the one-inch O. G." to bully my miserable little organisms, some less than $\frac{1}{1000}$ th of an inch in diameter? It is all very fine to interlard criticisms with epithets such as "beautiful," "exquisite," and "artistic;" Mr. Evans's intention is plainly to make my work suffer by comparison not only with his own, but with that of Dr. Crookshank, who is, I understand, one of the most expert bacteriologists now alive, but who never within my knowledge showed any of his results

at any photographic exhibition, and so should not be brought into evidence to annihilate me or Mr. Evans's misguided critics. Does it not occur to Mr. Evans that his "faint praise," if not actual strictures, will tend seriously to discourage a struggling disciple who five months ago had never seen an O. G. of higher power than a quarter of an inch, and did not precisely know the meaning of homogeneous immersion, who never had heard of a paraboloid, nor ever attempted to use a polariser two months ago? I ask if most people in my present sad position would not be inclined to make a bonfire of the camera and send the objectives to the nearest pawnshop? As Mr. Evans is strong, oh, let him be merciful!

The worm, however, will turn sometimes, and, with your permission, I will attempt to palliate my offence in having dared to exhibit micro-organisms, in which Mr. Evans takes no interest, and which Mr. Evans considers to "have no structure to pay for cars in delineation," and no value "therapeutically" or pathologically. Pasteur, *teste* Mr. Evans, is past his zenith (in the Evans I suppose), Klein is on the decline, Crookshank is a lean and slipped pantaloons, and should be written "Crookshank-shanks," Maddox has been inoculated from a Mad-dog. "Theorists," says Mr. Evans, "are already decrying the value of Pasteur's processes and supposed results." If careful experiment and close reasoning can prove anything at all it is clearly proved that certain micro-organisms have pathological value, but, granting that Mr. Evans is right, and the men I have named all drivellers, what has this to do with my photographs? I have made no assertion about bacteria, I only exhibited my attempts to photograph certain objects, and I never asked any one to believe my photographs represented "the living originals." I have not examined Mr. Evans's wonderful exhibits, but I shall do so when I get a chance with immense interest now, as I am bound to infer, first, that they are truthful renderings of "the living originals," and, second, that Mr. Evans has overcome the great *crux* of "focussing all planes with equal sharpness, even in extra deep objects." This, he says, was his aim, and as he considers his critics unkind I suppose he claims to have overcome his *crux* as far as possible; how far it is possible to show "widely divergent planes in focus together" is a matter worthy of some consideration. Perhaps Mr. W. E. Debenham will "favour the company with a sentiment."

Mr. Evans further seems inclined to cavil at my exhibits because "none but actual students and workers can at all appreciate (I don't mean enjoy) them at their real value." In the first place, I did not exhibit my micrographs with any expectation that persons ignorant of their nature would appreciate or enjoy them, nor do I see any necessity for any such consideration on exhibitors' part. In the second place, the same objection appears to hold equally good with Mr. Evans's own exhibits at Pall Mall; so far as we have any means of judging nobody except the jurors have either appreciated or enjoyed them. I do not venture to criticise Mr. Evans's exhibits, not having seen them except for a moment by chance but I hope in a short time to have the advantage of a close study of his photographs of "rare and beautiful objects." Mr. Evans makes great capital out of the difficulty and rarity of dark-ground illumination. I know nothing of its rarity, but I venture to deny the difficulty with a paraboloid or spot lens. I have done only a few dark grounds, but I found very little difficulty in producing what appeared to my untutored mind respectable representations of the objects I tackled. The use of polarised light I do find somewhat puzzling, but Mr. Evans has probably mastered that difficulty, as he does not mention it.

"Mr. Pringle's beautiful photographs charmed me most as specimens of exquisite decorative designs." In spite of the "beautiful" and "exquisite" this is evidently not intended as a compliment to what were shown as purely scientific photographs; in fact, it is pretty straight condemnation of my work as scientific or useful. But what a happy vein of thought it opens! Bacteria micrographs as decorative designs! My fortune is made! I shall at once call on Mr. Maple, the popular house decorator, and submit to him a selection of my designs for decorative purposes. A wall paper of *Cladothrix dichotoma* pattern, or of gold picked out with *Micrococcus tetragonus* would indeed be "exquisite" and original. *Micrococcus crepusculum* would be suitable for a dining room, and every aristocratic house would have, not its "red" or "blue" room, but its *Colmia rosco-persicina* chamber. Teacups might be adorned with a sprig of *Saccharomyces glutinis* and a neatly inserted *Bacterium lactis*, while the cosy would appropriately be sewed in zooglaea of *Spirilla attenuata* (warning). Mr. Culleton might also secure my services for his search after armorial bearings. I could at least suggest some new es-utechons: "On argent field three *Spirilla undula* rampant, with the device, 'Thereby hangs a tail.'" As Mr. Evans does not believe in bacteria I cannot find bacteriological bearings for him, but I would suggest as a motto: "Wha daur medal wi' me?"

Enough, however, of this fooling. I do not see that Mr. Evans has in the very least exalted the public opinion of his exhibits by his depreciation of mine. Perhaps the reverse is the case. If I consider, after seeing Mr. Evans's work, that it calls for any special eulogy, I may ask you to publish my "coals of fire;" if not, the matter may be different. Meantime I protest against one thing which Mr. Evans does, viz., frightening people by bogus difficulties; and I guess your readers will join with me in deprecating another thing, viz., venting spleen in your columns against other journals and on offending persons.

My exhibited prints were among my earliest attempts in their line—in photo-micrography, indeed. I never expected an award for them, I do not

say they are the best ever done, and next year, in spite of Mr. Evans's discouragement and unbelief, I hope to show some bacteriographs both bigger and better.—I am, yours, &c.,

ANDREW PRINGLE, B.D. (Bacteriological Decorator).

ADHESION OF FILMS.

To the EDITORS.

GENTLEMEN,—In reference to the article on *Removing an adhering paper negative from its support*, perhaps the relation of my experience may be of service.

For a long time past I have used none but Eastman's paper negatives. I often, for the amusement of experimenting, do not follow—at least entirely—the directions given, and the following is my mode of procedure. After fixing, I thoroughly wash under a high-pressure tap, drain until water on negative ceases to drop, and then put it into methylated spirit. As I have written you before, this unmistakably clears the negative. After remaining in the spirit from three to five minutes, take it out and lay it at once down on a thin sheet of polished vulcanite. If the vulcanite has been used before, give it a rub with an old cambric handkerchief. When the negative is down on the vulcanite, put a double piece of blotting-paper over it, and roll it down with a common ruler. It will have a somewhat mottled appearance for a few moments, but rapidly get quite evenly white. Either let it stand against the wall till you want it, or at once, if you please, hold it over a paraffin lamp, first one side and then the other, and with some patience it will begin to loosen at one edge or corner and gradually come off, but don't pull it.

However, I find that all this can be saved, and after washing, by hanging the negative up by two pins—one in each corner—against a shelf, and letting it dry spontaneously, afterwards putting it under a lever copying press, you can get it quite flat after twelve hours' pressure, but you may print from it at once, and the pressure in the printing frame will go a long way to flatten it, especially if printed as I always print my paper negatives—in the sun.

While writing may I say I am glad to see in the "Answers to Correspondents" that there is to be an article on Hydrokinone in the ALMANAC? I hope to learn something from it, although, as I am very successful with my one solution developer—proportion one to sixteen—I don't know what I want more. Can you tell me the formula for meta-bisulphite potash?

I see in *Chambers's Journal* that the manufacture of soda and potash, especially the latter, is made much cheaper. If it reduces the price of hyposulphite potash to even double the price of hyposoda, photographers will not be long in finding out how much better the former is than the latter for fixing.—I am, yours, &c.,

W. T. F. M. INGALL.

Greenhithe, Kent, October 20, 1887.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

A. Hill, Stonehouse, Devon.—Three photographs of Sir J. Puleston, M.P. for the Borough of Devonport.

J. SMITH (Burton-on-Trent).—Size the pictures.

C. BANYARD.—The Exhibition closes on November 14.

A. A. A.—All the lenses mentioned are constructed on the same principle.

HANLEY.—There is no work on the subject published. See leader in another column.

T. W.—Eau de Javelle is far preferable to the zinc salts, as it leaves no insoluble compound behind.

J. WORMALD.—Something is wrong either with the acid or the litmus paper—probably the former. Get a fresh supply.

T. E. WATSON.—Paper the side and front walls with a pale neutral-toned paper in preference to whitewashing them. An ordinary room paper with a neat pattern which is not too dark will answer the purpose.

AJAX.—For the purpose mentioned we, were we in your place, would select a single achromatic landscape lens of about thirty inches focus. If the lens be of a very pronounced meniscus type one of shorter focus will cover the plate quite well. Provision will have to be made in the camera for swinging back the top of the ground-glass else will not foreground objects be in focus.

A. COURTNEY.—In all probability the albumen on the paper you have employed was coagulated, hence the ink has adhered to all portions alike. For making transfers for photo-lithography the albumen must not be coagulated, otherwise, as in your case, the ink cannot be washed away from those parts upon which the light has not acted. It is not usual to coagulate the albumen on commercial papers nowadays.

C. H. L.—1. The only preparation the glass requires is to make it chemically clean. Nitric acid is very commonly used for the purpose. If you follow either of the receipts given in the ALMANAC you ought to succeed.—2. If the residues only contained sixpennyworth of silver no more could be recovered. "About three-quarters of a pound of paper cuttings" if reduced to ashes would not amount to much. The small amount charged by the refiner could not have paid him, we should think. In future it will be better to burn the paper yourself and assay the ashes before sending them away. This plan of proceeding will be more satisfactory to yourself and also to the refiner.

J. E. GOWER says: "I have used ordinary dry cake water colours for spotting some prints; will they stand burnishing without the spots being in any way moved? In the ordinary way I do not burnish my prints, so do not know anything about the proper sorts of paints to use."—The best plan will be to try the experiment. Some colours will adhere and others will not. If it be found that the colour comes off in the burnishing we should recommend our correspondent to mix them with albumen.

OLD PAPER writes: "I have recently had given to me a quantity of photographic material amongst which are several quires of albumenised paper. As I know this is very old (some of it probably twenty years, none less than ten), and as I wish to print a large number of negatives, will you kindly inform me if the resulting prints may be made better than they otherwise would be by any variation from the usual method of treatment in their production?"—If the paper has been kept in a dry place it will probably be none the worse for the keeping, but if it has been allowed to get damp it may be next to worthless. If the paper does not work properly our correspondent should send one or two prints for us to see. We may, however, mention that paper albumenised twenty years ago was usually more highly salted than modern ones, consequently a stronger sensitising bath will be required.

PERPLEXED writes: "My studio is blinded with white blinds, and I get very nice soft negatives, but I am very much troubled with the light in the eyes being all wrong and much too strong. I suspect it is owing to light coming through the blinds from a source different than through the open blinds. Can you tell me through your columns if this is so? also, what colour of blind you would recommend me to use, as I contemplate blinding my studio anew? Also, if you think green a suitable colour, as I think it would be pleasant to the eye. I find great difficulty in getting blind cloth to buy with a soft texture; I have written for samples to several firms, and they are all too hard for the purpose of running well."—We strongly suspect that the trouble arises not so much from the light coming through the white blinds as from too much front light being admitted into the studio. At this time of year, unless the sun shines direct on the studio, white blinds ought to be sufficient. Green is a very good colour for blinds, and a proper material for the purpose may be obtained at most upholsterers and blind makers.

RECEIVED.—Report of Manchester Photographic Society, and President's Address at Dundee Society. In our next.

PHOTOGRAPHIC CLUB.—The next meeting of this Club will be the annual general meeting for election of officers, &c., November 2, 1887.

We learn from the London Stereoscopic Company that their Third Annual Amateur Photographic Exhibition is likely to prove a great success. No less than 250 ladies and gentlemen from all parts of the world have entered for the fourteen classes, sending 2260 mounts, comprising some 4000 pictures. Due notice of the opening of the Exhibition will be given.

MESSRS. SMITH & PATTISON, Wabash Avenue, Chicago, in sending us some details relative to a new burnisher of alleged great merit which they are bringing out, and concerning which some particulars will be found in those pages of the forthcoming ALMANAC devoted to commerce, enclose a parcel of cabinet portraits burnished by this new candidate for popular favour. So perfect and bright is the finish that at first we thought they had been enamelled.

THE news of the death of Mr. Edgar Gould, of Elswick Lodge, Newcastle-on-Tyne, will be received with deep regret in many quarters. For a number of years Mr. Gould has managed the photographic business in the Elswick Works, and specimens of his skill in this connexion are distributed over all parts of the globe. The people of Newcastle and neighbourhood are, however, better acquainted with his merits as a photographer from the fine pictures which he has exhibited in the Art Gallery as a member of the Photographic Association. He was possessed of a nice artistic sense which, combined with the most skilful manipulation, enabled him to produce works of high excellence. In the various outdoor contests which the Society held he was often distinctly successful. A quiet, intelligent, kind-hearted man, he died at the early age of forty-seven, leaving behind nought but gracious memories.

ART PHOTOGRAPHS.—Although it may be the function of a Reynolds, Gainsborough, or Millais, to do full justice to the beauty of the living creature, and a Turner, Constable, or David Cox, to reproduce that of the mountain or plain, there is much to be done with the photographic lens which it would be folly to disparage, and infinitely more than it is ordinarily made to convey to us. A little happy touch of expression is a phenomenon one hardly ever remembers to have seen in a photographic portrait. The photographic artist who wishes to produce a really successful portrait studies the special defects as well as the special beauties of the sitter before him, and considers in what view the faults of such a physiognomy will assert themselves least strongly and the merits show the most. This is the function of an artist, of a man of considerable natural abilities and very great experience. Much might be written about the question of shadows and their value. Queen Elizabeth, in her ignorance, thought shadows unbecoming to the glory of her Majesty, and desired to be painted without any at all; and even at the present day there are ladies who think shade a smudge, dirty thing, the less of which comes on their countenances the better. But light cannot be thrown out in its full brilliance nor forms shown in their variety without shade.—*Liverpool Post.*

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE GENESIS OF THE ROLLER SLIDE.

SOME mistaken ideas appearing to prevail with regard to the origin and nationality of the roller slide, we shall endeavour to place this matter on a solid foundation.

As will be seen, we shall not be stinted in our acknowledgments of what the mechanical genius of America has effected in the way of revolutionising and rendering practicable this increasingly popular piece of photographic apparatus, but its first inception is due to an Englishman, Mr. A. J. Melhuish, of London, at that time of Blackheath.

In the third volume of the *Journal of the Photographic Society*, and in the number issued under date of April 21, 1856, appears a description and drawing of a roller slide by the above-named gentleman. In this the sheets of paper were gummed together so as to form a long band, the ends of which were then gummed to pieces of paper always kept on the rollers. During exposure the sheet was pressed against a plate of glass by means of a board behind it. The time occupied in fixing thirty-six sheets to the holder was about an hour.

Working without a knowledge of what had been thus accomplished in the earlier days of the art, Mr. Leon Warnerke, in June, 1875 (see *THE BRITISH JOURNAL OF PHOTOGRAPHY*, vol. xxii., page 307), submitted to the South London Photographic Society a dark slide, in each end of which was fixed a roller on which to wind and unwind a sensitive film he had just previously introduced. It is perhaps difficult to say why the Warnerke slide did not attain popularity. The drawback which we experienced in using it arose from the trouble in affixing the film or paper to the roller and winding it upon it, operations which had to be conducted in the feeble light of the dark room. It fell into desuetude and became almost forgotten.

The next advance in the history of the roller slide was of quite a revolutionary nature, as an entirely new feature was introduced. It was the invention of Messrs. George Eastman and W. H. Walker, of Rochester, New York. The leading idea in the invention was the introduction of what we may term the spool system, that is to say, the films were supplied ready wound up upon spools or cores, which could be transferred in their wound up state from the long, light-proof cardboard cases in which they were supplied to the dark slide which was specially adapted for their reception; and by this ingenious contrivance the problem was solved.

Contrasting then and now,—the ancient and the modern, the *hour* required by Mr. Melhuish to wind his paper upon his rollers, which were fixed in the slide, seems almost inconceivable when viewed in the light of modern improvements. No one who

was present at the last meeting of the Photographic Society and heard the lucid description by Mr. Walker of the construction of the elegant roller slide he then explained, could for a moment close their eyes to the great value of the underlying principle involved in the invention of a roller slide, and a spool or roll of sensitive flexible photographic material which could be used in conjunction.

Without dwelling upon other features of this roller slide, such as the method of retaining the paper under a definite tension under varying atmospheric conditions (which was undoubtedly as radical an improvement as the other feature before referred to), the automatic marking of the limitations of the several exposures, and numerous other points alluded to by Mr. Walker in the course of his remarks, we close by expressing our sense of the great practical ingenuity displayed in this invention by our transatlantic friends.

ILLUMINATING NEGATIVES FOR ENLARGEMENT OR REDUCTION.

At the close of the outdoor season and at the commencement of what, so far as the camera is concerned, may be considered "the recess," it is but natural that lantern matters should assume a greater degree of activity than prevails during the spring and summer months, though even during those seasons the interest is never entirely dormant. As a consequence, at this period of the year, and each recurring year, with greater force we are inundated with correspondence relating directly or indirectly to the optical lantern, to exhibitions, and to lantern slides. This year it would seem that amateurs are more than ever engaging in the practice of making their own slides, and with the facilities at present within their reach, and the fact that the practice keeps them in training during the "off season," it is not to be wondered at.

At the same time and directly, in consequence of the greater number interested, we find an increase in the difficulty, or rather of the numbers who experience the difficulty, of satisfactorily lighting the negative for reproduction in the camera. Many amateurs who make a practice of enlarging from their negatives, and compass the task successfully and to their satisfaction, imagine that the production of the diminutive lantern slide is a far easier matter, and are consequently the more surprised when on attempting it they find their arrangements are unsuitable. As a matter of fact, the requirements are very different in the two cases and in some points nearly opposite.

Thus, in ninety-nine cases out of a hundred, an enlargement is made from a very small negative; in the case of an amateur

nearly always a quarter-plate. If the picture be a portrait, especially if a bust or vignette, only a comparatively small portion of the plate is required to be illuminated evenly, and an ordinary three-and-a-half-inch condenser, as supplied with the cheapest lanterns, or obtainable separately for a few shillings, supplies all the optical arrangement needful. Even should the subject be a landscape, and the plate have to be reproduced to the edges, a five-inch condenser will scarcely fail to cover it to the corners, and the cost of the larger optical arrangement is still insignificant. Portrait enlargements from plates of larger dimensions than quarter size present the same advantage in requiring but a portion of the centre of the plate illuminated, but of course where the subject is a landscape, and has to be reproduced to the corners, the difficulty in illumination is greater.

But lantern slides, except when printed by contact, are almost invariably reduced from larger negatives, and in nine cases out of ten the subjects consist of landscapes or studies which require the whole, or at least the greater part, of the negative to be illuminated with a uniformity that is scarcely needful under any circumstances in the case of a portrait. Supposing even that the negative to be reproduced is of the actual size of the required slide, and that the portion to be illuminated is a *circle* of three inches diameter, the three-and-a-half-inch condenser will scarcely accomplish the task set it; but if the shape be square instead of circular a four-and-a-half-inch condenser will prove insufficient. If, then, the difficulties of illuminating the smallest size of negative in ordinary use by means of a condenser be so great, what will they be as the sizes increase? Condensers, of course, can be obtained suitable for any reasonable size of negative, but at a cost that entirely precludes their use by the amateur, while the professional would dispense altogether with their use by adopting daylight, which, as a rule, the amateur is not in a position to do. This, in fact, constitutes the chief difficulty with amateurs; their engagements do not permit them to utilise daylight, and being compelled to employ artificial light the problem is how to distribute it evenly.

Many plans have been devised for utilising gas or oil lamps, but these have been mostly defective either in necessitating a large number of flames and a great amount of heat, or else, on the other hand, imperfect distribution and great feebleness of light. Of the first class the principle is a translucent screen, illuminated by a series of separate flames placed at such intervals and at such a distance from the screen that their light is equalised over a large area, and the translucent surface then becomes a radiant; or the arrangement may be varied by allowing the light from two or more flames to fall upon a dead white surface from different directions, so as to equalise one another as far as possible, and the reflected light allowed to fall upon the negative. This answers tolerably well for small pictures when rapid plates are used, but the loss of light is very great.

Other methods consist of the use of a single flame with a sheet of ground-glass, or other suitable medium, interposed between it and the negative, the uniformity of the illumination depending upon the relative positions of the light and the screen. Here it becomes a matter of compromise between quality of illumination and length of exposure, for the greater the distance of the light the better its distribution but the less its power, and in practice it is found that to secure even tolerable uniformity of lighting entails an exposure too prolonged for any but very rapid plates.

These remarks refer to gas or oil flames, which are of a comparatively non-actinic character; the oxyhydrogen is better, but seldom available, while the electric light of suitable kind is still further out of the question. But since magnesium has at last come down to so moderate a price, there remains no valid reason why a cheap, convenient, and highly powerful light should not be available for the purpose we indicate wherever lantern slides or enlargements are made.

The simplest mode of using it scarcely requires any apparatus or preparation, all that is necessary being to ignite it at a sufficient distance from the negative with or without the intervention of a translucent screen; or the light may be allowed to fall upon a white sheet and passed, by reflection, through the negative to the camera, in which case the perfection of uniformity is secured. But though these makeshift methods may answer very well for lantern slide purposes where the sensitive plate is exposed in the camera, and thus protected from extraneous light, for enlarging they are wholly useless, since the sensitive surface is usually freely exposed, and it therefore becomes necessary to enclose the light in a suitable lantern. This is not a difficult task, and as, with the aid of magnesium, it removes all the difficulty of equal distribution of the light without inconveniently lengthening the exposure, no doubt many amateurs, in addition to those who have addressed us on the subject, will think it worth while to erect a simple lantern on the lines of the one we shall describe.

This consists roughly of a wooden body with ground-glass front, and acts at the same time as lantern and reflector combined, the ground-glass intercepting the whole of the light both direct and reflected, and becoming converted into a powerfully actinic radiant suitable for either enlarging or reducing purposes and for negatives of any size. The details of construction are so simple as to scarcely require a diagram, so we shall endeavour, by means of a verbal description, to make the arrangement clear.

We may premise that though the instrument we describe is constructed for use with negatives up to 12 x 10, and is equally available for quarter-plates, it might be made of any smaller dimensions if preferred, though, as nothing is lost in the larger size, and little added to the cost, we should strongly recommend the twelve inch square front to be adhered to.

The shape of the lantern, or reflector, is a hollow pyramid, the base of which is twelve inches square, clear, and the sides slope at an angle of sixty degrees, which will make the height of the pyramid, roughly, between ten and eleven inches. Such are the interior shape and dimensions, but for convenience in construction, as well as in use, the structure may be built up in the following manner:—Cut two pieces of wood accurately to the shape and internal dimensions of the side of the reflector, and cut also two rectangular pieces of such size that, when placed together to form a V-shaped trough, the two triangular pieces will fit in at the proper angle to complete the reflector. The square ends of the two rectangular sides will then serve as feet, upon which the reflector will stand without further assistance. Before fastening the sides together, mark on each a line parallel with, and six or seven inches from, the front or base edge, and nail or glue on four fillets of wood to form a rebate or projection against which to fix a square of glass. In each of the triangular pieces which will form the top and bottom of the lantern when in use cut a hole an inch and a half, or two inches, in diameter for ventilating purposes, the upper one to be fitted with an external chimney to carry off the smoke.

When the frame is put together, let it be lined with white

paper or painted dead white; fit a square of clear glass into the rebate formed by the fillets already mentioned, and in the centre of this cement a disc of opal glass about an inch in diameter. The clear glass will convert the back portion into a separate lantern, and by reducing the space assist in carrying off the smoke, while the opal disc softens the intense brilliancy of the burning magnesium and helps to equalise the illumination. The front of the arrangement is provided with a frame into which a sheet of ground-glass slides, with a second groove at a distance of about an inch, into which carriers to hold different sized negatives can be inserted. So far as the lantern is concerned, nothing now remains but to supply the illuminating arrangement.

This is of the simplest. Procure two narrow brass tubes, five or six inches in length and an eighth of an inch in internal diameter. Saw off the apex of the pyramid and replace it with a flat piece of wood through which the two tubes are passed, one a quarter of an inch above, the other a quarter of an inch below, the centre and reaching to an inch or so of the clear glass screen, or eight inches from the ground-glass front. The upper tube serves as a guide for the magnesium wire and may be replaced, if it be at hand, by one of the simple little lamps supplied by Mr. F. W. Hart. The lower tube carries a strand of cotton wick kept saturated with spirit, and serves to light the magnesium as it is passed through the upper tube. If the outside end of the wick tube be bent at a right angle, it may be passed through a cork into a small bottle of methylated spirit and so converted into a permanent spirit lamp. A small aperture cut in one of the sides and glazed with blue glass will enable the operator to watch and regulate the supply of magnesium during use.

When required for work, all that is necessary is to light the spirit lamp by passing a taper through the air inlet at the bottom and to allow that to burn continuously. When an exposure is to be made a strand of magnesium ribbon is passed slowly, but regularly, through the upper tube, and being ignited by the spirit flame, continues to burn as long as the supply is kept up. If the reflector be constructed of the shape and angle given and the light arranged at a distance of eight inches from the front glass, the illumination over a surface of a foot square will be brilliant and uniform in the highest degree.

Not the least recommendation of this apparatus beyond its efficiency is its economy. It may be made by any one who can use tools at all, for a few shillings, and will serve a variety of purposes.

RESPONSIBILITIES OF PLATE MAKERS.

THE question has been raised by one of our correspondents as to whether an action could not be raised against a plate maker who supplies plates which in the hands of the purchaser and user turn out badly. Now, if one thing is, or ought to be, better understood than another it is this, that in the hands of one man a plate may often fail entirely in the production of a good negative, while one from the same packet will, when manipulated by another individual, prove to be all that can be desired. All depends upon the treatment. A plate maker, for his own sake not less than that of the user, will necessarily allow nothing except what he believes to be good and reliable to be issued with his insignia as an endorsement of such belief: it would prove fatal to his interests were it otherwise.

There is no one worthy of the name of a photographer who has not, at one period or other of his career, encountered failures which he afterwards realised were due to himself. We

quite grant that it is inexpressibly annoying and vexing to find, after returning from a long journey, that upon developing his plates, each, one after another, turns out to be weak, foggy, or otherwise bad. Of course the maker of the plates is blamed, and the question is ignored whether by the exercise of a little judgment in developing, in contradistinction to a blind mechanical adherence to formulæ, the result might not have been altogether different.

One instance, and it is an excellent one, illustrative of what we have said is to be found in a paper read by Mr. F. C. Beach at the last meeting of the Society of New York Amateurs. Mr. Beach read a letter from a correspondent, in the course of which he (the correspondent) cites things which would have borne very hard upon the maker of some plates he had used. The story is briefly thus: The gentleman in question had had a most untoward experience with his plates that were specially prepared for him. They turned out to be, he said, "a sad disappointment." The gelatine dissolved off in the developer in spite of ice. There was no frilling, but the film simply soaked off, leaving a large margin as clear glass. But he then put on his considering cap, and having left six of the quantity undeveloped he treated them with a developer differing from that hitherto employed. Although it does not bear upon the principle of the question now under discussion, we give his last thought of developer:

Ferrocyanide of potassium ...	1½	ounces	avoirdupois.
Carbonate of potassium	1½	"	"
Carbonate sodium (dry)	1	ounce	"
Sulphite sodium crystals.....	2	ounces	"
Hot distilled water to make...	10	"	"

This proved very energetic in its action, half as much as the usual amount of potash solution being sufficient to easily develop the plate, while it was advisable also to employ a few drops of a ten per cent. solution of bromide of potassium to restrain.

With this modification he succeeded in obtaining from the six plates fine "snappy" negatives, free from the annoying fog that had spread over all the other deteriorated plates, with clear shadows and the high lights of that soft creamy grey that so delights the eye and prints so well in the wet-plate process. If potash and soda are alone used, the film seems to possess a cold, hard, grey colour, but the addition of ferrocyanide appears to give it a warmer, creamier grey. This formula, it seemed to the writer, should be further experimented with.

Now, this is a case that is directly to the point. The same plates which had produced fog and other evils, when thoughtfully treated yielded snappy negatives, having clear shadows and excellent high lights.

We might say much more relative to this, but it is not necessary. We know a good deal concerning the care exercised by plate makers both in this country and America to ensure the best possible class of production finding its way into the hands of the consumer; and, from what we know, we think it would be an exceedingly ill-judged action to hold them responsible in a court of law for deficiencies in plates which, if traced to their sources, would be found to be due to the operator.

SOME months ago, in our issue for April 29 of the present year, we called attention to a method of intensification by means of gallic acid and silver, introduced to the members of the Philadelphia Photographic Society. This process, which proved an absolute failure in our hands, presented certain anomalies which led us to believe that it had been incorrectly reported, or that some essential step in the

operations had been omitted. From a report of the last meeting of the Philadelphia Society, however, we see that the same process has been again on the *tapis*, and that it remains in a practically unaltered form. The strength of the stock solution of gallic acid is reduced one-third, and the composition of the preliminary acid bath is changed slightly, but for all practical purposes the process remains the same, and in the hands of some of the members of the Society is said to work well. We shall be glad to hear the experience of others on this side. Meanwhile we reiterate the doubts we previously expressed as to the practicability of the method. The strength of the gallic acid solution, even as reduced, and the quantity employed, are abnormal, while the acidification of the film itself instead of the gall-nitrate solution, seems to us scarcely conducive to clean and successful intensification.

Those who wish to secure autumnal effects in foliage should lose no time in obtaining them, or it will soon be too late. Although many of the trees in the immediate neighbourhood of London have lost their leaves, this as yet is not the case in country districts. If photography could but render the glorious tints now to be seen whenever the sun is shining on the trees, what magnificent effects might be secured. Orthochromatic plates will, however, aid considerably in rendering the delicate tints in their true relation. A few days back we were shown some views, taken in duplicate, on ordinary and on orthochromatic plates, and the distinction was very marked indeed. Those on the ordinary plates showed but very little difference, if any, in the variety of tints on the leaves, as, for the most part, they appeared of one uniform tone—the pale yellows and the darker colours being about equal. Not so, however, with the orthochromatic plates, for in these there was a well-marked distinction, and they depicted the varied tints in something like their proper relation. Even orthochromatic photography still leaves much to be desired in rendering the gorgeous autumnal effects, yet, on the whole, it cannot be denied that it is a vast improvement.

As the lantern season is now fast approaching, amateur photographers will be setting to work to prepare slides from the negatives taken during the past summer. Many are, doubtless, at the present time undecided as to the process they shall employ. Those desirous of avoiding all the trouble possible will probably adopt one or other of the commercial plates sold specially for the purpose. These will certainly—or at least such of them as we have tried—yield excellent results. Some, however, who do not mind a little extra trouble, will, perhaps, prefer collodio-bromide; and it must be admitted that, during the last few years, some of the best slides which have been shown on lantern nights at the Metropolitan societies and clubs have been by this process. Amongst amateurs, the wet collodion process, which, by the way, is capable of giving admirable results, now finds but little favour; and, except for making slides on a commercial scale, we suspect it will be but little used in the future for lantern pictures.

If it were not for the trouble involved in the preparation of the plates—after all, it is more imaginary than real—we suspect the albumen process would be more extensively employed than any other. It is the first process by which lantern slides were made, and for quality, and the variety of tones obtainable, it has never yet been surpassed. Compared with purchasing plates ready for use, of course, the albumen process does seem troublesome, as it involves several operations before the plate is ready for exposure. First there is the preparation of the albumen; but this a very simple matter, and sufficient may be prepared at a time to last many months. Then there is coating the plate with collodion, washing it, and then applying the albumen, and afterwards drying it. Next the plate has to be sensitised, washed, and again dried. The development differs somewhat from that of dry plates generally, although it involves but little more trouble, while, at the same time, it is more completely under control. The toning of the transparency does not differ materially from toning paper prints. The foregoing brief outline of the process may make it look complicated, but, as we have indicated before, it is not really so in practice, as all the work, up to the final sensitising, can be done in open daylight. If good albumen plates were, like gelatine ones, articles of commerce, we doubt not but that they would be

extensively employed by amateurs. Until they are, we surmise that only a very limited number will, as hitherto, go to the trouble of preparing them for themselves.

THERE are to be seen in many of the shop windows of these who make a speciality of the portraits of actresses some novel, unique, and somewhat eccentric examples of lighting the sitter. In some of these the model is lighted, for the most part, from behind, in others from the side and back, and in some from the top. In many of the pictures there is evidence of artistic treatment, but in others the reverse—novelty evidently being the end sought for rather than art. When the late Adam Salomon's work, which owed so much to the skilful lighting of the model, was first shown here, most of our older readers will remember the rush that was made for similar effects by some English operators—and the result. Again, when the so-called Rembrandt lighting was introduced, what libels on that famous artist's name were produced—and, for that matter, are still—by unskilled operators. It is to be hoped that the peculiar lighting to which allusion has been made will not be emulated, except by those who possess some artistic knowledge, otherwise it is impossible to speculate on the monstrosities in photography which we may ultimately have inflicted upon us.

It cannot be too strongly impressed upon all who aim at permanency in gelatino-bromide paper pictures the necessity of thoroughly freeing the prints from all traces of acid before they are immersed in the fixing bath. Unless this be done—and done completely, too—sulphur compounds will be formed in the picture, which no amount of after washing will eliminate, and which, of course, will considerably jeopardise their stability. We once more recur to this subject, as we recently saw some pictures being made in which this precaution was completely ignored. The prints, after development, were simply rinsed in the most careless manner possible, and then transferred direct into the hyposulphite of soda solution. Here they were allowed to remain for such a time as only sufficed to remove the bromide. If bromide pictures are made in this perfunctory manner, who can wonder if, after the lapse of a year or two, they show symptoms of evanescence? Most careful operators now consider that gelatine negatives should be left in the fixing bath for a much longer time than is actually required to dissolve out the unaltered bromide, in order to secure permanency. Surely, if this necessity exists in the case of negatives, it exists to the same extent in the case of paper pictures.

THE PHOTOGRAPHIC EXHIBITION.

V.

CAPTAIN ABNEY, R.E., F.R.S. (Nos. 307 to 312), *Merligen Thunersee*.—This is one of six exceedingly interesting views in Switzerland, because they show something else besides the tops of mountains, and help to convey a most satisfactory idea of the locality. In these pictures this seems to have been the intention, and well has it been carried out. Snowy distances have been contrasted by masses of near dark objects, and very beautiful and delicate work pervades the series, both photographic and pictorial.

T. M. Brownrigg (Nos. 316 to 322), *Goschenen*.—This picture of Swiss scenery contains some good points of treatment in development, although pictorially it is merely a transcript. No. 321, *A Bridge at Florence*, becomes another valuable record of the olden time when houses were built on bridges; it suggests a gloomy period of time, and has a "Canaletto" look about it. The other pictures are not quite up to that quality of work which this indefatigable exhibitor has of late years produced.

Robert Faulkner (Nos. 327, 328), *Portraits*.—Two frames of children, one with silver prints, the other with red. The same quality of work is here shown with which we have been familiar for many years past, soft and delicate in treatment; but the subjects are not so young as they hitherto have been.

G. Watmough Webster (No. 334), *Skylarks*.—We notice this picture simply to remark that photography, which attempts the copying of almost anything, is a little beyond the mark in attempting

to represent a scene which is not a fact. The picture, which is rather large, represents a skylark actually flying down from the sky to its mate in the nest. It is very cleverly arranged, but it would have been far more effective if a darker background had been introduced, otherwise the picture is very unique and attractive.

R. H. Lord (No. 338), *Osier Peeling*.—This is another direct large picture in platinotype, and technically is very good. It is simply a record of facts, a woman peeling an osier, and makes no pretensions on the art side. The whole work suggests how very useful photography can be in conveying correct notions of many industrial operations. We can imagine how deeply interesting a collection of such pictures would be, and it would be wise if photographers would assist in this direction.

W. Cobb (Nos. 339 to 346), *Views of London*.—These are most certainly the best instantaneous photographs ever produced by this exhibitor, who has made this work his speciality. Two points arrest our attention in these interesting views in London—one is that the point of view has been most carefully studied and selected, the other is the atmospheric condition, which has also been well chosen; the result is a series of very choice and effective bits of the Metropolis. There is one outcome of these instantaneous photographs which is curious, it is that moving figures seem as if they were suddenly arrested in the act of gliding, arising from the suspension of that undulatory movement which belongs almost exclusively to Man.

G. P. Cartland (No. 348), *Cattle*.—There are several photographs of bulls in this frame, which have been very well managed, being rather difficult subjects; and a matter which should be especially studied is the background where buildings are used, sometimes dark portions of which seem to belong to the animal.

Simeon Norman (No. 349), *Studies*.—The title is quite correct. These are pretty bits, not pictures. At the same time, the technical treatment is so perfect that we can only hope to see in the future the same good result in connexion with works of a much more ambitious character.

Seymour Conway (No. 350), *Views, North Wales*.—Here we undoubtedly have pictures, from the nature of the extent of subject matter included, and the points of view have been well chosen with regard to effective foregrounds. The outline of the distant mountains is rather hard; this detracts from their otherwise almost perfect rendering, and from the juxtaposition of each picture, there being four, they would have been increased in value if each had had its own frame. Why do not exhibitors consider this matter?

R. B. Berry (No. 351), *River and Waterfalls*.—Six small pictures exceedingly good in their technical treatment, considering the very short exposure each must have had to produce so free from white patches the various falls of water, both near and distant. If similar work could be obtained in photographs double the size some charming pictures would be the result.

J. Blain Scott (No. 353), *Miss Fales*.—Another large direct portrait, the pose and arrangement of lines of composition being very nice and satisfactory. It is printed in a very good black platinotype colour, but we fancy that the background is a second printing from the light halo which follows the outline of one side of the figure. This almost discounts the good there is in the picture.

Henry Aubrey (Nos. 355, 356), *Babies and Animals*.—Two frames of difficult subjects. In the instance of the "Babies" we notice that the pose has been very carefully adapted to the social individuality of each little one, with the result of pleasing naturalness. In the animals we particularly observe the standing out of the subjects from the backgrounds and the perception of the right moment of time when to photograph the object, which implies a quick artistic instinct.

Robinson & Thomson (No. 360), *Pisa*.—A frame of fourteen very small photographs of Pisa. There are also two other frames on the walls of views in Italy, containing forty-eight subjects. All these can only be regarded as very pleasant mementoes of deeply interesting places where photography by its realistic capability takes away much of that sentimental halo which artistic individuality has so often given to places of historical interest; yet at the same time these little pictures confer a vast amount of pleasure, because each observer can now exercise his own individuality of sentiment.

William England (No. 362), *Street Views of London*.—This frame and two others contain small photographs taken from a tricycle.

Here we have work by this well-known exhibitor which constitutes a departure from his usual Swiss scenes. The realistic part has been enriched by choosing moving objects, when they were in a position to add increased value to the streets and buildings depicted.

Benjamin Wyles (No. 369), *Sea Birds at Home*.—A frame of several photographs of sea gulls taken whilst flying. Really at this advanced stage of rapid dry plates and appliances there can be nothing very extraordinary in giving rapid exposures. Now if these birds could be taken with the light behind the camera with some dark clouds, causing them to be much lighter, then possibly something approaching the artistic might result; at present these birds are not of much value.

Dr. P. H. Emerson (No. 402), *The Poacher*.—There is a great amount of thought in this photograph. Just as the dawn is breaking a poacher stands, with hand on his dog, just ready to urge him on the instant the coveted object is visible. The poacher's head rises just above a very high horizon into the lighter sky, all the other parts of the picture being kept to one uniform tone, which is very low. All this suggests a kind of monotony which, however true in real life, is not very pleasant to contemplate; and, after all, the truth involved does not seem fitted for photographic production, because it is hardly possible that any photograph at all could be taken at that early time of day. However, let that pass. In all these attempts at low toned pictures we cannot but miss the suggestive influence of colour, and, therefore, we think that sentiment should be attempted more on the side of brightness rather than darkness. This picture, to which a medal has been awarded, has been printed in platinotype.

J. B. B. Wellington (No. 412), *Studies*.—Eleven small studies are comprised in this frame. They are all very well chosen; the size of the figures, to the amount of the surrounding objects, is exceedingly good. This is a matter which is not so much thought of as it ought to be, and, therefore, the more to be praised when we find it. Hence these photographs are real studies, because much thought has been given them. They are in platinotype, but the colour is not pleasant. Also if some of these pictures had been warmer in tone they would have been more artistic. A medal has been awarded these photographs.

Payne Jennings (No. 421), *On the Norfolk Broads*.—Another series of ten platinotypes. It is a long time since any work by this exhibitor has been seen at the Society's Exhibition. We welcome his return, but at the same time we feel that these pictures before us do not quite satisfy our expectations. The scenes chosen involve, in many of them, the leading line becoming almost a straight horizontal one, and as these ten pictures are mounted very close together, they run one into another. Photography this year has leaped up so much in its art side that these subsidiary (although at the same time powerful for good or evil) matters must have closer attention given them. We again think that the same colour is not appropriate for every picture.

School of Military Engineering (No. 425), *On the Thames*.—Three views in platinotype. The standpoint of view is not so good as it might have been, and we think that the charm of the original scenes is owing to their colour, which becomes lost when rendered in monotone, and that of a steely grey tint.

G. Renwick (No. 431), *Will it Bear?*—This is one of those wintry snow pictures which this exhibitor is making his special study. At all times they are very difficult to treat, and possibly when done are not always appreciated. Here we have an intention in relation to a wintry day which is appropriate. Distant trees in mist, a frozen river, two boys on a snowy foreground, suggest the title. Technically this has been well carried out, and appropriately printed on bromide paper.

Edmund Hyde (No. 437), *View on River Kid*.—Although this is an enlargement, yet we notice the picture on account of its evidencing some thought in selecting the point of view. The buildings and detail are commonplace, but a good effect has been obtained by bringing in a tree on one side which gracefully harmonises with the other parts and makes the distance retire.

Captain Abney (No. 439), *A Chill November Day*.—This is an English scene on a river, and the quietude of everything depicted makes it expressive, which is intensified by being in platinotype of a grey tone. But there is one drawback, and that is, some stems of a pollard-tree are all equally cut by the top line of the picture. This

might have been avoided by making the picture an upright one, where the stems naturally would get smaller in size.

J. Blain Scott (No. 451), *Study from Life*.—This is a very good attempt at making a picture out of a single figure, the pose, profile face, and nearly back view being very effective; but where the lines of the figure are equal in extent, then the background must be well arranged so as to carry out, harmonise, or contrast with the figure lines. Now this has not been attended to in this picture, and we therefore have three sections, viz., one central figure and two background bits. One single large leaf touches the figure. Why were not other large leaves introduced, which would have assisted the composition?

B. G. Wilkinson (No. 475), *Fishing Boats*.—Three very pretty small pictures, where selection of the position of the vessels has been very artistically studied. These photographs are very luminous. Indeed, it appears that all this class of subjects are well adapted for photographic purposes, owing to the reflective power of the water, which confers such a bright effect when technically well treated, as these pictures are. There is also another frame (No. 476) by the same exhibitor, containing four landscapes with figures. These are well selected, and remind us of the work of a well-known exhibitor.

John Terras (No. 492), *Darning*.—A photograph like all the work hitherto shown by this exhibitor, where everything has been sunned down to a very low scale of tone, except the face, upon which the eye always rests. This is very much after the style of the Dutch painters of *genre* pictures, but, as we have frequently observed, a great compensatory balance has been effected in painting by colour, which idealises the commonplace matter, but which is not realised in photography. There is much thought and skill involved in the picture before us, nevertheless it is rather gloomy in result.

THE APPARATUS.—IV.

A LARGE and imposing show-case of lenses on the table bear the names of T. S. & W. Taylor, Leicester (not Manchester, as wrongly given in the catalogue) as their makers and exhibitors. The casual visitor may look at but he cannot handle them, as a plate of glass intervenes between these optical treasures and meddling fingers. This is always a wise precaution to take where lenses are concerned, not alone because there may be an occasional visitor whose ideas of *meum* and *tuum* are loosely defined, but also because it is an almost invariable habit of the mere *dilettante* loungee at such an exhibition to rub his or her fingers over the surface of the polished glass with an admiring observation as to "how very smooth it is!" More fortunate than the class referred to, we have been afforded an opportunity of submitting these lenses, through the mediary of one of them, to any practical test we cared to apply. Our remarks at present apply to one of the rapid doublets of the Steinheil type. It is composed of two identical combinations, and thus being symmetrical with Waterhouse diaphragms midway between the two, it is rectilinear.

Having an equivalent focus of thirteen and a half inches, and working with the full aperture, and the lenses being one inch and three-quarters in diameter, it goes without saying that it is quite entitled to be termed "rapid," more especially as the glass of which the lenses are made is colourless, and the surfaces well polished. The diaphragms are stamped both with the "*f*" system, and with the Standard or U. S. System of the Photographic Society, and range from $\frac{1}{4}$ —4 up to $\frac{1}{16}$ —256. It needs only to add that the definition with full aperture is most excellent. It is for 10 × 8 plates.

The exhibits of Messrs. Watson & Son embrace a novelty for retaining the shutter of the dark slide closed. It consists of a brass spring lying across and outside of the part of the shutter which has to be laid hold of by finger and thumb. Now if we consider that it is impossible to grasp the projection without pressing upon the spring, and if we further consider that a projection on this spring, formed by bending it over at a right angle, catches underneath the shoulder of a screw in the slide, it will be readily conceived that the mere act of drawing out the shutter releases the catch by which it is otherwise retained in its place. All these being outside of the dark slide, no cutting into the latter is necessitated, and consequently no admission of light to the plate can take place.

This arrangement for securing the shutters is a great improvement, as regards convenience and security, on the pieces of bent wire

ordinarily used to prevent the shutters from unexpectedly sliding out, and cannot fail to recommend itself to all photographers. It is also a great advance on any other kind of spring hitherto made in this country, inasmuch as it does not require any portion of the frame of the slide to be cut away to attach it, but is fixed quite on the outside of the frame.

Another novelty of the Messrs. Watson consists of check pieces screwed on the shutter in such a way as to project in the groove in which the shutter slides and catch against pieces fixed in the groove. The effect of this is that there is no projection whatever on the face of the shutter, as in those in common use, and which necessitates this dark slide being a little more bulky than there is a real necessity for.

EVERY AMATEUR HIS OWN PRINTER.

AN old exhibitor at a certain Society which I will not specifically name, recently complained that the bad quality of his prints lost him a medal. How far correct the assumption was it is, of course, impossible to estimate; but one thing is very sure, namely, that if this gentleman, instead of "putting out" his printing as if it had been washing or mangling, had spared the time to do it himself, there would probably have been no excuse for grumbling at anybody's expense but his own. As we have again arrived at the period of the year that ushers in the time during which the greater number of photographic exhibitions take place, the occasion may perhaps serve for directing renewed attention to a subject of such supreme importance as the printing from amateurs' negatives.

It has been a reproach often enough levelled at non-professional workers that they are addicted to shirking what is, all things considered, the most difficult department of photography—the most difficult, that is, because it calls into exercise the utmost nicety of judgment and taste. That reproach undoubtedly has a respectable substratum of truth about it. The endeavour to set up a justification for it does not, however, fall within my present scope, unless I may premise with Mr. Dunmore, in his admirably digested article entitled *Photography and Photographers*, that this same department of printing is a succession of operations, the importance of which is not so generally appreciated as it should be; or with Mr. Bolton, when he truly remarks upon the scanty number of negatives that are worth printing from. Still, there is one point in this connexion to which I would, in passing, refer, and that is the extreme likelihood that with the majority of amateurs the labour and pains necessary to securing a passable negative are so exhausting, that they find it easier, cheaper, and occasionally more satisfactory—save in such instances as I have quoted—to delegate the printing to those who specially cater for that class of work. At the same time, while it is indubitable that it is only the few among amateurs who do their own printing in its entirety, it is just as certain that a large number of professionals habitually resort to the good offices of the trade printer, so that in reality the reproach covers a larger area than is generally admitted. There is, however, this difference in the end attained, although the means are coequal, that a professional photographer's negatives, being chiefly portraits, seldom, if ever, err greatly either on one side or the other of a certain fixed standard of printable quality, and that in the ordinary circumstances of commercial dealings with the trade printer, the photographer is not slow to reject prints that betray a lack of uniformity or any technical defect; whilst the amateur's negatives are, by comparison with the professional, few and intermittent, of variable density, and, in many cases, utterly worthless unless specially treated by the printer and given, what in the ordinary course of things they rarely receive, individual and particular attention.

With many amateurs it is customary to take prints from their negatives and get the printer to tone them. This class seems to be on the increase. Of course time and trouble are saved, but I maintain that such a method is opposed to the cultivation of just those qualities that go to form the finished photographer; for unless a man can print and tone, and, what is more, exercise at command the latitude of power contained in those operations, he can have little or no legitimate claim to the title. There is also another class which has been assumed by many to be nearly, if not quite, extinct, namely, amateurs who merely expose their plates, and get somebody else to develop the

negatives and print from them. This is photography made easy with a vengeance. One has no right to quarrel with amateurs of this kind, for this is a free country and it makes it good for trade, although any one such must have considerable applause and much faith in the credulity of his friends to dub himself an amateur photographer. The class of semi-photographers who avail themselves of other people's skill and abilities numerically the strongest, is that whose members do everything but the printing. Besides these there are others who make the reduction of labour a life study—in particular, those who never even fill their own slides when they can help it. A gentleman of this description (an eminent lawyer) was once going abroad, and, amongst other things, commissioned his dealer to fill his slides for him. The matter was overlooked, and the Q.C. did not find out the omission until he was seven thousand miles away. When he came home he wrote an indignant letter to the papers. This is one of those small things that are best done by one's self. And so it is with printing, although that is not a small thing—far from it.

Amateurs' negatives, as I have already said, are generally of variable qualities. As a rule, they require to be watched. Now, trade printers like watching negatives about as much as the small grocer likes selling you a pound of sugar without any tea—it doesn't pay. A man with a hundred and fifty frames to attend to isn't likely to neglect a hundred and forty-five of them containing good negatives on purpose to devote an unreasonable amount of attention to the remaining five. He lets them take their chance, I imagine, for photographs are not like the ninety-nine sheep—they won't stand still while search is being made for the stray. Some negatives are so dense that they want four or five days, say, in autumn, to give one print; others are so thin that they can only be printed in a certain light and behind screen of tissue paper; others have to be done sectionally, such, for instance, where there is plenty of detail in the middle distance whilst that in the foreground has not been developed out. To mention the broken negative from which a print *must* be got by hook or by crook is to raise dismal recollections in the mind of the trade printer, I'm afraid. There are also negatives from which not even the surface hypo has been removed; others that have markings and scratches which must upon no account appear in the print—finger marks, streaks of fog, stars, and all the rest of the long train of diseases to which many amateurs' negatives are subject, and from which those of professional men are, as a rule, entirely free. It will thus be seen that, although in the trade there are many printers who lay themselves open to print for amateurs, it is a department of photographic industry which is not so satisfactory as it might be—especially to the printer.

That amateurs are often dissatisfied with their prints as received from the trade printer is one of the most cogent arguments I could select in support of the advocacy that they should do their own printing, just as they select their own subjects, make their own exposures, and do their own developing. Of course there are occasions when it is imperative that they should seek outside assistance, as, for instance, when a large number of prints are required in a hurry for a bazaar or a presentation, &c., but even here, by the duplication and multiplication of the negative, it might be often found practicable to dispense with the aid of the professional printer. In general, however, it may be laid down that the more an amateur relies upon himself and his own powers, latent or otherwise, the less his ultimate dissatisfaction is likely to be. I do not say that he will prove, *pari passu*, one whit better or cleverer than the man who has to get his living by printing. What I do insist upon, however, is that he can afford to give the time, the attention, and the particular treatment demanded by them whilst his prints are in progress, which the professional man cannot. In the case of dense and thin negatives, such attention is vital to the success—the proximate success—of the print. The best and most accomplished amateurs amongst us—those whose names will readily occur to memory—would as soon think of turning over their printing to anybody else as they would of handing the keys of their dark rooms to a domestic with a request that she would step up and develop the plates exposed last month in Switzerland. It seems to me that not sufficient stress is laid upon this important branch of photography; that, in fact, we haggle so much over the quantitative constitution of a formula for development, &c., and are so prone to regard a good negative as the aim and end of all our efforts, that the after process of printing is left to

take care of itself, which, as it comes at the tail of a lot of other operations, is a very poor care indeed. That, by comparison with the number of even good negatives that are produced the number of prints is amazingly small, everybody knows. There is, none the less, obvious room for improvement in the prints we do permit ourselves to take, and the way to bring it about is not by placing the matter in the hands of a second person whose interest in the results is justly only gauged by a pecuniary measure, but by adopting the course of procedure most common in the cases where one wants a thing done well and doing it one's self. Printing from the negative is not easy if good results are sought for, and like everything else from which an ultimate measure of satisfaction is desired, it demands time, care, and attention. And as it is unreasonable of us to expect the trade printer to devote a larger *quantum* of these great qualities to us individually than is commensurate with the extent of the orders with which we favour him—which are generally ludicrously small—the readiest solution of this, an old difficulty, is to make up our minds to do our own printing—and to do it.

MARSTON MOORE.

THE GALLIC ACID AND SILVER NITRATE INTENSIFIER,
—HYDROKINONE AS AN INTENSIFIER.

[A Communication to the Photographic Society of Philadelphia.]

THE best method of obtaining the proper density in a gelatine negative is undoubtedly proper exposure and development. But even the best manipulators will sometimes be deceived in the printing qualities of a negative, and I believe most all who have used the wet plate process have often longed for some intensifier like the old iron and silver, or pyro and silver, and no doubt many have tried to intensify gelatine negatives by the same method, but encountered the disagreeable foe, red stain, and abandoned its use.

Now I feel convinced, from a number of experiments made, that iron, pyro, or gallic acid and silver can be used without any danger of staining if the film is thoroughly washed and rendered slightly acid before attempting intensification. If the plate is bathed in the iron and acid, pyro and acid, or gallic acid and acid solution for a few minutes, and the solution then poured back into the graduate and the silver added and flowed back over the film, there will be very little danger of staining. Nitric, acetic, or citric acid can be used with either of the above reducing agents.

By this method a negative can be strengthened before fixing as well as after. In the first case the plate should be well freed from the developing solution, in the latter case thoroughly washed to remove all traces of hypo. To intensify a negative before fixing can only be necessary when handling plates extremely poor in silver, as otherwise the desirable strength can be obtained in the development.

Now to come to the gallic acid and silver intensifying process published by Mr. Bartlett and Dr. Wallace, I must say that after many experiments in this direction, I have adopted the same, as it has proven the best of all in my hands.

By using the preliminary bath of

Perechloride of iron	4 grains,
Chromic alum	2 "
Citric acid	4 "
Water	1 ounce,

we have at once a clearer, an acidifier, and a destroyer of the last traces of hypo.

The perechloride of iron (Mr. Bartlett's suggestion) has been added mainly for the last object, and also to improve the resulting colour of the negative. In ordinary temperature double the amount of citric acid can be used and the alum dispensed with. In extreme warm weather, and when dealing with plates inclined to frill or soften, it is best to pass them through an alum bath and to dry them before subjection to this process.

Attention should be paid not to carry the intensification too far, as the negative will gain intensity on drying. The negative should not remain too long in the preliminary bath, so as to allow it to bleach, unless handling a negative slightly fogged or over developed; in this case it is advisable to permit the plate to slightly bleach. The dish containing the solution should be gently rocked to prevent a net marking, which otherwise is apt to occur.

After taking the negative out of this bath, it should be well washed for several minutes under the tap, and the gallic acid and silver, as per formula, flowed over it:—

A.	
Gallic acid	80 grains.
Alcohol	1 ounce.

B.

Silver	40 grains.
Water	1 ounce.

One drachm of each to two to three ounces of water.

When the negative has been allowed to bleach, intensification will have to be carried further, as the underlying image has been converted into a chloride of silver, and consequently would dissolve in the subsequent hypo solution. By carrying the intensification just to the right point, the negative, after leaving the hypo, will prove free of fog, and have brilliant lights and clear shadows. Sometimes it will prove advantageous to flow the negative, when taken out of the fixing bath, with the clearing solution. It is needless to say that the plates should be well washed.

Recently I have made a few experiments with hydrokinone in place of gallic acid:—

Hydrokinone	60 grains.
Nitric acid	2 drops.
Water	6 ounces.

Half an ounce of this diluted with two ounces of water, and one drachm of silver solution added. Plate also previously acidified.

The action of this intensifier is somewhat slower, but the resulting colour of the negative is a rich black in the opaque parts, and even a plate, pyro stained to the colour of a lemon, was converted into one of a rich grey after subjection to this intensifier. I believe hydrokinone and silver will prove an excellent intensifier and toner for window transparencies.

JOHN G. CASSEBAUM.

THE AMERICAN ECLIPSE EXPEDITION IN JAPAN.

AFTER several weeks of travelling in the interior of Japan I find myself at Shirakawa, which is the station selected by the Americans for the eclipse expedition. I am not aware that any one is sending any account to the English photographic papers of the arrangements made here. I therefore write a few lines, although the prospect at present—about two hours before the time of totality—is very poor, the sky being completely overclouded.

The American expedition is under the direction of Professor D. P. Todd, of Amherst, who is assisted by Professor Hitchcock of the Smithsonian Institute, Dr. Holland the naturalist, Dr. King—a lady graduate of the New York Medical College for Women—and various others. It is by the kind invitation of Professor Hitchcock that I am here. As Mrs. Hitchcock and Mrs. Todd take part in the work, it will be seen that the Americans fully appreciate the assistance that can be rendered by ladies in scientific work. The site selected for the temporary observatory is an old Japanese fort or castle built on a piece of rising ground. It, as well as the whole country around, is remarkably picturesque, but as I shall have something to say of both in a general description of my travels through the interior of Japan, which I hope to have the pleasure of sending to England before very long, I give no description of them here.

The greater part of the energies of the expedition are concentrated on obtaining large photographs of the corona during totality. The members of the expedition have been fortunate enough to secure a lens of very great focal length. It is a single combination, presumably formed after a telescope formula. The diameter is very small comparatively, only about six inches, but the focal length is about forty feet. As every foot of focal length gives rather more than one-tenth of an inch diameter of an image, the subject got by this great lens will be rather more than four inches. The arrangement of the apparatus is as follows:—The lens is at one end of a horizontal tunnel, and at the other end is built the dark room. This is roomy, contains developing sink, &c., and a stand opposite the end of the tunnel for receiving the sensitive plates. This is, of course, capable of adjustment. There is an arrangement within the dark room for opening to make the exposure, so that everything except the heliostat which keeps the image of the sun directed on the lens is within control of the operator in the dark room. The stand for the plates being within the dark room there is no need to trouble with dark slides, &c. A plate is simply taken from the bath and is placed on the stand.

I should mention that Mr. Hitchcock has elected to use wet plates. He considers that even with the small aperture of lens he has (say $\frac{1}{6}$), the exposure on them will be ample.

I have seen images of the sun taken by the instrument. These are very good, but show a just perceptible falling off of sharpness at the edge of the disc. This, I was told, is due to want of perfect atmospheric clearness. Probably it is, but in Japan a factor must be reckoned with, which possibly is peculiar to the country. Professor John Milne, F.R.S., who has done more than any other to investigate the

subject of earthquakes in this country, has discovered that there is a variable but almost continual earth vibration quite strong enough to be recorded and measured by delicate instruments. Of course this must somewhat interfere with the definition given by the very best long-focus lens. I believe this remarkably interesting phenomenon has been investigated so far only in Japan, so that it is not yet possible to say whether it is of volcanic origin, or whether a vibration so great as to be readily recordable exists on all so-called "firm land." Professor Milne's own opinion is that it is due to wind—a vibration being first produced by wind on mountains, and afterwards conveyed through the earth. If this is the case the phenomenon will probably be found to be common to all mountainous countries. May it be that this factor, so far as I know not yet taken into consideration by astronomical photographers, accounts in whole or in part for the great rareness of a successful photograph of the moon on any large scale?

At the temporary observatory here, both the objective and the stand holding the plates are placed on solid foundations made of great blocks of granite, so that all possibility of vibration has been avoided so far as possible. Besides this forty-foot telescope, a smaller one of about ten or twelve feet focus is directed towards the position that the sun will occupy during the eclipse. It is proposed, with this, to make very short exposures, so as to show the phases before or after totality. Several appliances were fitted up to investigate the distribution of light in the outer corona. The smaller of the two telescopes was fitted with one of these. The arrangement is one whereby a plate is exposed with in front of it a sheet of tin perforated with a number of small holes, it being considered that the variation of density can better be judged of by observing the small spots thus produced, than by examining the gradation of density that would result were no perforated sheet interposed. There was, however, fitted up a pair of cameras side by side, one provided with the perforated sheet, the other without it, so that judgment might be made in either way as desired. In the case of these cameras, as no fine definition was required, single lenses somewhat after the nature of condensers were used.

One more observation was attempted. Its object was to decide the amount of light during totality. Two appliances were fitted to accomplish this. One consisted simply of a series of apertures of the same size arranged in front of a sensitive plate. These apertures were to screen exposures of different lengths by opening a shutter in front of them, withdrawing it so as to expose first one aperture, then, after a measured length of time, to withdraw a little more so as to expose two, and so on. Another appliance designed by Professor Hitchcock consisted in an arrangement not very unlike that of Muecklow and Spurge's sensitometer. A certain number of cells, each ending in an aperture, were made of wood, forming a sort of honey-comb structure, the apertures varying in area, and the whole arrangement of cells and apertures was placed in front of a sensitive plate. Of course the portion of the plate forming the end of one particular cell would receive an amount of light proportionate to the area of the opening at the other end. Whichever appliance was used the results would, of course, require to be compared with those got by exposing plates of the same sensitiveness at a measured distance from a standard light. For all the smaller instruments dry plates were to be used.

Taken altogether it is probable that no more complete arrangement was ever fitted out for the photographic observation of an eclipse, and after all, as will, long before the time this reaches England, have been well known, to no purpose. All the scientific experts mentioned came several thousand miles to this country and worked hard for a month in fitting up their elaborate appliances, and then, all through a cloudy afternoon nothing could be done, or next to nothing. No observation whatever could be made during totality, and only a very few imperfect ones before and afterwards.

In spite of the fact that the corona was not visible at all, the experience of the total eclipse was an interesting one. The light waned very perceptibly for long before totality began; but the darkening when the moon completely covered the sun's disc was far more sudden than I could have imagined possible. It was all but instantaneous, and the sensation produced was very curious. The darkness was by no means as great as that of a dark night. I could follow the hands of my watch during the whole time of totality, but it was only by close observation. Then, when totality was over, the bursting into light again was as sudden as the darkening had been before, and there was a feeling as of relief, as if some depressing influence had been removed. In a second or two after the light returned there was a sudden rift in the clouds, and we saw a thin half-circle of light like a bit of silver wire. It was only for a second or two, but the sight was a very beautiful one.

There is nothing to be done now but for the members of the expedition to "pack up" and return to America, bearing their disappointment as well as they can. Bitterly disappointed they all must be except Dr. Holland, who has captured I am afraid to say how many thousand insects, or "bugs," as the Americans all call them. Japan must be a paradise for naturalists; it positively swarms with life.

To-morrow I shall make a photograph of the arrangement of the instrument; it may perhaps be worth sending as far as England.

W. K. BURTON.

P.S. (written on the 22nd August).—The results of the observations have, after all, not been so completely *nil* as I at first imagined. No coronal observations were made, but by the great lens several phases of the eclipse were photographed of such a nature as to enable precise measurements of the angular distance of the centres of the earth and the moon for precise times to be made, a thing which, it seems, is desirable. Moreover, Mrs. Hitchcock obtained two very interesting photographs of the earth during the eclipse. One plate was exposed during the whole time of totality (three minutes), the other for twenty seconds, beginning thirty seconds after the termination of totality. The first photograph shows the landscape merely as a black mass against the sky, the second shows considerable detail. The lens used was one of the rapid landscape type, working at about $\frac{1}{4}$.

THE STANDARD OF DEVELOPER.

[A Communication to the Society of Amateur Photographers of New York.]

Nothing has stood more in the way of the amateur's acquisition of the best method of photographic manipulation than the confused and the confusing, muddled, misleading, and thoroughly unscientific way in which the formulæ for developers have been made up. Whether these are to be found in the boxes of plates sold by the manufacturers, or on the pages of the works nominally intended for the instruction of the beginner, they are almost alike in their useless and senseless intricacy.

I brought the question of the possibility and advisability of our insisting upon a comprehensible and uniform method in the compounding of these formulæ before a previous meeting of this Society, and having been placed on the Committee on Developers have given further attention to the matter.

A favourite plan of some reformers is the substitution of French for American weights and measures, and incidentally or independently, the use of ten per cent. solutions. These plans, one or both, have been pressed upon us as a correction of the difficulty, but they do not meet the case. We do not want a purely scientific manipulation, and the gramme will never be our Moses, nor foreign or unusual terms or scales guide us out of our wilderness. What we need is something for everyday use that the least experienced, equally with the most expert, can understand at a glance, employ with absolute certainty, and remember without difficulty. Talking in centimetres or multiplying by decimals is a useless confusion, and even when thoroughly mastered is only mere addition to the unnecessarily numerous differing tables which already bother the photographic mind. A percentage solution is not only an awkward combination to manage, but is so curiously inaccurate as to be nearly absurd. The percentage that a solid bears to a liquid is as droll as the view of the blind man who said that after much study he had discovered that the colour scarlet was very similar to the blast of a trumpet. A ten-grain solution, which is often mistaken for a ten per cent. one, would be entirely proper, but a percentage of hypo, or any other solid, to water is closely allied with the result of multiplying ten oranges by ten pears. Because there happens to be a fluid ounce as well as a solid ounce, it does not follow that there is a proportional relation between the two. Such a proportion if made should be by weight alone and accurately and not on the old cook's theory that a pint is necessarily a pound.

But what is needed in practical photography is a preparation which can be easily understood and quickly varied, while the proportions can be distinctly borne in the mind. Its constituent parts must be so separated that it can be strengthened or weakened from the point of view of effect on the latent image. The ordinarily accepted proportions of the materials of a pyrogallic developer are two grains of pyro to one ounce of water, combined with about eight grains of sulphite of soda, the latter being merely to keep the plate clear of stains. Both of these substances are perishable and deteriorate rapidly in water. To these are added about twelve grains of crystallised carbonate of soda or half the amount of potash for a working developer. Pyro has been used undissolved, but it was found that the same thing had to be done with the sulphite or that also would lose its power. The sulphite and the pyro go well together, but need a preservative. Amateurs are apt to keep their developers too long, and the best of preservatives lose their effects after a time. Nothing else is absolutely

needed in a developer except occasionally bromide as a restrainer, and this is to be added only by drops. Of the principal ingredients, however, the proportions have often to be greatly changed, and opinions differ widely as to the nature of this change. For instantaneous pictures some persons double the amount of pyro from the standard formula, while others reduce it, and for under exposures one man wants a strong and another a weak developer.

Now my suggestion is that we should determine on a certain formula of a fixed strength according to fluid drachms. Say we accept two grains of pyro to eight grains of sulphite in each drachm of the pyro solution, with enough sulphurous or other acid to preserve it. Then for the accelerator let us determine on, say, six grains of potash or twelve of soda crystals to the drachm. We can then mix our developer intelligently without the study of French grammes or the complication of decimals. Say we need a normal compound, we pour out a certain number of drachms from each bottle and fill up to an equal number of ounces of water in our graduate, and we know exactly how many grains of each constituent we have. If we desire an increase of either we can get it exactly by half drachms or less. Thus the quantity of water and proportion of ingredients would be constant, or, in other words, the ingredients would be compounded by drachms containing a fixed number of grains. Then if one manufacturer or manipulator is of opinion that his plates or exposures need more pyro, he can simply use, or direct to be used, an additional amount of drachms of pyro solution; or, if he wants more potash or soda, or a combination of both, he has simply to say how much he wants to the ounce of developer, and those who use it will know what they are about and escape from the present darkness of mystery into the light of knowledge. Suppose, further, that other ingredients are found to be beneficial, for instance, yellow prussiate of potash, the substitution or addition is entirely simple, and the effect can be ascertained readily and certainly. In this way the developer can be varied indefinitely and intelligently, and progress gained where now there is little more than groping.

There is an incidental advantage in the use of a small proportion of fluid in the solutions, that in warm weather the addition of water will bring the developer to the temperature of the others. Of course to make this proposal effectual it will be necessary to get the manufacturers of plates and compounders of developers to consent to adopt it; but this, or some other equally practical plan must be followed if we are ever to settle the much disputed question, one that it is probable amateurs alone are competent to settle: Which is the best developer?

ROBERT B. ROOSEVELT.

SOME NOTES ON THE HISTORY OF THE DISCOVERY OF THE GELATINO-BROMIDE PROCESS.*

WISHING to know more of the steps which had led Dr. Maddox to his admirable researches in connexion with gelatine and silver bromide, I ventured to address him on the subject, and received from him the following note, which, although intended primarily as an appendix to *History of Photography* that I have written (and which will shortly appear in book-form), yet ought, I think, to be laid before the readers of that periodical in which Dr. Maddox's original paper appeared:—

"PORTSWOOD, SOUTHAMPTON, August 19, 1887.

"DEAR SIR,

"In your favour of August 17 you express a wish 'to know more how and why my attention was directed to gelatine and silver bromide?' If you find the answer rather a complex one you must excuse it upon its threefold character.

"Firstly, the cost of the collodion, with the troublesome manufacture of the cotton; secondly, health more or less affected by its constant use when working, as I was, in my camera, a dressing-room, often at a very high temperature in the summer months; and, thirdly, dissatisfaction with the dry methods for the photo-micrographic work upon which I was much engaged.

"The first reason may be dismissed as of little moment when there was an adequate return upon the work done, but not so when there was an absolute loss even in an amateur's point of view. The second reason was a more important one. Being often shut up for hours in the said camera, the temperature at full summer heat, I found the system completely saturated with the vapour of the collodion, so much so, that it could be tasted in the breath on awaking in the night, and sleep was generally much disturbed and unrefreshing, while it was much needed to restore the nervous energy wasted by constant suffering, often very severe in character; moreover, there was an outcry in the household that the collodion vapour unpleasantly pervaded every room in the house. The third reason was that I could find no satisfactory dry or sticky process that did not embrace the first two reasons, and add another of its own

* Concluded from page 683.

in the shape of additional time and trouble in the preparation of the plate.

"These reasons set me experimenting, sometimes on paper, sometimes on glass, with vegetable gummy matters, as lichen, linseed, quince-seed; and with starchy substances as rice, tapioca, sago, &c.; and with waxy material as Japanese vegetable wax. Often I fancied I was just within the doorway when the door closed, and other plans had to be tried. All the literature I could find bordering on the subject was searched, but it rather bewildered than enlightened.

"At last I turned to the animal series and wasted many eggs and some little silver; then I went to the finest isinglass at about twenty shillings the pound weight, and the very first experiment led me to hope I was on the right track, only something had to be altered as I was using iodo-bromide in varying collodion proportions, and the isinglass did not appear to yield a sufficiently even surface in spite of all kinds of filtering; yet confidence was felt that a vein had been struck.

"Search was now made in the house for a packet of Nelson's gelatine; this afforded a better surface, especially as the plates were dried generally on a hot one-inch thick iron slab, and tested at once. Then came the mixture of isinglass and gelatine, but the advantages pointed to gelatine. The little plates were tried under a negative, then on out-of-door objects, but it was impossible to get some laurels depicted in anything more than black and white. I remembered that some one had stated that the bromides were better suited than the iodides for foliage; now came the experiment of diminishing the iodide and increasing the bromide, until it settled into bromide alone.

"Yet I was not satisfied, but experimenting went on so rapidly that often I did not wait to filter the gelatine before mixing the bromide of silver in it. Before this period, that talented experimenter, Mr. Carey Lea, had spoken of the use of *aqua regia*, and my attention was turned to it, fancying that its use would decompose some of the gelatine and furnish the extra silver a chance of forming an organic salt of silver which might possibly improve the image. After working with this, and getting more satisfactory results, various substances were mixed with the gelatine as gum, sugar, glycerine, &c., which gave different tints to the developed negatives, and it was seen that it only required farther experimenting to put gelatine into use; for some of the negatives were fairly plucky and half tones beautifully rendered, but compared with collodion the gelatine was slower, although it stood its ground with some of the dry processes.

"Paper had not been neglected, for amongst the paper trials with the gelatine was one which I thought gave much promise, the tint on development equal to much of the kind at the present day. This was obtained by the addition of a small quantity of arsenite of silver.

"There was no thought of bringing the subject into notice until it had been lifted from the cradle. Soaking the plates before use, for of course I knew the useless salts were left in the gelatine, was noted down for trial; but at this stage, and while in the very heyday of experimenting, there came an urgent appeal from my kind friend Mr. J. Traill Taylor to assist him without delay by an article for THE BRITISH JOURNAL OF PHOTOGRAPHY, of which he was the editor, as he had been taken seriously ill.

"Without a moment's hesitation, and thinking it would give my friend pleasure, the hurriedly written and fragmentary article that appeared in the September JOURNAL of 1871 was forwarded to him, and proofs of sundry negatives were also sent, some of which, almost entirely defaced, my friend Mr. W. B. Bolton and I found three or four years since amongst the glass in the office at No. 2, York-street.

"Another pen had also come to the rescue, and my paper was deferred to the following weekly issue, when Mr. Taylor, with far-sighted judgment, noted the process had a future before it. Health had now fairly broken down, rest was needed, so that very little farther experimenting was done, and as there were other irons in the fire demanding attention, the process was offered to a firm in Southampton from whom I used to get my albumenised paper; but it was found there was no time to continue the necessary experiments to raise the rapidity and enhance its value. This was done at different stages by others, almost two years after I had freely given to the public what had cost me much time and labour.

"The world has been benefited, and I have been honoured with a gold medal and diploma by the Jurors' Committee of the Inventions Exhibition. Do not for one moment suppose I ignore the work of other hands in perfecting the gelatino-bromide process, and thus giving it its world-wide value in all departments of photography, especially that far reaching one of its adaptation to astronomical research. I am only too thankful to feel that I have been merely the stepping-stone upon which others have safely put their feet, though now and then there cropped up the old story of the prophet in his own country; let it pass—this is the Jubilee year. I am grateful to those abroad and at home, who, like yourself, have recognised the original claim of—

"Dear Sir, yours most truly,

"R. L. MADDOX.

"W. JEROME HARRISON, Esq., Birmingham."

There is less need to follow the steps by which Dr. Maddox's work was perfected. In the latter half of 1873, J. Burgess prepared and sold "gelatino-bromide dry plates"—the first ever placed on the market—at half-a-crown per dozen for quarter-plates; and later on

R. Kennett—1874-77—made similar plates, that even now would be called "rapid;" but neither Burgess nor Kennett could make the process a commercial success.

In 1874, the Belgian chemist, J. S. Stas, showed* the effect of heat in producing molecular modifications of silver bromide, and declared that certain of these were "the most sensitive substances to light with which I am acquainted."

When Bennett, in March, 1878, showed that great rapidity could be obtained by "stewing" for several days the gelatine emulsion, he was practically applying the researches of Stas; and the work was completed when Mansfield, in August, 1879, obtained similar results by *boiling* the emulsion for a few minutes.

In view of the great development of the gelatino-bromide process, it is pleasant to think that we have still with us the man who sowed the first seed. Photography proper now rests, we may say, entirely upon the labours of three great Englishmen—Fox Talbot, calotype process, 1841; Scott Archer, collodion process, 1851; Dr. R. L. Maddox, gelatino-bromide, 1871. It is to be hoped that at some not distant date English photographers will acknowledge that it is their duty to commemorate in some lasting form the labours of this illustrious trio. France has set the example by raising statues to Niepce and to Daguerre; but Talbot and Archer—to speak only of those who have passed away—are still unhonoured and almost unknown. Who will lead the way in this matter? We have a Society, a Club, and a Convention, all aspiring to the title of "National." Could they not unite for so worthy an object? Again, I say that it is our duty to publicly honour the men to whom we owe so great a debt, and of whom as our countrymen we ought to be so proud.

W. JEROME HARRISON, F.G.S.

THE FIRST GELATINE EMULSION DRY PLATE.

THE circumstance that the first gelatine emulsion dry plate was made by myself, and, moreover, was developed with alkaline pyrogallol, has just been unearthed and published in these pages by Mr. Jerome Harrison. The question arises why no claim for priority in this matter has hitherto been made in the course of the various discussions upon the history of the subject in photographic journals and societies. The truth is that, having forgotten that the experiment had been published at the time, and as the scientific world is agreed that date of publication and nothing else gives claim to priority, the best plan seemed to be to hold my tongue, rather than to seek for the reputation of Oloffe, the dreamer. This Oloffe once wandered about the banks of the canals of Amsterdam; he was ever ready for a glass of schnapps, and his solitary garment was never washed except by the bounteous showers of heaven; but he was a marvellous man, because nothing remarkable ever happened in Amsterdam without his telling the people afterwards that he had dreamt of it two days before. He was therefore engaged as sailor on board the Dutch ship fitted out to discover the north-west passage to China, that he might aid the explorers by his valuable dreams, which subsequently had a share in founding the city of New York, saith Diedrich Kuickerbocker.

The plate I prepared was coated with a genuine unwashed, uncooked gelatine emulsion, containing bromide and iodide of silver, and was dried upon a levelling stand. Perhaps it may be as well to give the full text of the record, in place of the few lines quoted by my namesake, from my article on *The Philosophy of Dry Plates*, published in THE BRITISH JOURNAL OF PHOTOGRAPHY of January 17, 1868:—

"I dissolved a few grains of gelatine in some water, and diluted the mixture to such an extent that the liquid, when cold, was slightly viscous, like collodion. A little bromide and iodide of cadmium was then dissolved in the gelatinous liquid, after which some nitrate of silver was added in the dark. In fact, I wanted to have a solution which would give a good dry plate by simply coating a sheet of glass with it, and allowing it to dry on the levelling stand—thereby abolishing baths, washings, and the use of collodion in the process. After the nitrate of silver was added the scheme was killed, for the gelatinous character of the liquid was destroyed (possibly by the nitrate of cadmium formed), and the precipitate sank quickly to the bottom of the bottle. Nevertheless, I shook it up well and rapidly covered a plate with a layer of the solution, leaving it then on the levelling stand to dry."

It is evident now that the proportion of gelatine used as above stated was too small to hold the precipitate in suspension. The record continues:—

"The plate dried in a few hours. It had a granular and not very even film, which adhered well to the plate. It was exposed in the camera and then developed by the alkaline method. The picture came out very

* *Annales de Chimie*, Fifth Series, vol. iii., page 289.

rapidly, and was of great intensity; such depth of colour would, in fact, have required twenty or thirty times longer development on a collodionised plate.* I have never seen a picture on a dry plate coated with collodion come out so well, but the rough and uneven film made the picture worthless. Encouraged by the first trial, I added gelatine to the solution in the bottle to bring it to the consistency of collodion again, but had to use many scruples of it before the additions overcame the anti-gelatinising property imparted to the liquid by the added salts. When at last the liquid reassumed the consistency of collodion, and was slightly warmed, several plates were coated and left on the levelling stand, where the film soon began to 'set,' and the plates were then placed on end to dry. Irreproachably even films were obtained. The only fault to be found with them was, that expose or develop them in what way you would, not a trace of a picture would these plates give. The developers would bring out no more trace of a picture upon them than if they had been plates of plain glass."

The explanation of this I now suspect to be that it was a case of wholesale fog. The experiments extended over two days, during which the silver salt, while in the bottle and on the drying plates, was exposed more or less to such bright yellow light as was employed in developing rooms in the old collodion days. Apparently a peculiar sample of gelatine was used, as bought at a neighbouring shop; in those days gelatine specially prepared for photographic purposes did not exist. Mr. Jerome Harrison suggests that the absence of a developable image may have been due to the weakness of the alkaline developers in use in the olden times. Possibly, also, the youthful adventurer forgot to put the pyrogallol in the developer.

Mr. Jerome Harrison also calls attention to the previous work of Mr. W. H. Smith, whose patent may now be examined.

Patent No. 1174, April 20, 1865, is granted to "William Henry Smith, of 12, St. Ann's-gardens, Haverstock Hill, in the County of Middlesex, for the Invention of 'Improvements in Photographing upon Wood, and in the Preparation of Wood, Canvas, Silk, Glass, and other Substances for the Purpose of Receiving and Retaining Impressions.'"

The body of the patent chiefly speaks of photographing on wood, which is first coated with a specified solution, which when dry fills up its pores. The inventor thus describes the preparation of the film upon which he photographs:—

"I next prepare a receptive as above defined, being an aqueous solution, which for sake of reference I call solution No. 1, consisting of twelve parts of gelatine and five parts of honey in 250 parts of water, and I allow this to decompose, and when reduced to a liquid state by natural decomposition I take one ounce of this and dissolve in it a chloride or a bromide (if chloride of cadmium, two grains), one grain of the tincture of iodine and one grain of tartaric, citric, or any other acid of similar qualities. This mixture I call solution No. 2. I then take another ounce of the aqueous solution (before referred to as No. 1), and dissolve in it twelve grains of nitrate of silver, and add the solution to the before-named solution No. 2; this forms the receptive which I call receptive No. 1 for distinction, and this I apply to the wood either with a brush or by floating the wood on a bath of the said receptive No. 1 for five minutes, more or less, and afterwards allowing it to dry."

He then prints upon this surface either under a negative or in the solar camera. In fact it is a "printing-out" process, upon a film formed of an emulsion containing decomposed gelatine, chloride of silver, and a great excess of nitrate of silver.

One paragraph describes how he photographs upon "glass" as well as other substances than wood. He says:—

"I apply a receptive, which I call receptive No. 3, consisting of one ounce of receptive No. 2 as a chloride or bromide (if chloride of cadmium, four grains), three grains of tincture of iodine, and one grain of tartaric, citric, or any other acid of similar qualities until the object is coated. I then sensitise the said coating by immersing it in a nitrate of silver bath containing thirty-five grains of nitrate to the ounce of water. I then withdraw the said object from the bath, and while still wet I coat it with an aqueous solution, which I call solution No. 3 for distinction, composed of ten parts of gelatine and five parts of honey in 300 parts of water, and when dry I print, tone, and fix, as before described for wood."

Thus in photographing upon glass he used no ready-prepared emulsion, but dipped his plates in a nitrate of silver bath, thereby obtaining a sensitive surface with a large excess of nitrate of silver, upon which when dry he printed and toned positive pictures. The process is much like that of printing upon albumenised paper, except that other organic matter than albumen is used. There is nothing in the patent about taking negatives, or applying haloid emulsions to glass.

From what has already been said it appears to be conclusively established that the first negative upon a gelatine emulsion plate was taken in January, 1863; also that there was no excess of nitrate of silver, and that alkaline pyrogallol was used in development.

* This of course meant a collodionised dry plate, as intimated by the context.—W. H. H., November 2, 1887.

The necessity for a close examination of past records to compile accurate history is further illustrated by the circumstance that my record of 1868 was utterly forgotten by its own author until Mr. Jerome Harrison by careful reading brought it to light. I had often regretted that I had not, as I believed, recorded the experiment in print. A somewhat similar illustration of the value of referring always to original documents occurred to me recently while reading up in relation to the history of photography in natural colours. Niépce de St. Victor is habitually quoted in newspapers and books as a leading pioneer in this branch of research; as a matter of fact he was nothing of the kind. He merely adopted Becquerel's discoveries, and by dint of laborious practice turned out rather better pictures than Becquerel, who probably had not the necessary time to give to merely routine work. Truly Niépce enunciated the principle that the colours in such photographs bear relation to the colours the particular chlorides used, would give if ignited in an alcohol flame. If this be so, the credit of discovering the principle belongs to him, and that is all, but the principle is not sufficiently well proven as yet to have been either accepted or denied by the scientific world.

For years Becquerel took no notice of Niépce and his photographs in colour, but finally gave him a little footnote in vol. ii. page 231, of his book *La Lumière ses Causes et ses Effets*, Didot Freres, Paris, 1868. That footnote I now translate as follows.—

"M. Niépce de St. Victor has obtained upon silver plates since 1851 reproductions of coloured engravings and camera images by the first process which I discovered before 1848; but this method of preparation by immersion gives tints less vivid than are obtained when electrical currents have been used in the preparation. The results which he has obtained, and which bear relation to this subject, do not appear to me to differ notably from those which have been published previously and which I had obtained first, so it does not appear to me to be necessary to mention them."

He then gives references to the journals in which Niépce recorded his results, so that his readers might look into the matter for themselves. It must be remembered that Niépce de St. Victor was not the great founder of photography, Nicéphore Niépce, of Chalons-sur-Soane, but his nephew. A third Niépce, Isidore, is also sometimes mentioned in photographic literature; Nicéphore was his father.

Claude François Niépce de St. Victor was originally a lieutenant of dragons, who afterwards entered the Municipal Guard of Paris. He was born in 1805. In 1850, Napoleon III. appointed him Commandant of the Louvre, to give him more leisure to prosecute his photographic researches.

W. H. HARRISON.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 14,684.—"Improvements in or connected with Photography." G. T. HOLLOWAY.—Dated October 28, 1887.

No. 14,725.—"Improvements in Photographic Shutters." G. S. GRIMSTON.—Dated October 29, 1887.

No. 14,809.—"Improvements in Telescopic Fronts and Objectives for Optical Lanterns." Complete specification. A. WRENCH.—Dated October 31, 1887.

PATENTS COMPLETED.

IMPROVEMENTS IN OR RELATING TO THE TREATMENT OF PHOTOGRAPHIC DRY PLATES OR FILMS.

No. 15,727. EDWARD WILLIAM FOXLEE, Acton, Middlesex.—December 1, 1886. This invention relates to the class of flexible film from which the paper or other backing is ultimately stripped. Films of this description vary in construction considerably; in some the stripping of the back is done in a wet state, and in others in a dry state. Some of the films are made with a paper backing, an insoluble gelatine film to receive the image, and a soluble gelatine layer interposed between the two; some makers do not use gelatine at all, but a gelatinous or mucilaginous compound instead. In all cases, however, the film is supported by a backing, generally of paper, which is subsequently stripped off; and to most, if not to all, of these the present invention is applicable. I will, however, describe it as applied to a plate made according to the Boulé (Eastman & Walker) patent, No. 13,596, of 1884, and consisting of the paper backing, the insoluble gelatine film, and the interposed layer of soluble gelatine. I shall use the word "negative" to indicate the insoluble film with the image in it, whether that image happen to be a negative or a positive picture, as it may be either.

An advantage of my invention is that whereas the "negatives" as ordinarily prepared are subject to the attacks of damp and other atmospheric influences, my improved negatives are, when required, coated on both sides with collodion or varnish, which is impervious to atmospheric influences.

In carrying out my invention, I take a plate of glass, or equivalent material, and coat it with plain or normal collodion, such as that employed by photographers but without being iodised. Before the collodion is poured upon the plate the latter is treated in the usual way with wax or Indianrubber, dissolved in one of their solvents or powdered talc (French chalk), or some similar

material, to prevent the permanent adhesion of the collodion. When the collodion has set the plate is immersed in a dish of cold water until the ether and alcohol are washed out. This operation may be accelerated by washing under a tap. When the solvents have been removed from the collodion it is ready for the reception of the negative. This having been fixed and washed is laid faced downward upon the collodion. An indiarubber squeegee is now employed, with some pressure to ensure close contact and expel the superfluous water and air bubbles, but before the squeegee is applied a sheet of indiarubber or paper is laid on the paper and plate in order to prevent abrasion of any exposed portions of the collodion film. Blotting paper is now placed upon the paper backing of the negative, and put under light pressure and allowed to remain for a suitable time, rarely exceeding half an hour. The object of using the blotting paper is to further absorb the moisture and so secure a better contact between the glass and the film. Next the plate, with the adherent negative, is placed without previous drying in warm or hot water. In a short time the paper will be easily removed owing to the solution of the soluble substratum or interposed layer of gelatine, leaving the negative firmly attached to the collodion. The plate is now removed from the water, and a thin sheet or pellicle of gelatine, which has previously been thoroughly softened in water—or a mixture of water and glycerine—is laid upon the negative and pressed into close contact by a squeegee, a sheet of indiarubber being interposed to prevent abrasion. The whole is now allowed to dry; or, instead of applying this sheet in a firm state it may be run on in a liquid state. When the gelatine is dry it is coated with collodion or with a varnish. When this coating is dry the negative is stripped from the glass, when it will bring the collodion film, which was applied to the glass, away with it firmly attached, so that the negative and the gelatine are protected front and back with a film of collodion or with one of collodion and one of varnish.

To facilitate the stripping a sharp knife may be run round the negative, cutting the collodion to prevent tearing.

In some cases where it is not desired to remove the negative at all from the glass plate, as when an inverted or reversed negative is required, it is not necessary to prepare the surface of the glass with talc before running on the collodion; in these cases, when the negative has been attached to the glass and the backing stripped off, it is only necessary to coat the exposed surface with collodion or varnish.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. In the treatment of flexible films after exposure the method or process, consisting essentially in attaching the "negative" to a film of collodion spread upon prepared glass, or equivalent material, and stripping off the temporary backing from the said "negative" or image-bearing film, the whole substantially as specified. 2. In the treatment of flexible films after exposure the method or process, consisting essentially in attaching the "negative" to a film of collodion spread upon prepared glass or equivalent material, stripping off the temporary backing from the said "negative" or image-bearing film, and coating with collodion or varnish, and finally removing from the said glass or other plate the said "negative" or image-bearing film, so that the finished "negative" is enclosed between two coatings impervious to atmospheric influences, the whole substantially as specified. 3. In the treatment of flexible films after exposure, the method or process consisting essentially in attaching the "negative" to a film of collodion spread upon prepared glass or equivalent material, stripping off the temporary backing from the said "negative" or image-bearing film, applying a permanent backing of gelatine or equivalent material, and finally removing from the said glass or other plate the said "negative" or image-bearing film, the whole substantially as specified. 4. A finished "negative" consisting of an image-bearing film, having on each side a coating impervious to atmospheric influences, substantially as specified.

IMPROVEMENTS IN PHOTOGRAPHIC AND OTHER OPTICAL APPARATUS.

No. 15,873. ZACHARY HARRIS KINGDON, Old Charlton, Kent.—December 4, 1886.

MY invention relates to improvements in apparatus, such as cameras and lanterns, for photographic and other purposes, whereby such apparatus is rendered easily collapsible into a convenient form for carriage, and readily erected and adjusted for use.

My invention consists in connecting the parts of the apparatus which are to be closed together when out of use, and separated to a required distance or distances for use by links or levers, or links and levers either alone or in conjunction with flexible or other ties, or the ties may be replaced or assisted by causing certain or all of the links and levers to come in contact with fixed or movable stops or with one another when in certain relative positions, according to the requirements of any particular case.

To obtain rigidity of the structure with its parts in any particular relative positions, such as when opened to a required extent or when closed, I arrange springs so to act on any or all of the links or levers that they in conjunction with the ties or stops constrain the system as required, or I obtain rigidity by causing some or all of the links and levers or their joints to come on or slightly past their dead centres, or I apply spring or other catches or bolts of any form to effect the same end.

In one modification the system of links partakes of the form of the ordinary lazy tongs, whereby any required extension can be obtained by having a sufficient number of links suitably arranged which can be actuated and controlled either directly by hand or through any combination of links, levers, ties, stops, springs, joints, catches, and bolts, as aforesaid.

A final adjustment, when requisite, such, for example, as in the case of focussing the lens, is obtained in the following way:—The frame or setting which carries the lens, or similar part requiring adjustment, is arranged to slide in an outer tube or sheath, the sheath having in it one or more slots or grooves which engage with a stud or studs set in or affixed to the frame or setting. These grooves or slots may be straight, curved, stepped, notched, serrated, or of any other suitable form, and may be in any position and direction; and the studs may be of any suitable form, and may be rigid or otherwise,

as, for example, they, or a part of one or of any number of them, may be attached by a spring which will admit of a slight displacement and will bring them back again to their normal position. The relative positions of the studs and slots may be reversed, the studs being connected to the sheath and the slots or grooves being in the frame or setting.

The position of the frame or setting in the sheath may be indicated by an index and graduations upon any suitable part of either the frame or sheath, or both, or any other portion of the lens mount, or any extension thereof or attachment thereto; or it may be indicated and temporarily maintained by a stud, or catch, or similar appliance, engaging steps, notches, or serrations in the grooves or slots already described, or in any other part or extension of or any attachment to the lens mount. By these means the senses of touch and hearing, together or separately, are employed in focussing and adjusting; but I do not limit myself to these means, as I intend to include all suitable means by which the senses of touch or hearing may be used in obtaining the desired adjustment.

The claims are:—1. In cameras, lanterns, and similar apparatus for photographic and other optical purposes, the connecting of those parts which have to be closed together at one time and separated at another by systems of links and levers, and constraining the same by ties, stops, springs, catches, or bolts, or combinations of any or all of these. 2. The application to cameras, lanterns, &c., of the system of links used in the ordinary lazy tongs for the purpose of rendering them collapsible. 3. The combination of links, levers, ties, stops, and springs herein described and illustrated as applied to collapsible cameras. 4. The application to cameras, lanterns, &c., of jointed stretcher bars having a spring action similar to that of the blade of an ordinary pocket knife in its handle, substantially as herein set forth. 5. The application to cameras, lanterns, &c., of jointed stretcher bars having stops near their joints which prevent them from doubling backwards except a small amount past their dead centres, substantially as herein set forth. 6. All suitable means by which the senses of touch and hearing may be used for focussing and adjusting lenses and other similar parts of photographic apparatus. 7. The arrangements for focussing lenses herein described and illustrated.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
November 7 ...	Notts	Institute, Shakespeare-street.
" 8 ...	Newcastle-on-Tyne & N. Counties	Coll. of Physical Science, Newcastle.
" 8 ...	Manchester Amateur	Masonic Hall, Cooper-st., Manchstr.
" 8 ...	Great Britain	5A, Pall Mall East.
" 8 ...	Derby	Sykes's Restaurant, 33, Victoria-st.
" 8 ...	Bolton Club	The Studio, Chancery-lane, Bolton.
" 9 ...	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 10 ...	Birkenhead	Free Public Library, Hamilton-st.
" 10 ...	Bradford Amateur	Grammar School.
" 10 ...	Halifax Photographic Club	Mechanics' Hall.
" 10 ...	Manchester Photo. Society	35, George-street.
" 10 ...	London and Provincial	Mason's Hall, Basinghall-street.
" 11 ...	Ireland	Royal College of Science, Dublin.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, October 27, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. L. Medland presided.

Some prints from negatives, taken by Mr. A. L. Henderson and Mr. J. J. Brigshaw by the Welsbach light at the previous meeting, were exhibited. One by Mr. Henderson had ninety seconds exposure, with a Dallmeyer's 2nd portrait lens, No. 2 stop. The plate was one which gave twenty-two on the Warnerke scale, a single Welsbach light illuminated the sitter, the face came out well in the negative, and the remainder of the picture was somewhat under exposed.

Mr. F. W. Cox exhibited landscape prints.

The following question from the box was read:—"A negative of a public person was taken, and a promise made by the photographer at the time not to show or publish it during the lifetime of the sitter; the negative was copyrighted and not assigned by the sitter. After the death of the photographer was told that he might do what he liked with it. The death occurred, and the photograph was being published, when the publisher was requested by the executors to desist. Have they the power to stop publishing?"

Messrs. W. E. DEBENHAM and F. A. BRIDGE replied that if no money consideration was taken from the sitter the photographer had the right to publish.

Mr. J. B. B. WELLINGTON asked if anyone had the right to stop the publication of instantaneous photographs taken with detective cameras.

Mr. BRIDGE replied that if anyone were injured thereby, he had the right to stop publication.

Mr. W. M. AYRES believed it to be illegal for a photographer to exhibit the likeness of anyone in a show-case without permission.

Mr. SMITH said that he had taken photographs to be mounted, and was informed that the cost would be six or seven shillings; when a boy called for them the mounter refused to give them up unless he were paid nine shillings and sixpence, which the boy unfortunately paid because he had a half-sovereign. Had the mounter any right to the amount paid?

Mr. DEBENHAM replied that he had no right to more than seven shillings, which should have been tendered to him, and the matter then left for legal decision.

Mr. WELLINGTON stated that the hydroquinone developer gave a greenish black colour with a collodio-bromide plate.

The CHAIRMAN had obtained good black tones with it on lantern slides.

Mr. W. H. HARRISON said that Dr. Eder had recently published that hydroxylamine had come down so in price in Germany as to be practically cheaper in use than pyrogallol. Dr. Eder also said that as a developer it did not discolour in action, and did not stain the shadows of the negative, so must come largely into use.

Mr. WELLINGTON said that caustic potash had to be used with hydroxylamine, so raised blisters in the film.

Mr. HARRISON had forgotten what formula Dr. Eder recommended.

A question in the box asked, in relation to a statement that hydro could be squeezed from silver prints, how that could be done without tearing them.

Mr. AYRES said that they should be laid face downwards on a sheet of glass, and squeezed on the back.

Mr. W. WALLIS, when in haste for prints, had run them singly through an ordinary washing wringer; they were each passed through six or seven times, with ten minutes soaking in fresh water between each rolling. The size of the prints was $7\frac{1}{2} \times 5$.

Another question asked the best form of condenser for the optical lantern.

Mr. BRIDGE recommended a plano-convex lens mounted close to a double convex lens, both four and a half inches in diameter. A smaller size would not always well cover the cushion, and the greater the diameter the greater the loss of light.

Mr. W. M. ASHMAN remarked that Mr. Bridge was an authority, and what he had said as to diameter might be considered to settle the matter.

Mr. AYRES stated that once upon a Daguerreotype plate in his hands the sitter came out as usual, but a red book by his side came out on the plate as red as blood. He had been unable to repeat the experiment, not being able to again hit the exact and unknown conditions.

Mr. JACKSON after toning a collodio-bromide transparency had found local colouration to appear while fixing with cyanide of potassium; gold in various states of fine division seemed to have been thrown down in the film.

The HON. SECRETARY said that on the evening of Friday, the 11th, the proceeds of the meeting in the rooms of the Exhibition of the Photographic Society in Pall Mall would be given to the Photographers' Benevolent Association.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

A COMMITTEE meeting of the above Association was held on the 27th ultimo. The minutes of the previous meeting were read and passed. The election by the Sub-Committee of Messrs. R. H. Bodle, W. Lang, jun., W. J. Lancaster, J. M. Skinner, S. Bell, J. Stuart, J. Davie, H. J. Thorne, and W. Holt, was confirmed.

Photographic Exhibition.—On Friday, November 11, the Gallery at 5A, Pall Mall East will be open from seven to ten p.m. for the benefit of the Benevolent Association. Several well-known gentlemen have promised special selections of slides, which will be shown with the Photographic Society's lantern.

The SECRETARY reported that several members were seeking re-engagements. It was resolved that a general advertisement should be inserted, and it is earnestly desired that employers requiring assistants should communicate with the Secretary at 181, Aldersgate-street, E.C., or 83, Hawksley-road, Stoke Newington, N.

BRADFORD AMATEUR PHOTOGRAPHIC SOCIETY.

THE first monthly meeting of the new session was held at Bridges & Smith's studio on Thursday last.—The President, Mr. D. G. Law, in the chair.

After the minutes of the previous meeting had been read and confirmed, two new members were elected. Afterwards the officers of the previous year were re-elected.

Mr. G. D. SCORAH, the Secretary, introduced Mr. E. J. SMITH, the agent for Brin's Oxygen Company, who gave a demonstration with the lantern, using the new oxygen gas compressed into steel cylinders. This oxygen, being extracted from the air by a mechanical process, is perfectly free from chlorine, and fifty per cent. cheaper than it has been made before, and the bottles are much smaller. The gas is compressed to one thousand pounds to the square inch, and is easily regulated by a simple valve. The light was beautifully white and steady, and after one and a half hour's exhibition only three and a half cubic feet of oxygen and four and a half cubic feet of hydrogen had been used. A bottle of oxygen large enough for one night's lantern entertainment measures nine and a half inches long by three and a half inches thick, and weighs only eight pounds. It is therefore likely to cause a great change in the lantern and enlarging business this winter.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society took place on Thursday, October 20, 1887, at the Rooms, 36, George-street.—Mr. Alan Garnett, Vice-President, in the chair.

The minutes of the September meeting were read and confirmed.

The minutes of a special general meeting held October 7, 1887, were read and passed.

The following gentlemen were admitted members of the Society:—Sir H. E. Roscoe, M.P., Messrs. John Macnamara, W. T. Cunliffe, James M. Kay, and C. H. Wolff.

The HON. SECRETARY (Mr. W. I. Chadwick) read the annual report as follows:—

Your Council have very great pleasure in presenting this annual report of the thirty-second year's proceedings of the Society, as probably not for many years have we had so successful a session. Our number of members have not increased to any considerable extent, nor is it necessary that they should, but it is gratifying to find that the average attendance at our monthly meetings has been greater than in any previous year in the history of the Society. During the past year we have elected twenty-seven new members, against which we have received nine resignations, six have been removed from us by death, and a few others have been struck off our list from other causes. The total number of members at the present time is one hundred and thirty-four against one hundred and thirty-two last year. The average attendance at our usual monthly meetings has been seventy-eight against forty-nine last year.

At the October meeting we had a very interesting paper by Mr. J. Stovold, subject, *Beer as a Restraint* in developing gelatino-bromide plates.

At the November meeting Mr. Sage gave a practical demonstration of the working and developing of Vurgara films; and at the same meeting our President, Mr. Coventry, exhibited his gelatino-bromide emulsion plate coating machine.

In December Mr. Sawyer read a paper on *Pigment Printing*, and gave a practical demonstration of the various processes used by the Autotype Company, and exhibited a large and fine collection of over one hundred specimens of various pigment printing processes.

At our January meeting Mr. Brothers gave an address on *Astronomical Photography*. At the same meeting Dr. Bahh exhibited a number of specimens of Willson paper, and explained its usefulness to the photographer in many ways; Mr. Edwards exhibited a novel roller slide for negative paper which he had made; and Mr. Whitefield showed a most ingenious camera and changing box of his own construction. We also had on that evening an exhibition of about thirty small cameras and tripods suitable for lantern work; these were sent down by their various manufacturers.

The February meeting was occupied with numerous short communications highly interesting to beginners.

In March we had an exhibition of members' work, and at this meeting a selection was made (by ballot) of a subject to form a presentation picture to each member of the Society.

At the April meeting Mr. Abel Heywood, jun., read a paper, subject, *Odds-and-Ends*, in which stereoscopic work and the development of gelatino-bromide plates was well gone into. Mr. Pollitt also read a paper on *Stereoscopic Photography*; and at the same meeting the Hon. Secretary (Mr. W. I. Chadwick) read a paper, subject, *Our Society*.

At our May meeting Mr. George Smith gave a lecture on *Photographic Apparatus and Landscape Photography*; and in September last Mr. J. Traill Taylor delivered a lecture on *Photographic Lenses*.

During the recess from May to September our outdoor meetings have not been perhaps so numerous as in past years, but they have certainly been very successful and well attended, and the Council desire to gratefully acknowledge the services of the Outdoor Meeting Committee and the leaders of those pleasure trips.

During the year our Lantern Section has been hard at work, and the popular evenings have been a thorough success, but, as the Hon. Secretary of that Section will read his report, we will conclude by a reference to the financial state of the Society.

From the Treasurer's balance sheet, which will be handed round, you will see that, notwithstanding the heavy calls made upon our exchequer during the last year, which include 50l. odd for presentation pictures, 16l. odd for lecturers' expenses, and 22l. incurred by the Lantern Section, we have still the substantial balance of 41l. odd in favour of the Society.

Trusting we have discharged our duties to your satisfaction, we respectfully beg to resign our various offices.

The Treasurer's accounts were passed and a balance sheet handed to each member present.

The HON. SECRETARY of the Lantern Section (Mr. W. Watts) read the annual report of that Section:—

In submitting the second annual report to the approval of the members, the Lantern Section Committee have reason to congratulate them upon the general success of the past session. There have been six nights devoted strictly to lantern matters, two popular exhibitions, two ordinary exhibitions, one technical meeting, chiefly discussion, and one night with the lantern microscope. The Committee have experienced some inconvenience since occupying the new quarters, partly through the unsuitability of the room for lantern meetings if well attended, and in having to find a large room for the popular exhibitions elsewhere, and thereby causing an increase in the expenditure. During the last session upwards of two thousand persons have been in attendance at the several meetings, which speaks well for the popularity of the Section. The Committee again regret to have to report that the invitation to form a Society stock of slides has still met with no response. The details of the six meetings are as follows:—

Wednesday, October 27, 1886, Mr. Schofield in the chair.—Mr. Greatorex gave an address of great technical interest, relating his experience with wet plates, tea process, collodio-albumen, collodio-bromide, Cowan, Edwards, Fry, and Véral's chloride plates, Huttine's plates, and gelatino-bromide plates. Upwards of sixty slides were shown by Mr. Greatorex, which were charming results of landscape composition and manipulative skill. The views were accompanied by a very careful paper giving formula and exposure. This was followed by thirty slides contributed by Messrs. R. Atherton, O. E. Taylor, and J. G. Jones, many of which were good examples of contact printing and reducing methods. The lantern was worked by the Hon. Secretary, Mr. W. I. Chadwick.

November 24, Mr. Muth in the chair.—This evening Dr. Sidebotham, of Hyde, demonstrated the application of the kaleidoscope and cycloidrotrope with the lantern, projecting upon the screen some very beautiful effects of colour and design. Upwards of one hundred slides were handed in for exhibition, from which a large number were selected for the popular exhibition in December. Mr. Greatorex assisted at the lantern.

December 22.—This evening was the first popular one of the session. The first portion of the exhibition consisted of sixty slides contributed by Mr. Heywood, taken by him during a tour in the Hardanger Fjord, Norway. The description which accompanied the views was exceedingly instructive and interesting. This was followed by an exhibition of the members' summer's work, and consisted of one hundred and fifty slides by the following members:—Messrs. Robinson, Muth, Farrow, Oram, Edwards, Cheetham, Stovold, Harrison, Smith, and Cooto. Mr. Cheetham, of Hyde, manipulated the lantern.

January 27, 1887, Mr. W. I. Chadwick in the chair.—This was the second popular meeting of the Section. Three hundred and fifty views out of five hundred contributed were shown on the screen and briefly described by Mr. W. I. Chadwick, and were contributed as follows:—Messrs. Gale, Brooks, Wilson, Fincham, Valentine, and York; also by the following members of the Society:—Messrs. Greatorex, Cooto, Burt, Muth, Whittaker, and Stovold. An important feature of this exhibition was the use of gas in bottles in comparison with gas in bags, the result in the first case being very good as concerned the light but wasteful as regards the cost, and not thoroughly satisfactory. Mr. Jones worked the lantern.

February 23.—Mr. Schofield presided at this meeting, which was announced to be devoted to the discussion of the important question to lanternists, *Bags versus Bottles*. The discussion, which was a lengthy one, emanated from the results gained at the previous exhibition test, was taken part in by the following members:—Messrs. Chadwick, Jones, Williams, Mellor, Furnival, and Okel, the result being that the matter was not thoroughly thrashed out. A choice collection of slides by Mr. G. Smith, and a number of coloured slides by Messrs. Wilkinson, were shown in conclusion.

March 23.—This evening was devoted to the lantern microscope, Mr. Schofield in the chair. Mr. W. Leach gave an exceedingly interesting demonstration of the application of the microscope with the lantern and related many interesting details of his twenty years' experience with the combination of these instruments. Mr. Greatorex manipulated the lantern on this occasion.

In retiring from their term of office, the Committee cordially thank the members for their kind assistance, and hope that the Lantern Section will still continue to be an attractive and interesting source of recreation to the members of the Society.

Mr. WATTS proposed an addition to the rules, of which he had given due notice; this was seconded, and a discussion took place, the result being that the motion was withdrawn.

The election of officers for the ensuing year took place resulting as follows:—

President: Sir H. E. Roscoe, M.P.—*Vice-Presidents*: Canon Beechey, Messrs. A. Coventry, Abel Heywood, jun., Alan Garnett, and John S. Pollitt.—*Council*: Messrs. T. Chilton, J. R. Grentorex, J. G. Jones, S. D. McKellen, Otto Muth, S. Okel, John Schofield, H. Smith, W. Watts, and Leader E. Williams.—*Treasurer*: Mr. W. G. Cote.—*Librarian*: Mr. John Schofield.—*Hon. Secretary*: Mr. W. I. Chadwick.

During the time occupied in casting up the votes Mr. Alan Garnett exhibited a number of very excellent prints from stripping film negatives and also a number of film negatives. These were objects of great interest and considered quite equal to negatives upon glass plates.

Mr. H. Smith had similar exhibits.

Mr. W. Blakeley showed some very nice stereoscopic views.

Several other exhibits of members' work brought the meeting to a close at a late hour.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting of the above Society was held in the Technical Schools, Bridge-street, on the 27th ultimo.—The Vice-President (Mr. W. J. Harrison, F.G.S.) in the chair. There was a large attendance.

The minutes of the last meeting were read and confirmed.

Messrs. John Collier, D. Gwynne, C. J. Husband, James Harrison, G. C. Lloyd, J. H. Maekenzie, A. Pope, W. Walkington, and H. F. Woodward, were elected members of the Council.

THE HON. SECRETARY read a letter from the Camera Club asking for a member of this Society to join the Conference Committee for next year. This was referred to the Council, to nominate and elect a member for the same.

A letter was read from Mr. A. Constantine, offering five albums for presentation to the hospitals.

MR. PLACE, who was to read a paper on *Lantern and Slides*, kindly postponed the same for another evening, as the competition for the lantern slides shown at the late Exhibition had to be decided, and, in lieu of his paper, passed the different competing slides through the lantern. The judging was decided by the Lantern Committee, and the prize was awarded to Mr. W. Tylar (subject to the production of the original negative) for his picture *Whoa!* a team of horses and waggon in the hayfield. A picture of three geese, entitled *The Three Judges*, by Mr. E. H. Jaques, and *Fishing Boat*, by Mr. W. D. Welford, gaining honorary mention as second and third respectively.

The Judges had some difficulty in making the award, inasmuch as the good qualities of many of the pictures ran very close. Probably from a photographic view Mr. Jaques's picture was most perfect, but the composition and general effect placed Mr. Tylar's picture in the front.

After the competition Mr. Place showed on the screen lantern pictures of the prize and commended pictures at the late Exhibition, which Mr. Welford had not only suggested, but had taken himself, and kindly presented to add to the Society's stock of slides.

The meeting terminated with the announcement of the paper for November 10 next—*Collotype or Practical Lithography*, by Mr. E. C. Middleton.

HALIFAX PHOTOGRAPHIC CLUB.

THE annual meeting of the above Club was held on Friday evening last, October 28, in the Mechanics' Hall.—Mr. B. Rowley in the chair.

On the minutes being read, and the thanks of the Club unanimously given to the retiring officers, the election of officers for the ensuing session was proceeded with as follows:—*President*: Mr. B. Rowley.—*Vice-Presidents*: Messrs. T. Illingworth and J. E. Smith.—*Treasurer*: G. H. Jackson.—*Hon. Secretary*: W. Clement Williams.

The Hon. Secretary received instructions to conclude all arrangements for lectures and demonstrations, in order that interesting matter should be available for each meeting of the session.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting was held on Thursday, October 27.—The President, Mr. George H. Rutter, in the chair.

The minutes of the last meeting were read and confirmed.

The following were unanimously elected members of the Association:—Messrs. J. L. Mackrell, C. Oylor, and Joseph Walker.

THE HON. SECRETARY acknowledged with thanks the receipt from Messrs. Hiffa & Son of a copy of Welford & Sturmy's *Photographers' Indispensable Handbook* for the library. He also read letters from the editors of the *Amateur Photographer* and *Camera Magazine*, placing their medals at the disposal of the Council for the forthcoming photographic exhibition.

THE SECRETARY of the Exhibition Sub-Committee (Mr. Mayne) read a report giving particulars of the proposed exhibition and *soirée*, from which it appeared that they proposed to hold the exhibition in March next for two weeks, commencing Monday, the 5th, in the Fountain Room of the Art Gallery, which had been granted for the purpose; and also that about twenty medals, two of which were gold, seven silver, and the remainder bronze, would be offered for competition in various classes.

MR. RUTTER moved, and Mr. J. H. DAY seconded, "That the report of the Sub-Committee be accepted," which was carried unanimously; also a vote of thanks to the editors of the *Camera* and *Amateur Photographer*, for their generous offer, which was accepted; and particulars of the medals and the conditions on which they will be awarded will be added to the prospectus of classes and medals which will shortly be published for circulation.

A new Sub-Committee was appointed to carry out the details of the exhibition, consisting of Messrs. Atkins, Beer, Crowe, Day, Dearly, Gibbs, Lange, Lupton, Mayne, Riley, Rutter, Tomkinson, and the Hon. Treasurer and Secretary *ex officio*.

THE PRESIDENT announced that the Council had chosen Messrs. Boothroyd, Boodle, and Thompson, to act as Judges in the annual competition, for which that was the last day for entry of prints.

MR. H. N. ATKINS gave a hint in regard to film photography showing a

means of utilising ordinary double dark slides for films. He advised taking a piece of stout card-board about one-eighth of an inch thick, the exact width and double the length of the glass plate; by partly dividing this at half its length it will fold over; a length of film is then taken from a roll an inch longer than the card-board, this is folded tightly over the doubled card-board and half an inch turned in at each end, which makes a compact parcel to fit the slide exactly. By placing half a dozen drawing pins into a slit cut at one end in the thickness of the card-board, the points projecting inwards, when closed they will hold the paper quite firmly.

MR. G. E. THOMPSON then read a paper, which has already been printed in the journals, on *Picturesque Italy*, illustrated by about one hundred and sixty lantern slides projected by the limelight lantern, which was ably manipulated by Mr. Phillips. These slides, consisting of scenes from Genoa, Naples, Pompeii, Capri, Amalfi, and other places, were many of them of great beauty, and were received with much enthusiasm, bringing vividly before the stay-at-home members of the Association many of the beauties of "Picturesque Italy." Mr. Thompson's description of the scenes visited was followed with great interest, and a unanimous vote of thanks closed the proceedings.

Correspondence.

THE PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—The Photographic Society of Great Britain have very kindly placed their Exhibition at the disposal of the Photographers' Benevolent Association on Friday, November 11, from seven to ten p.m. A charge of sixpence for admission will be made for the benefit of the funds. I should feel obliged if you will kindly find space for this announcement, as it will doubtless aid to ensure success.—I am, yours, &c.,

181, Aldersgate-street, E.C., Nov. 31, 1887. H. HARLAND, Secretary.

To the EDITORS.

GENTLEMEN,—Oh! why did the *Builder* not stick to its bricks and mortar, and leave us poor photographic minions to dream on in blissful ignorance of the manifold faults laid so cruelly bare in its Photographic Exhibition critique?

It makes one shudder at the unspanable gulf it discloses between photography and art. Among many other as able examples it proceeds to state: "Photography merely copies; the artist—even the most nominally realistic artist—does far more than copy, and nowhere can this distinction be more clearly seen or more strongly felt than in studying the efforts of photographers to produce pictures of human life. *Home, Sweet Home* (41), an interior by Mr. Lyddell Sawyer, is another, we might almost say flagrant, example; the little bunched-up figure of the child held up in its father's arms is capital, and would be worth the attention of a painter, but the figures and physiognomies of the parents reduce the whole thing to sheer vulgarity."

Here is evidenced a subtlety of keen art criticism which we, alas! must despair of ever attaining, and I sink abashed before this powerful discernment.

The only little consolation I find is that my ignorant lady acquaintances have, without a single dissentient voice, voted me a fraud for trying to palm off, in the picture in question, a palpable "bunch o' clouts" as a real baby! But now let them alter their blessed babies, for had not the *Builder* spoken? *Dare*, dare I state that my sister and I proudly posed in that picture as the fond parents, whose "figures and physiognomies reduce the whole thing to sheer vulgarity?" In mad jealousy I have rent my too-gifted offspring in shreds, cast its fluttering remains to the relentless ragman, and now my sister and I occupy every spare moment hanging out on the clothes-line, hoping thereby to attain some of that enviable baby's pure æsthetic outlines. So far, alas! the results are only discouraging, but "hope springs eternal in the human breast." I am, yours, &c.,

LYD. SAWYER.

6, Novaine-row, Newcastle-on-Tyne.

TRAFALGAR-SQUARE MEETINGS.

To the EDITORS.

GENTLEMEN,—I beg to add my protest against the permission by the authorities of the holding of "Agitation Meetings" in Trafalgar-square, on the ground that the weekly takings for admission to the Exhibition of the Photographic Society of Great Britain are very seriously affected thereby. As a peaceful citizen, moreover, I have on two occasions been denied the right of crossing the Square, when pressed by time appointments on matters of business with gentlemen at the Gallery, 5a, Pall Mall East. I trust you will consider this letter sufficiently "photographic" to give it a place.—I am, yours, &c., S. G. BUCHANAN WOLLASTON.

Lennie, Clislehurst, Kent, November 1, 1887.

"CAROLLING."

To the EDITORS.

GENTLEMEN,—The curiosities of criticism are a mystery at which I often wondered, and usually enjoy in silence when my own works are concerned, but there is one remark in the notice of the Exhibition, reprinted by you from the *Builder*, which, as it pertains to a matter not

of taste but of fact, I should like to correct. The writer praises the landscape part of my picture—*Carolling*—which, he says, "has really the softness and distance of a water-colour painting," and, he adds, "but we imagine this has been touched upon, and is not pure photographic work." To this unwarranted statement I have to say most emphatically that this picture is absolutely free from any touching, or dodging, or falsifying, even to the innocent extent of the removal of a freckle, being in this respect, I fancy, purer than nine-tenths of the pictures exhibited, as you may yourself see in the unmounted print I have sent for your inspection.

Now I am on the subject, I may say that I am aware there has been a good deal of controversy about the truth of this picture. I know, also, that one good-natured critic neglected his legitimate business, both on the press day and at the *soirée*, that he might devote himself to the genial task ("picketing" I think it is called in the region from whence he comes) of pointing out to the members of the outside press and others that the figures are too tall, and their shadow too long, and other unpardonable artistic sins. But how can I help his ignorance? I am charitable to call it ignorance. My only reply is, that the figures were carefully sketched on the site they occupy, so that their proportions should be absolutely exact, and that the shadow is the work of nature. As Dryden tells us—

"Art may err, but nature cannot miss."

It is a smaller argument, I suppose, to say that I was not likely to make a mistake of this simple kind after thirty years' practice.

The picture is confessedly a combination print from several negatives, but the negatives were all taken at the same hour of the day, at the same time of year, and under similar circumstances. Nothing was altered but the focus of the lens to suit the different planes. I knew that the shadow to a superficial mind not accustomed to observing nature would look too long, but that effect is caused by the slope of the ground, and I could not alter the level of the land to aid the understanding of a superficial mind.

Now I may as well confess (for I have no secrets in my practice) a thing which would have rejoiced the heart of the kindly critic if he had found it out for himself, but which does not detract from the truth of the picture. Part of the picture was photographed as long ago as 1881. There was a want of balance which did not please me, so I preferred to wait for the two trees to the left, which had just been planted, to grow. I waited six years, and think the point they make was worth the patience, and a photographer who is not endowed with that quality must never expect to do good work.

Supposing—which is a large order—that the *real* object of our good friend was scientific accuracy, what would be the use of it in a picture intended to give delight to the eye only? Let us have truth by all means, or as near to it as we can go; but it is not a paradox to say that literal fact is often opposed to artistic truth. Painters seldom bother themselves about the trivialities of scientific fact; they never stoop to consider whether the wings of their angels would support them in the air, and I remember that Turner was much applauded for introducing two suns in one of his pictures, because the pictorial effect required some such device! And I may conclude by adding that, judging from the falsification of the report of a late exhibition, the critic I allude to is scarcely a trustworthy authority on a question of truth.—I am, yours, &c.,

Tunbridge Wells, October 29, 1887.

H. P. ROBINSON.

PHOTOGRAPHIC ACTION IN THE DARK.

To the EDITORS.

GENTLEMEN,—In your *JOURNAL* of October 7, page 628, Mr. D. Winstanley reports an experiment substantially the same as one reported by Charles Zenger a year or two ago, and arrives at the same conclusion, viz., that a piece of common white paper exposed to sunlight absorbs certain energy that is capable of producing photographic action when the paper is removed to a dark room.

Now, it is so easy to prove this to be untrue, that I am surprised to see such an assertion made by men who make a pretence to being scientific. The fact is, that the alleged "photographic" action will in most cases take place just as readily if the paper is not exposed to light at all, and is really nothing but a chemical discolouration, which a very slight cause is sufficient to bring about under certain conditions familiar to most photographers who have handled much silvered albumen paper in warm, moist weather.

The experiment with paper exposed under a negative, only proves that the prolonged action of intense sunlight produces some slight chemical change in the substance of the paper, which modifies its power to affect the sensitive paper when brought in contact with it. If the action were truly photographic, contact would not be necessary to secure an impression, and it would be unsafe to take a piece of white paper from under the skylight into a dark room, where plates are being handled that are a thousand times more sensitive to true photographic action than silvered albumen paper.

I have obtained very strong impressions of newspaper type matter on polished glass, by wrapping the glass in a newspaper, and allowing it to stand a few weeks in a room occupied every day by several persons. These impressions appeared to consist of a filmy deposit from the air, which is prevented from reaching the glass wherever it is covered by the printed characters. I would quite as soon think of calling these im-

pressions "photographs" as the discolourations produced on silvered albumen paper under somewhat similar conditions.—I am, yours, &c.,
Philadelphia, October 18, 1887.
FRÉD. E. IYER.

AMMONIA.

To the EDITORS.

GENTLEMEN,—The correspondence of Professor Donkin concerning the behaviour of ammonia on further solution in water has led me to look into the matter. The result is rather of physical than photographic interest; but as it seems to point a moral, I submit the following calculations:—

On page 331 of the last *BRITISH JOURNAL PHOTOGRAPHIC ALMANAC* is given a table of percentages of *real* ammonia in solutions of various specific gravities: I propose with its aid to calculate the s.g. of a "ten per cent." solution of ammonia at 0.8844, on the hypothesis that no shrinkage takes place, and then to compare the result with the table, in order to see if this hypothesis be correct.

The table gives thirty-six per cent. *real* ammonia in the solution of s.g. 0.8844, therefore the weight of 100 volumes is 88.44. Of this the weight of ammonia is 31.84, and the weight of water is 56.60.

To make our ten per cent. solution, take ten volumes of the above (containing weight 3.184 of *real* ammonia) and weighing 8.844, and ninety volumes of water, weighing 90.000. Total weight of 100 volumes = 98.844. Therefore the s.g. (defined as the weight of a unit of volume) = 0.9884.

Again, we have 98.844 parts by weight contain 3.184 of *real* ammonia; what is that per cent.? Answer: $98.844 : 100 = 3.184 : 3.221$, or ammonia of a.g. .9884 contains 3.221 per cent. of *real* ammonia, if no shrinkage take place.

Turning now to the table, and interpolating for the decimal, we find the *actual* s.g. of ammonia solution containing 3.221 per cent. of *real* ammonia is not .9884 but .9861—that is, an *expansion* has taken place; in other words, if we mix one fluid ounce of ammonia s.g. .8844 with nine ounces of water, the resulting bulk will be a trifle *over* ten fluid ounces.

One correction remains to be made:—The s.g. of water at 14° C. is not 1 but 0.999285; this reduces the calculated s.g. of the solution to .9877, still in excess of the *actual*, as found from the table.

The result is what might have been expected; if *solution* is accompanied by shrinkage, *dilution* will be accompanied by expansion.

Thus it appears to me that while Professor Donkin rightly contended that no shrinkage occurred in the experiment described by the Editor, and rightly interpreted the phenomenon, he overlooked an accompanying phenomenon which really supports the Editor's (and my) contention, that shrinkage occurs in many cases when solids (or liquids) are dissolved in water.—I am, yours, &c.,

R. C. PHILLIPS.

4, Camp-street, Lower Broughton, Manchester, Nov. 1, 1887.

THE LATE I. H. JENNINGS.—AN APPEAL.

To the EDITORS.

GENTLEMEN,—In an obscure cottage in the little village of Bulcote, near Nottingham, has just passed away at the early age of thirty-seven, a gentleman who, amongst his other pursuits, had made photo-micrography one of his serious studies. The benefit of his knowledge he gave to amateurs in a little work entitled, *How to Photograph Microscopic Objects*, by I. H. Jennings, and published by Messrs. Carter & Piper, and which he begged to dedicate to myself as a token of a kindred aim and valued friendship.

This gentleman, Mr. I. H. Jennings, was finishing the term of thirteen years as one of the assistant masters at the High School of Nottingham, when a new head-master was appointed and Mr. Jennings was informed his services were no longer required. Sadly depressed, misfortune followed him—he lost his little boy, his wife had a serious illness, and he had to remove to a miserable cottage. At my suggestion, and much against his wish, a public appeal was made for him, but with very feeble response, the small sum ending in the miserable dole of twelve shillings a-week to pay rent, taxes, food, coals, and clothing for himself, wife, and little baby. This was a pitiable condition and deep distress for one in sad ill-health, endowed with high intellectual powers, and most capable of writing upon any of the topics he had studied, especially on photography, natural history, and country pursuits of shooting, angling, and gardening. A good microscopist and geologist, he had formerly turned his attention to rock sections; but now the dark cloud of semi-starvation canopied his home, and it was only by the timely help of three or four correspondents, whom he had never seen, that this impending cloud was prevented from earlier breaking up the home.

Mr. Jennings was a terse writer, and his pen has furnished valuable contributions at various times to some of the journals, at home and abroad. He has left a widow, herself sadly broken down by want, and one infant. It has greatly pained me to give this brief notice of one for many years my valued correspondent. The case is well known to my friend Mr. A. Pringle, and I trust this may, with your permission, be the means of calling attention to the pressing needs of the widow and fatherless child.—I am, yours, &c.,
October 31, 1887.

R. L. MADDOX.

MERCHANDISE MARKS ACT, 1887.

To the EDITORS.

GENTLEMEN,—So far as I am aware there have not yet been any prosecutions under this Act. But some of its provisions are so far-reaching that

its possible effects upon one branch at least of photographic business may be well deserving of a little consideration. I will first give a few extracts.

Clause 2.—"Every person who . . . applies any false trade descriptions to goods, &c., shall be guilty of an offence against this Act. (2.) Every person who sells or has in his possession for sale, or any purpose of trade, or manufacture, any goods to which any false trade description is applied shall be guilty." &c.

Clause 3.—(1.) The expression "trade description" means any description, statement, or other indication direct or indirect. "(b) As to any place or country in which any goods were made or produced, or (c) as to any goods being the subject of an existing patent, privilege, or copyright." The expression "goods" means anything which is the subject of trade, manufacture, or merchandise. (2.) "The provisions of this Act respecting the application of a false trade description to goods shall extend to the application to goods of any such figures, words, or marks, or arrangements or combinations thereof . . . as are reasonably calculated to lead persons to believe that the goods are the manufacture or merchandise of some person other than the person whose manufacture or merchandise they really are."

Clause 5.—"A person shall be deemed to apply a trade mark or trade description to goods who (a) applies it to the goods themselves, or . . ."

There are very many other clauses deserving attention, but for my present purpose the above will suffice. On this occasion I confine my remarks to the possible bearing of this Act upon the photographic lens trade. I conceive that any person who imports and sells or exposes for sale any photographic lens manufactured abroad, and issued by the manufacturer without name or address, and who subsequently engraves or in any manner affixes the name of any person or Company in this country to a foreign lens without intimating that the lens is of foreign manufacture, is guilty of an offence under this Act.

In Clause 3, Sub-section (b), it is quite clear that to mark any lens "Patent" when no patent, privilege, or copyright is still existing, is an offence under this Act.

I may possibly have some further remarks to submit next week.—I am, yours, &c.,
C. W.
November 1, 1887.

Exchange Column.

- Four Victoria lenses and camera offered for whole-plate camera and double backs.—Address, C. BANTARD, Yoxford, Suffolk.
- Bigelow's *Album of Lighting and Posing*, with Key, for 12x10 or 10x8 view lens.—Address, W. W. EYERS, Walth, Rotherham.
- Wanted, good half-plate printing frames in exchange for Seavey's profile stile and fence.—Address, COLES, Photographer, Walford.
- I will exchange whole-plate portrait lens for modern camera with latest improvements.—Address, W. W., 156, Noel-street, Nottingham.
- Will exchange 12x10 portrait lens, equal to new (Lerobon), for rectilinear lens, 12x10, good.—Address, GUTHRIE, Photographer, Dundee.
- I will exchange a twelve-inch roller for background, and Ronch's 12x10 dark tent for chair.—Address, C. EASTMENT & SON, Photographers, Ebbw Vale, Monmouthshire.
- Will exchange Rhenkoff coil and batteries, also microscope and objects, for good magic lantern with four-inch condensers.—Address, THOMAS J. McCANN, 24, Kirkpatrick-street, Bridgeton, Glasgow.
- I will exchange a pair of oxyælium jets and sheet four yards square, also block of lanterns for advertising, for half-plate camera and lens or a good camera with more than one dark slide.—Address, C. CHAMBERS, 18, Tipping-street, Stafford.

Answers to Correspondents.

- PHOTOGRAPHS REGISTERED:—
H. Wragg, Wigan.—Four photographs of late W. Pickard, Esq., J.P., of Wigan.
T. P. Graham, Bedford.—Photograph, "Where's your License, Major?"
- W. C.—The matter will receive consideration.
- T. B.—Any gasfitter in your neighbourhood will procure the burner for you.
- REV. B. P.—Mr. Redmond Barrett is one of our best and most intelligent retouchers.
- J. E. M.—The *Chemical News* is published in Boy-court, Ludgate-hill, London, E.C.
- WILL.—1. Yes.—2. We are uncertain; but you might try Schanischief.—3. We use the Pamphengos lamp.
- W. PHILLIPS.—Try a different sample of gelatine. The gelatine is, no doubt, the primary cause of the trouble.
- SILVER IODIDE.—The colour of the print appears to be all right. What is the fault you find with it? Does it not tone properly?
- H. W. B.—1. It is usual to consider the effective to be the actual aperture.—2. Yes, the stop should be situated proportionate to the focus of the lenses.
- S. N. (Lansanne).—1 and 2. Yes, if the solutions be saturated at the temperature stated; but you must bear in mind that temperature is an important factor in the case. A solution that may be saturated at one temperature may be very far from it at another. The best plan is to prepare the solution of a definite strength.
- A. H. HALL.—1. The amount of emulsion to be put upon a plate depends very much upon how it is prepared. If it be rich in silver bromide a much smaller quantity will suffice than if it contains a large amount of gelatine in proportion to the silver. Better coat a few plates with different quantities of that you propose to use, and when they are dry compare them for opacity with good commercial plates.—2. Citric acid is preferable.

R. RESTALL.—From your description we surmise that your collotype plates have been over exposed as they take too much ink. Try the effect of less exposure.

J. B.—Marine glue or shellac dissolved in methylated alcohol will do quite well for cementing in the piece of glass; but, unless the bath is a large and expensive one, it may probably be cheaper in the long run to get a new one. Mended vessels which are to contain silver solutions are seldom satisfactory.

LIGHT writes: "Will you tell me if I can make use of pyrotechnic powders, such as nitre, sulphur, and orpiment, for the production of photographs without being sued for an infringement of any patent? or, if so, what light can I use?"—There is no patent which will prevent our correspondent from employing pyrotechnic compounds for taking photographs.

AN ANXIOUS INQUIRER.—Assuming that your studio is lighted only from one side, more shadow and greater rotundity can be obtained by drawing down the roof blinds so as to cover up about half the glass, and at the same time taking away the tissue paper at the side. If, however, the studio has glass on both sides, cover up one side and proceed as just recommended.

COL. HERBERT.—We do not know of any such photographically illustrated work on the Norfolk Broads as that of which you speak. The only work of this nature of which we are aware is one entitled *Three Weeks in Norfolk*, by J. F. Mostyn Clarke. It, we know, contains many attractive illustrations, and is, without doubt, the work to which reference is made. It may be obtained from Wyman & Sons, London. Mr. Emerson's work is entitled *Pictures from Life in Field and Fen*.

3. ST. JAMES'S-TERRACE, NOTTINGHAM.—We cannot decipher your signature, although aided by all the powers at our command. Certainly you were answered, but we answer again. An article on photo-lithography appears in the last edition of *Hardwich's Manual* (Messrs. Churchill). Probably you will find something in the forthcoming ALMANAC that will supplement what is written in the manual referred to. Kindly write your signature plainly; and this applies to many others of our friends.

H. B. A.—1. If the dish be mended it will do quite well for an alumn bath. As the size is so small it will probably be cheaper in the end to get a new one.—2. It will depend upon the value an amateur puts on his time and the price at which he can purchase the frames as to whether it will be cheaper for him "to frame his own pictures or not."—3. Forms for patents can be procured from any Post Office, for which no charge is made. The cost of a Provisional Specification is 1*l.*, and for a complete one 3*l.*; total, 4*l.* for four years.

J. W. L. asks: "What is the cause of the markings on the portion of a negative which I send you? Lately I find it impossible to intensify the plates with bichloride of mercury without staining, and the stains show more in the prints than in the negative. I use one part of a saturated solution of the bichloride to four parts water, and half a drachm of ammonia to a pint of water. The markings extend nearly over the whole of the plate."—The cause of the stains is that the plates have been imperfectly washed between the operations. The make of the plate has nothing to do with it. More complete washing will entirely obviate the evil.

S. M. writes: "1. Would you recommend me to add gold to a toning bath when it has got very weak or make fresh? If it should be added, how long before use? I mean an acetate bath.—2. What kind of lens is best for enlarging up to 15x12, to make the best of work?—3. For *carte* work in the studio would you use a lens advertised as a card lens or a cabinet?"—In reply: 1. Fresh chloride of gold may be added, but the addition should be made twenty-four hours before the bath has to be used. A little fresh acetate will be required from time to time.—2. A lens of the "rapid" type or a portrait lens is as good as any.—3. Either will do.

W. D. writes: "I have unfortunately broken one of my whole-plate negatives of a group of cows which I prize very much. I find the glass support is broken but the film remains uninjured (at least as far as I can ascertain). Would you kindly give me the necessary instructions for floating off the film on to another sheet of glass?"—Our correspondent's best plan, if the film itself is not injured, will be to alum the negative, to prevent expansion, and then immerse it in a very dilute solution of fluoric acid—about one drachm of acid in ten ounces of water. This will detach the film, which can then be floated on to a fresh piece of glass. It will be well to give the new glass a preliminary coating of gelatine. The deposit is no doubt oxalate of lime unless, indeed, the solution was put into a dirty bottle.

THE FORTHCOMING ALMANAC.—Those friends who purpose sending contributions to the ALMANAC will oblige by doing so under such circumstances as to reach the Editor not later than Tuesday morning next.—THE EDITOR, 2, York-street, Covent Garden, London, W.C.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, November 9, 1887, will be *Instantaneous Snappers*.

UNDER the designation "R. W. Thomas & Co., Limited," it is proposed to convert the long favourably known firm of R. W. Thomas into a limited company. The capital is 20,000*l.*, in 20,000 shares of 1*l.* each. Among the Directors are the names of J. L. Lyell, Frederick York, Herbert R. Barrand, H. Manfield, Wm. F. Donkin, A. E. Brooke-Hunt. The General Manager is Mr. J. T. Sandell, Mr. Andrew Pringle being Consulting Experimentalist.

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VEILED SHADOWS.

We have arrived at a season of the year when, if we may judge from murmurings that have come within our own purview, the dry plate manufacturer must be receiving such frequent complaints of "foggy plates" as to cause considerable disquietude, to use the mildest term. The time is gone by when the silver bath was credited with all the fogs that collodion negatives were heir to; the careless, the ignorant, the incompetent, could once lay all their sins on the vagaries of their baths, but now there is no middle way betwixt the faults in the plate and faults in the user. Yet, as a matter of fact, so far as the manufacture of plates is concerned, the makers at the present time enjoy excellent weather for their purpose, and there is every reason for their plates to be good instead of bad. There is no fear of intense heat interfering with emulsion, and the trials brought about by extreme hygrometric conditions of the atmosphere have scarcely yet made themselves felt, as they shortly will do.

The trouble is mainly in portraiture; the landscapist does not make much use of his camera in the month of November, while the portraitist just now is only beginning to feel the decline of the season rush. And the cause is not defective plates (we do not of course suggest that all plates must be perfect at this time), but atmospheric fog increased to vicious proportions by the insinuating presence of smoke. We have heard a well-known photographer state that there ought not to be such a fog trap as an open fireplace in any part of the premises connected with a portrait studio. Heating appliances, it goes without saying, have to be provided—as who with cold, pinched features can be properly represented in the camera?—but the suggestion is that gas or hot water should be the medium for the introduction of heat. To those who have not observed this closely it is surprising how great an effect may be produced by a trifling whiff of smoke; a sudden closing of a reception-room door or the quick brush past of a lady's dress may cause a slight puff of smoke to dart out, and a few minutes only will then be needed for it to permeate in some remarkable manner every room in the building. In early autumn, before fogs set in, this would soon subside, but when, almost every morning, daylight is ushered in by an atmosphere of fog, there ensues such an intimate combination between the smoke and the water particles that a considerable period of time must elapse before deposition can take place.

We are well acquainted with a gentleman holding these views about fireplaces whose extensive premises receive their chief heating through hot-water pipes, but who was recently at his wits' end how to get negatives with non-veiled shadows. He was experienced enough to know that it was the atmosphere,

and not the plates, that was at fault (and we may say *en passant* that it needs some experience to detect an atmosphere with translucency very slightly injured by the presence of foggy or hazy matter); yet, after going so far as to watch the actual lighting of the only fire that could possibly do any harm, and seeing that no smoke whatever came from it, while the haze was still perceptible, he came to the conclusion that it was the early morning fog that had gained an entrance and not been entirely eliminated. Furious firing of the hot-water-pipe furnace did not appear to remedy the matter in the slightest degree. By chance the cause was revealed. A little-used room on the first floor had its fireplace covered over with brown paper, to keep the dust and soot from falling down into the room, and this paper, which was found to be slightly torn into one or two insignificant holes, allowed the exit of a continuous almost imperceptible fine discharge of coal smoke. And this smoke came from a neighbour's chimney stack. The one open fire and the furnace fire in the photographer's premises required a good supply of air to feed them, and as, on these cold autumn mornings, all outer doors and windows were naturally kept well closed, the readiest mode of access for fresh air was down the chimney. On its way it carried with it the smoke from the neighbouring chimney, and the riddle was solved.

The cause of the baneful effects of an unclear atmosphere scarcely need explaining. In landscape work a little "atmosphere" is desirable: in photographic portraiture it is not. The faintest trace of haze will impress itself before the delicate half tones that constitute so large a portion of the charms of a good photographic portrait are duly secured, and the consequence is that between lights and darks there is little gradation, and at the same time the darks are greatly degraded by the interposition of a thin light veil.

One obvious mode of getting rid of the effect is to have as little atmosphere as possible between sitter and lens, which may be achieved either by using shorter focus lenses, or by inducing the sitter to have a style of picture—such as a vignette bust—as against a three-quarter length.

Again, we know of the plan adopted by one photographer when he finds himself troubled by ineradicable haze is to lessen the amount of illumination in his studio by contracting the area of the illuminating aperture controlled by his screens; he thus, it is true, by robbing his model of light increases the exposure required, but not in anything like the proportion in which the illumination of the atmosphere itself is reduced: hence the veil on the shadows is considerably reduced.

It is, however, quite certain that if the plan of entirely preventing the entry of any light whatever, except that

which falls upon the sitter and his immediate surroundings were to be adopted, fog and haze might be laughed at. Such a tunnel idea, as we have before suggested, might be carried out with little outlay and vast advantage. We fear that the time is far distant when electricity as an atmosphere clearer will be put to practical use, though every one is familiar with the lecture experiment of almost instantly depositing a dense smoke in a bell-glass by submitting it to the discharge from a frictional electrical machine. On the other hand, the electric light, though not illuminating any large proportion of the atmosphere between lens and sitter, enables the operator to produce splendidly clear negatives, though the air be most hazy or foggy.

We will conclude our remarks by drawing attention to a little-noticed cause of haze which recently caused the rejection of a large number of negatives at the hands of a well-known professional, and which may prevail in many a studio without being noticed. The photographic sufferer in this case always employed a pneumatic shutter for making his exposures, and the flap working inside the camera, the outer lens of the combination was constantly exposed to the air. The photographer we allude to is one who greatly deprecates the continual rubbing or polishing of lenses so much in favour with some of the fraternity; but in this case he had carried his objections too far. The anterior surface of his lens had received from the atmosphere a most distinct deposit, semi-milky in appearance, which the exposure of months to the atmosphere had imparted to it, and this film was the means of producing a more or less veiled shadow in his negatives. The moral from this story is that lenses should be kept covered when not actually in use, and that even then their surfaces should be occasionally scrutinised, to observe if there be any need for polishing operations.

WITH reference to an appeal in our last issue by Dr. R. L. Maddox on behalf of the widow and child of the late Mr. I. H. Jennings, we would gladly say a few words. Mr. Jennings was, after many years of public service, thrown, by no fault of his own, into circumstances of the greatest difficulty—into poverty, and even to starvation, as we are informed on excellent authority. He died lately, leaving a widow and child entirely destitute, and on their behalf we venture to press upon our readers the touching appeal of Dr. Maddox. Mr. Jennings's book on *How to Photograph Microscopic Objects* is one of the best text-books on the subject, if not the very best; and the author was to the very end, and even when almost helpless from disease and hunger, a true and ardent scientist. We commend the case to our generous readers as one deserving their notice, and we shall be most happy to receive any sums of money that may be sent to us with a view to forming a fund for the use of the widow and the infant. Dr. R. L. Maddox (Greenbank, Park-road, Portswood, Southampton) and Mr. Andrew Pringle (Baxley Heath, Kent), to both of whom the merits of the case are known, will also be happy to receive gifts for this humane object.

THE reversing prism employed in taking reversed negatives for carbon printing and many other purposes is too expensive for practical use except with lenses of very small diameter. Silvered glass, however, answers every purpose, and we have occasionally described methods of performing the operation of imparting a coating of pure silver to a piece of plate glass by which these mirrors are made. An American correspondent, writing to a contemporary recently, gave a formula for silvering small discs of glass such as those used in mounting microscopic objects, which would be useful for the larger surfaces we speak of also. He adds two grains of nitrate of silver dissolved in a drachm of water to a boiling solution of twelve grains of Rochelle salts in an ounce of water, and after boiling a few minutes filter and makes the bulk up to an ounce and a half. This

forms a reducing solution, the silver solution being made by dissolving forty-five grains of nitrate of silver in an ounce of water, and adding strong ammonia solution till the precipitate first formed is nearly, but not quite, dissolved. To use these solutions, equal parts are mixed together and filtered, and the glass to be silvered placed so as to touch the upper surface of the fluid, the whole arrangement being then placed in the sun or in a warm place. From 100° to 130° Fahr. is the best temperature.

THERE is no patent for the above useful employment of a familiar photographic chemical; but we note that the use of a combination of some other substances familiar to photographers—cyanide of platinum and magnesium—has been patented for purposes that will be of undoubted use to him, that is to say, for indicating the state of the atmosphere as regards moisture. The above salt in solution, in combination with gum, gelatine, &c., is painted upon any desired substance, and when dry remains white; but under the influence of moisture turns to a pink or red, more or less deep according to the amount of moisture present. It is stated that for a repetition of the action the platinum-painted object must be heated after each reddening, so that each time the photographer had benefited by its warning the tablet or other object would have to be "set" again. This adds another to the list of ingenious hygrometers; but be the instrument selected what it may, there is no doubt that an hygrometer of some sort is of very considerable service as regards the state of silvered paper, or the exposure of negatives to the atmosphere, or, again, as a weather indicator for the outdoor operator.

IT will be remembered that at the International Congress of Astronomers held in Paris last April, it was determined to construct a chart of the heavens by a concerted system of working. The chief map was to include stars down to the fourteenth magnitude, and for the thorough obtaining of uniformity each telescope was to be of the same aperture, about thirteen inches, which will give a scale of a millimetre to each minute of arc. The work is being carried on apace, and such progress has been made with the optical instruments that it is expected that ten of them will be ready for use and forwarded to their destinations by the end of next year. It is anticipated in consequence, according to Admiral Mouchez, that the charts will all be completed within the specified time.

THOSE who are familiar with the use of sulphate of mercury as an exciting salt in a galvanic battery have often queried why same salt should not be made which would not give the well-known yellow deposit on the addition of water—why, in fact, the soluble matter extracted, so to speak, should not be an article purchaseable separately. Recently Mr. Schanschiff has patented a salt which is practically the substance in question; he refers to it as "a novel saline preparation." We need not here enter into the exact mode of manufacture, but as it will probably be an article of sale, our readers will have an opportunity of utilising, without loss by precipitation, one of the handiest of all exciting liquids for batteries.

THE remarkable manner in which in many instances photography has, by reason of the non-actinic colour of the writing, rendered plainly legible faded manuscripts, the handwriting of which was almost undecipherable from its paleness, is well known; nevertheless, in any case of copying it is clearly evident that it is desirable to have as dark a colour as possible, hence we may place on record the plan adopted at the Bodleian Library at Oxford for a long time past for restoring faded ink on parchment, &c. It consists simply in painting the faded ink-marks with a solution of hydrosulphide of ammonium with a camel-hair pencil. This is the same solution which some photographers employ as an intensifier, its action following upon the soaking in bichloride of mercury.

SOME time ago we described the performance of an electric lamp of the incandescence pattern, which, instead of succumbing after reaching the maximum time of burning—six hundred hours—which is commonly allotted to a good lamp, had long passed its four thousandth hour, and was as good at the time of writing as when new. The

filament was one of Edison's make, and it is well known that the life of a lamp depends greatly upon the character of the filament whose incandescence is the cause of the light. There can be no doubt that for dark-room work, for example, the longer a lamp will work without requiring changing the more useful it must be, so that every improvement in this direction is worthy of note for the photographer. We observe that a patent has been taken out for an entirely new form of filament, which the inventor has styled erdite. Instead of seeking for the most homogeneous form of organic structure, which, when carbonised, would be stable and regular in electrical conducting power, he breaks ground in an entirely new direction. He makes the filament of any one of a number of common organic substances, preferring to select a material with porous texture, or one having interstitial spaces—thus common slack twisted cotton yarn or thread answers his purpose. It is prepared by soaking in a solution of an aluminous salt, the base of which is then thrown down by ammonia, and the soluble product removed by soaking in water. The whole is then, after drying, carbonised in one of the many accustomed modes. He also makes the thread by mixing an organic salt of alumina with carbon, and a little dextrine to hold all together, the whole being then dried and exposed to a white heat after being pressed through a syringe in the style familiar to the old emulsion experimenter. Every form of improvement in connexion with electrical lighting is to be welcomed, for we are well assured that the use of electrical lighting is increasing, and will continue to increase, in the atelier of the enterprising photographer.

THE PHOTOGRAPHIC EXHIBITION.

VI.

FRANK M. SUTCLIFFE (No. 512), *Study*.—One of a group of seven small pictures, all evidencing a keen perception of artistic composition and effect. In this particular photograph of three sailors grouped on and around a capstan, it will be evident that the pose of the three figures has received much thought, and the result is an artistic study. Captain Abuey, R.E., F.R.S. (No. 519), *Ulrich Kaufmann*.—One of four small portraits of Swiss guides. A departure from the usual landscape work of this exhibitor, but valuable as giving us the actual presentment of men upon whose experience the lives of many mountain climbers depend. Photography, when properly used, is here seen in its capacity to give character and individuality, which is something. G. B. Wood (No. 524), *Chain Gang*.—This title is given to five large puppies chained together. The technical part is good, they having been taken in bright sunshine; but we notice this photograph for the purpose of stating that this American amateur is not so strong in artistic results as he was last year. Few photographers seem to be able to sustain a reputation year after year, and quantity will never compensate for quality. Geo. Scamell (No. 539), *At Pungbourne*.—A small study evidenced by placing two figures in a boat, who do not look at the camera. This picture would have gained if the sky had been toned down so as to lessen the contrast between that and the dark foliage. It is also an excellent example of a good result taken on negative paper.

Ralph W. Robinson (No. 540), *Out of her Reach*.—An old woman about to cross a stream. Well placed in a rather nice bit of scenery, but still that objectionable cutting off the bare tree-stem at the top of the picture is again seen. Robinson & Thomson (No. 543), *Capri*.—A most excellent photograph, toned to a warm brick-dust colour; very unpleasant, because it cannot be like or suggest the natural colour, and where distances are concerned still more out of place. Photographs like this one and No. 544, although very artistic in selection, seem to take away all poetry from preconceived notions of such well-known spots, whose beauty consists in rich colour, which monochrome, and especially this tone, does not realise. Frank M. Sutcliffe (No. 546), *Study*.—This is one of five small studies, where this exhibitor shows how to convert commonplace subjects into something attractive entirely by artistic treatment, and the matter of this particular picture becomes another thing altogether by first of all mentally seeing the result, and then by combining well-chosen contrasted clouds with a number of upright lines arising from buildings and boats, and waiting (ah, there is the mental design!) for a vessel with dark sails

to come into close proximity with the highest lights. Then follows an artistic picture, which is looked upon with intense pleasure both by the painter and the public. A medal has been awarded this picture. C. T. Mallin (No. 551), *Sea Gulls*.—This is the original picture which caused a sensation some little time since. There is absolutely nothing to criticise in it, being the result of chemical work and mechanical appliances which might go on repeating similar facts day by day. Edgar Clifton (No. 552), *The Lea*.—Here we have a picture made out of ordinary matter, where judicious advantage has been taken of a barge on a river to emphasise the leading lines of the subject. Mrs. S. G. Payne (No. 553), *The Secret*.—This is a small picture of a boy and girl walking along a country lane. The girl is speaking to the boy, hence the title, which is not a good subject for children to pose for. The exhibitor is not so happy this year in her pictorial work, the titles of which seem to have been thought of after the photographs had been taken. Ralph W. Robinson (No. 558), *Frost and Mist*.—This is another small photograph, where the mist is indicated by distant trees (a second printing). The two actions of this picture want something to unite them. The mist might have been brought nearer, the front portion being too crisp, but the idea is good.

Underwood French (No. 559), *Promontory of Monaco*.—This is a very soft photograph of a celebrated place. It would be a difficult matter to get anything pictorial out of such materials, and therefore the simple facts are alone interesting. Fred Hollyer (No. 569), *Miss Ellen Terry*.—We are so accustomed to reproductions by this exhibitor that an original study from life comes upon us with pleasure. This is but a small picture, with the face in profile, but the pose and especially the hands are admirable, and whilst intended as a portrait it has been made into an artistic study. Mrs. Brian Hodgson (No. 570), *Living Flowers*.—Two heads of young girls, where original drapery has been entirely concealed by some sheet-like material, the folds of which have received much attention, suggesting antique study; and although the result is not quite satisfactory, yet it indicates an artistic perception. J. Milman Brown (No. 571), *View, Isle of Wight*.—This is from a very pretty bit of nature, and yet this photograph does not quite realise the scene; it looks as if it was made up of thousands of similar sized bits, like mosaic. Possibly another time of day might have given breadth, which we recollect at one time characterised the very good work shown by this exhibitor.

J. B. B. Wellington (No. 576), *Studies*.—Here we have twenty small platinotype photographs taken with a detective camera held in the hand. The subject-matter of each has been well chosen; but why a detective camera was used upon sailing vessels and other subjects we fail to understand. Nevertheless these little pictures are very good, and it would seem that artistic photography at the present moment finds its outcome in extreme opposite sizes. G. W. Tyser (No. 585), *Old Street, Mentone*.—This is a good photograph of old buildings and streets, very picturesque and singular, and reminds one of a bit of Prout, the painter's work. George Hadley (No. 599), *A Connoisseur*.—We notice this picture merely to remark that, although the photographic part may be good, a curious effect is produced by the old antique vases being placed so much apart that with the head of the connoisseur they form six unconnected objects to be considered, which is wrong. Mrs. Brian Hodgson (No. 610), *In an Orange Garden*.—We find in this small photograph a female figure with classical drapery well arranged, but so out of harmony with the rest of the picture that we wonder how she got there, especially as the technical work is not equal to her presence. Benque & Co. (No. 615), *Portraits*.—These consist chiefly of standing figures, in platinotype, on large paper and white backgrounds. They are exceedingly clever in pose and most artistic in the delicate brush work, which has been added as necessary backgrounds to the photographic work. Leonard Blake (No. 618), *Children*.—This frame contains a quantity of portraits by one who last year had a medal awarded to him, but who is now no more. They are very original and artistic in pose.

Rev. H. B. Hare (No. 427), *The Glowcaed on the Usk*.—This picture has been taken at a time when very little foliage was on the trees; it may look very well in nature, but the composition formed by the stems does not produce such a pleasing result as full foliage would have done. This exhibitor is noted for his extreme delicacy of foliage in gradation, which we do not see here, and, in fact, we think that the possible beauty of the original may arise from its local colour,

which photography, alas, gives us faint idea of. The water (on the Usk) has been very well rendered.

Miss E. D. Anderson (No. 618A), *Studies*.—Two frames of some very good photographs, where artistic instinct is evidently struggling to do something. Experience and study will enable this exhibitor to produce far better work in the future. Miss Georgina French (No. 620), *Studies in Venice*.—A frame of six bits of Venice. There is very good work in these studies, which appear to have received much thought and attention, and they convey a better idea of the buildings and the water highways than many other Venetian pictures have done. Teich Hanfstaengl (No. 633), *Portraits*.—Another sample of foreign work from Dresden. There is very little that is good in this "board" of photographs; one large panel portrait in the centre being very nice in pose, profile, face, slightly back view, and arms straight down to hands on knee. Much is due to the picturesque costume and the flowing down of some very long back hair, but its value is spoiled by having other photographs pinned on to it, a foreign idea which had better not be imitated.

W. H. Hyslop (No. 635), *Yachting Studies*.—To this picture a medal has been awarded, and it is most certainly the very best photograph that has been taken of vessels in motion. How many times did the photographer beat about in his vessel before he saw these two racing yachts in good position? And what a position! Both being broadside to the camera, and almost under our feet, implies a quick perception of the picture, and a nervous letting go the exposure, the result being a photograph full of life and most exquisite detail. No. 636, by the same exhibitor, is also a very good photograph, but it would appear in this case he had only to wait for the yachts passing round the turning point, and his work was done. This is a singular instance of objects forming themselves into a picture, and the result is very pretty and most interesting.

We now consider enlarged works and reproductions. Morgan & Kidd (No. 34), *Portrait*.—This is a very fair specimen of argentic gelatino-bromide paper enlargements, the colour being much better than usual. We might take exception to the vignetting, which should not look as if the lower part had been moulded in a basin; but this requires such special capabilities that do not always go with technical excellence. Robinson & Thomson (No. 71), *The Last Load*.—This is a very good enlargement, and the original photograph has been well put together, the white horses coming along with the last load being very strongly contrasted, and thereby made very effective. This picture of English country life should hang upon the walls of many an old farmhouse, it being so pleasant and genial. G. Watmough Webster (No. 90), *Miss Coplestone*.—This is an autotype enlargement, and it does full justice to the original negative, which, although giving delicate detail on white objects, has not increased the depth of shadows and parts in shade. Samuel Fry & Company (No. 161), *Bromide Enlargement*.—This is a tolerably fair example of work which after all must depend upon the original negative. On the taste displayed we are not called upon to make any remark. In connexion with all bromide enlargements it is a great pity that so much brush work, which is far from being artistic, should be found necessary. Marsh Bros. (No. 201), *Horse's Head*.—This is a very good work, and the head is very lifelike in detail; but its pictorial value would have been increased if it had been put into an oval mount. Autotype Company (No. 282), *Tree House, New Guinea*.—This is undoubtedly one of the very finest specimens of autotype enlargements we have ever seen; apart from its very unique subject this work is full of most exquisite detail and soft half tone, the original negative only representing a fact, yet makes up into a very pleasing artistic picture. H. S. Mendelssohn (No. 304), *Grand Duchess Serge*.—Here we have a comparatively small enlargement of a high personage, who ought to make a good picture. There are some strong contrasts in this work which are produced by the brush, and, as we are getting almost tired of stating, are very far from being technically artistic in touch. Eastman Company (Nos. 366 and 418).—Two monster enlargements on bromide paper, which only serve to show what can be done in size by this process, and so far answer a definite purpose in pointing to possibilities for better work in this direction in the future. One thing is right to notice: no attempt has been made to "brush" them up; but why was not better subjects utilised? Autotype Company (Nos. 384 and 403).—These

are two frames of collotypes from negatives by J. W. Lindt, and are exceedingly good specimens of the process; but these pictures possess an unusual interest from their being almost the first contact of photography with mankind in its barbaric state. Boussod, Valadon, & Co. (No. 394), *The Welcome*.—This is a very large and fine example of photogravure to which a medal has been awarded, and where the original intention of the painter seems possible to be reproduced in monotone without the individuality of a translator. There are many other large works by these exhibitors, all very good.

Annan & Swan (No. 410), *Dr. Bonar*.—This is another specimen of photogravure, to which a medal has been awarded. There is also a large work by these well-known exhibitors from a painting by Sir Noel Paton, *Oberon and Titania*, which is very good. Autotype Company (No. 390), *Idyls of the Norfolk Broads*.—These are autogravures, and are more like hand engravings than any other photogravure process; but then they are done from Dr. Emerson's negatives. These exhibitors have also other fine specimens of work done from paintings. Henry Dixon & Son (No. 447), *Orthochromatic Photographs*.—These are copies from oil paintings, and most certainly are very fine examples of the process. These exhibitors have a large variety of other copies on the walls, which all point to success in that work. Andrew Pringle (Nos. 389 and 398), *Micro-organisms*.—A medal has been awarded these exhibits, which are wonderful examples of patience and skill in utilising modern advances in relation to micro-work. F. H. Evans (Nos. 452 and 453), *Photo-micrographs*.—A medal has also been awarded to these frames for photographic work in connexion with photography.

We congratulate the photographic world upon the display of good work which the Photographic Society of Great Britain has been enabled to hang on its Gallery, which, whilst showing much of what the past has done, most assuredly holds out a great promise of better work in the future.

Remarks on Apparatus next week.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

In working up enlargements in colour (be it monochrome or natural colours) the features just treated are not the only ones demanding our most careful attention. No doubt the face and all its component parts are not only the most difficult to master, but they are naturally the most essential portions of a portrait; still there are many other points which must be treated with skill and judgment in order to make the *portrait* a pleasing picture.

The *hair* and *beard*, which we will treat of first, may be considered as part of the face, they are so closely allied to it, but the *draperies*, *ornaments*, and backgrounds must be most skilfully treated (especially when worked in natural colours) in order to harmonise with and generally add to, the beauty of the subject. There are many artists who hold the opinion that there is much more skill and judgment required in painting a really successful background than in painting the portrait itself. There is one thing sure, that a background can make or mar a portrait however good it may be, and we should, therefore, spare no pains in mastering all the details necessary to ensure success in this quarter.

Hair when smooth will appear most glossy, and this glossiness will be rendered in the photograph by a patch of white, in many cases unduly large and shapeless, not in the least preserving the natural characteristics of hair. There are several causes for this, but all turning upon the disposition of the light. If too great an amount of light be used in lighting the sitter this defect will be very palpable, and more than ordinarily so in the cases where the sitters have very dark hair. Now the white patches thus produced will require toning down, and in many instances will lack the character of hair at all, and, therefore, we are called upon to impart this appearance to it. In doing so we must be careful to preserve broadness of effect combined with a certain looseness, as any approach to solidity would mar the effect we are, or ought to be, so anxious to produce. In most cases a broad but thin wash of colour will be found advantageous, and upon this a few effective touches to give character, but never try to represent the individual hairs or we may have the doubtful success

* Continued from page 680.

of procuring *viriness*, a characteristic than which nothing can be more objectionable.

The shadows, too, will require strengthening with a few forcible and vigorous touches, always trying to keep our effects as broad as possible. Sometimes when the print is very deep and powerful, *glazing* will be almost sufficient. That is, instead of making our vigorous touches with a more or less deep colour we simply make them with gum water in such places as will throw up and give effect to the other portions of the hair or beard.

As we treat the hair so we must treat the beard. The latter is naturally more coarse than the former, and must, therefore, be treated with greater freedom. All the light patches must be toned down, and a general effort made to gain the appearance of softness. This may be done by a judicious mixing of the treatments—washing, stippling, and hatching. As in the treatment of the hair, do not strive to particularise too much, but rather to gain the effect of a whole which will more or less truthfully represent nature. In many enlargements the photograph is so coarse that the beard very often is more like twine than hair. Needless to say this must be altered and all made to, as closely as possible, resemble nature. I think there is little more to be said about the hair and beard, so we can pass on to the *draperies*, &c.

Under the heading of *draperies* may be classed not only the certain accessories in a picture but also the dresses, coats, &c., to which we may now direct our attention. In cases where the enlargements are from copies there will be a great deal of work before these parts of your picture will present a satisfactory appearance. They very often, if not always, lack strength and brilliancy. It is, therefore, best to give a general *wash*, and then even up such places as still require it by a broad system of stippling. It is absolutely necessary that the *tone* of the colour used for this purpose should be made to exactly match that of the photograph, otherwise a very unsatisfactory effect is sure to result. Now having matched the colour you are going to *wash on*, to the tone of the photograph, you proceed to work. This wash should be put on with rather a large brush; one made of camel-hair will be found to be the best adapted for this purpose. It will naturally hold a lot of colour, and is so soft that it will not touch any under tone or wash that might have been already put on. The *lights* in all these cases, when occasion requires, should be produced by an eraser. The effect is always soft, and the operation lends itself to the treatment of passing a uniform tint over the enlargement, with the intention of strengthening or giving depth to the plain enlargement. This done, it will be found often that the folds will require emphasising or intensifying. For this purpose the colour should not be too moist nor yet too dry, and the original form should be strictly adhered to. The brush must be used very lightly, or else we will disturb the original wash—a result that would give very considerable labour to put right.

In a good photograph it will be observed these defects will never present themselves. On the contrary, it is little short of wonderful the extreme truthfulness with which the various characteristics of the different materials are reproduced. This texture must on no account be lost sight of, but rather helped out with the greatest care. There is a certain freedom in the treatment of the *draperies*, &c., which is quite legitimate and just. It is left to the judgment of the artist to alter or tone down any objectionable folds, lights or shadows; of course this must never be done at random, but always with the gaining of some artistic purpose in view.

It may not be altogether useless to note a few of the characteristics of the various materials, which may help us as a guide where the photograph may be deficient in detail.

In *cloth* materials the folds are always broad and soft, and, as a natural consequence, the lights and shadows are also broad and soft, with reflected lights between the folds. These lights when necessary can be heightened by rubbing with an eraser, and the shadows deepened in the usual way.

In *silks* and *satins* the character of the folds and the lights are quite different. The folds are somewhat angular, the lights much more brilliant and well defined, the shadows dark and rich with strong reflected light. These features are especially remarkable in satin. Where the lights are not sufficiently strong in the original the use of the eraser will be quite equal to the task of making the necessary alteration.

In photography, *velvet* is somewhat liable to be represented too dark in tone and lacking in detail, and will therefore require some shape and drawing put into it. The highest lights (which are sometimes very strong indeed) will be found on the extreme edges of the folds. Some suggest the putting in of these lights with the aid of Chinese white, but personally I do not hold with this treatment. I do not wish to interdict the use of Chinese white altogether, but I certainly think the less it is used in these cases the better. A touch here and there will give a very great effect, but this will be lost if a general use is made of it. Judiciously used, I think the eraser and the knife will be found sufficient for nearly all the necessary effects. As I always say regarding these matters, it is very difficult, indeed, to lay down hard-and-fast rules, and I can almost say it would be loss of time to try and do so, as so much must always be left to the judgment and skill of the artist. I have known good men who could not use the knife, others who were perfect marvels with it, and both secured splendid results in their own particular way. I think, therefore, it is somewhat wrong to try and force any particular style as being the only and absolutely correct. One can only express their preference for one or other style as it may please them best. The effect of the more intense shadows may be strengthened and enhanced by the use of gum water, or, better still, by a weak or well diluted wash of Newman's "Sizing Preparation," when you have finished your work and it is dry. This latter has an advantage over the gum water, inasmuch as it has not such an objectionable gloss, but harmonizes more completely with the general quality of the photograph.

For all *white draperies* the eraser and knife will be your best friends, with here and there a touch of Chinese white. By a skilful combination of the three, beautiful effects may be realised. Too much of one will spoil, while the introduction of one or other of the others would tend to relieve and heighten the effect.

It will invariably be found best to paint in the *draperies* with repetitions of washes of different strength, reserving your stippling and hatching for the finishing up. By this means it is more easy to secure softness and harmony. The use of too decided dashes of colour may often lead to *hardness*.

In working up *jewellery*, the use of Chinese white is not only admissible but advisable, as you will get minute sharp details with it that the eraser will not give, and for which the use of the knife would be very troublesome, and perhaps unsuccessful. As all articles such as jewellery partake more or less of the nature of a polished surface, the photograph will make the high lights much broader and out of proportion than is consistent with nature. It is one of the cases where photography exaggerates. Of course I am speaking generally, and of work taken in the ordinary way. It will therefore require toning down, and then "pickling out" with sharp and decided touches of Chinese white.

The foregoing naturally bears most upon monochrome. In natural colours the same remarks apply as regards light and shade, but there is naturally greater scope for effect than in the very limited lines of monochrome work. Still, the practice of the latter will be of great help when the student enters on the more extended, I might almost say limitless, area of painting in natural colours. The study of nature never becomes monotonous. Why? Simply because it is so vast. We never feel cramped, new experiences crop up at every turn, and even if we live to a ripe old age, we will find something new to finish up with. One day I was admiring a number of sketches from nature, and made some remarks regarding their freshness, when my artist friend said, "Oh, yes, they are all from nature! But do you know I will lose much of that same freshness when I paint my picture from these sketches; there is no inspiration apart from nature." These were landscapes, and the remarks applied mostly to colour, but in portraiture there is also an endless study.

REDMOND BARRETT.

(To be continued.)

HYDROKINONE.—LANTERN SLIDES.—THE CARRIER.—THE LANTERN.

In last week's JOURNAL I saw hydrokinone mentioned in America as an intensifier. I am glad to see my old friend H. K. coming more to the front, and I hold still the opinion that it will ultimately

supersede pyro. Let your readers try the following formula, which, after making up and trying various modifications, I find the best.

- Soft water 10 ounces.
- Chloride of potash ½ drachm.
- Sulphite of potash (not meta-bisulphite) 1 ounce.
- Tartrate of potash 1 drachm.
- Commercial carbonate of potash 3 ounces.

Thoroughly dissolve all this, and after filtering it through a plug of cotton pushed well down into the neck of a funnel, add hydrokinone two drachms, and filter once more. Proportion to soft water for use for ordinary negatives one to sixteen, and patience *quant. suff.*, as in this proportion it is a slow developer, but I think gives best results. After development has proceeded some time, you may with advantage pour it off, and pour on a fresh quantity. For lantern slides, giving black tones and clear glass, one to eight. Two ounces of soft water, and two drachms of the developer will develop quickly and well three lantern slides, one after the other.

Lantern Slides.—Having to give a local exhibition at a schoolroom, and wanting a few slides as an interlude for the children of a more amusing than instructive character, I bethought me of trying if I could not make them sufficiently good for the immediate purpose from some paper stereograms I have. I selected a dozen and proceeded, but found a difficulty from my camera—nothing long enough to produce them lantern size; but an idea struck me, which answered admirably. I screwed the lens I was working with—viz., a Dallmeyer's wide-angle doublet, 7¼ × 4½—inside my camera instead of outside, using it really, I suppose, as an enlarging lens (?), and then my subject seven and a half to eight inches from the lens, on a rough miniature easel I knocked up, and the camera drawn out to about the same. I got capital results, even making allowance for copying from paper.

The Carrier.—I have altered that to enter the slides from the side instead of above, and can use one half of some good glass stereos. The best results are obtained by taking off the ground-glass and replacing it with plain. They are just as good for the stereoscope by having a loose piece of ground-glass to put in with them to the stereoscope, and when used for the lantern the half holds quite firmly in the carrier—of course the other half projects into the room.

Finally, the Lantern.—"Ament the lantern's murky smell" which everyone complains of. Mine, do what I would, was nearly useless in the drawing-room, but in a lucky hour I had recommended to me by a tradesman in the neighbouring town a substance without a name to put into the domestic duplex lamp. I said I would try its virtues, one of which was the removal of smell, so I thought the most severe test would be my Sciopticon, three wick. It answers beyond all expectation. Clean the lantern thoroughly—as ought always to be done with all lamps, we know—put half the sixpenny packet into the reservoir and shake it up; let it stand about six hours before use, and if every one succeeds as well as I have done, they will think it a boon indeed. The name of the maker on the packet is Lynch & Co., 8, Carpenter's-lane, Manchester, and it is "originated by Professor Beck."

Greenhithe, Kent.

W. T. F. M. INGALL.

ORTHOCHROMATIC PHOTOGRAPHY.

[A Communication to the Photographic Club.]

NOTWITHSTANDING the many statements that have been made with regard to the use of orthochromatic plates for outdoor work, that they were bound to be far superior to the ordinary plate, I think sufficient time has elapsed to have enabled photographers to have fairly tested them for that purpose; and what has been the result the present Exhibition will show, with one exception, that orthochromatic plates have not superseded others as yet. And why is this? In many cases they have found but little difference between them and the ordinary plate, and, again, many have found that the use of them entails much greater care in manipulation that they are not worth the extra trouble and cost in using them.

One great advantage of orthochromatic plates (in conjunction with a yellow screen) is photographing outdoor subjects on a slightly foggy day; the result on an ordinary plate being flat and foggy, on the orthochromatic, crisp and brilliant. But for landscapes with distance, if used with a yellow screen (especially on a clear day), the charm of distance is gone by losing what we call atmosphere and bringing it sharp and clear; and, again, with shadows which are usually of a bluish grey nature, are rendered much darker than they appear, so that if used at all for landscape a great amount of judgment and experience are necessary. But I admit in some cases it is an advantage to render distance clearer, especially on those occasions when there is too much atmosphere. I think I may fairly state that this is the most difficult branch of anything connected with photography. But when we come

to photographing flowers or other close studies in colour, as well as copying paintings, then, to get the best results, their use is absolutely necessary.

We are now approaching the season when, if orthochromatic plates are to prove of any use at all for landscape work, their value will become apparent. I refer to the beautiful tints of yellows, browns, and shades of red, which we see on the foliage at this time of the year, one tree with its sere and yellow leaf standing out in bold relief against some darker green tree which has not yet begun to put on its autumnal robe. I know many have been waiting to try the effect of this latest discovery in photography for this purpose, and I have taken this opportunity of bringing before you two new formulæ which will enable you to try for yourselves whether there is any real value in the process for outdoor work. I think it would prove interesting if members were to bring the results of their trials in this direction before the Club; an ordinary plate should be exposed at the same time.

What I specially claim at present is the use of quinine in conjunction with the dyes for the purpose of prolonging the keeping qualities of the stained plates, and also treating the dye itself with chloral hydrate. In fact, quinine has many other advantages in connexion with photography, and no doubt before another year has elapsed we shall have many uses to which quinine will be put. One little use, or novelty I perhaps should say, I discovered only a few weeks ago, and which will serve as a short paragraph for the coming ALMANAC.

My formula, although working satisfactory, might, with advantage, be made less complicated, at least for those who wish to make it up; but I hardly see my way of doing so at present so as to keep all the existing good qualities in it, and I thought it would be a pity to wait till all further experiments were completed, as every one knows that experiments create experiments, and so we may go on almost for ever.

The two dyes which I propose to bring before you are cyanine, which is well known, and methyl violet. Cyanine, in my opinion, has a greater range of colour sensitiveness than almost any other dye, and is most useful in copying paintings, where, as a rule, a large amount of red is to be found. This dye is particularly sensitive to red, and sufficiently so to green (I am referring to copying, and not to the spectrum), which is not the case with erythrosine, which barely extends beyond the yellow, being quite insensitive to red; and, moreover, this dye (cyanine) has no action on the gelatine like some other dyes, but develops clear and brilliant as any ordinary plate.

Between cyanine and methyl violet there appears to be but little difference in colour sensitiveness. The cyanine is a trifle the more sensitive to red. On the whole, perhaps, methyl violet is preferable to use, not only on account of its price (which is one-fortieth that of cyanine), but it appears to me that when it has commenced to develop the sensitiveness to yellow is somewhat destroyed, and more yellow light can be used in developing than is the case with cyanine. But great care must be taken when dipping the plates, placing them in the dark slides and again into the developing dish, which should be done in almost total darkness. This applies more forcibly when using cyanine.

Now to come to the formula of cyanine. I find by treating it with chloral hydrate and again separating by means of ammonia it is much improved, and does not precipitate when added to an aqueous solution, which untreated cyanine does, as many no doubt know who have tried it. Take—

- Chloral hydrate..... 1 ounce.
- Cyanine 10 grains.
- Water..... 4 ounces.

Boil together in a water bath, when the cyanine will be found to be dissolved. Keep stewing for twenty minutes, then add one ounce of liquor ammonia carefully; ebullition takes place, and chloroform is liberated, therefore it is advisable to do this in the open air. After a few minutes the cyanine will be found adhering to the sides of the vessel, the supernatant liquor being carefully decanted away, the residue being rinsed one or twice with water. Eight ounces of methylated spirit is now added to dissolve the cyanine, together with 120 grains of soluble sulphate of quinine. Dissolve the latter by heat in a small portion of the spirit first. Finally, filter through a small filter paper. The solution will keep as long as a dipped plate, namely, about four to six weeks.

For dipping take of the above—

- Cyanine solution 1 drachm.
- Liquor ammonia 1 "
- Water, distilled 20 ounces.

A weaker or stronger solution may be used to suit various plates. The weaker it is the longer will the plates keep. As a rule a plate

of medium rapidity will be found easier to work than one of extreme rapidity. The cyanine is added to the water, the drachm measure washed out, the drachm of ammonia next measured out and added to the cyanine and water, with stirring. If the ammonia is poured into the same measure which contained the cyanine, a precipitate of quinine takes place, which does not happen if in a diluted form, thus the reason of adding the cyanine to the twenty ounces of water first, and finally the ammonia.

For a half-plate take two ounces of the above diluted solution and flow over the plate, and keep rocking for two minutes, after which throw the solution away. On no account must the same be used for another plate, as great irregularity will result in the rapidity and colour sensitiveness of the next plate. This applies to all dipping operations. The plate now dipped is to be dried in total darkness.

For methyl violet the treatment required is somewhat different. The dye used by itself produces fog, which baffled me for some time to get rid of, but finally I succeeded by treating it with an oxidiser, such as bichromate of potash, and then proceeding as with cyanine, viz., by treating it with chloral hydrate. But this latter treatment is not absolutely necessary; in fact there is so little difference worth speaking of that you may as well disregard this latter treatment. Take—

Methyl violet.....	10 grains.
Water.....	4 ounces.
Bichromate of potash	$\frac{1}{2}$ ounce.
Water.....	2 ounces.

Raise both as near boiling as possible, and mix. Keep in the water for half an hour, collect the precipitate by filtration, and wash by passing water through the filter. By this treatment it is no longer soluble in water, as was the original. Dissolve the filtrate in methylated spirit containing 120 grains of the soluble quinine sulphate and filter.

For bath take—

Methyl violet solution	1 drachm.
Ammonia	1 "
Water, distilled	20 ounces.

To get any decided effect at all on orthochromatic plates, a yellow screen is necessary, but many people imagine they will show correct rendering of colour without any screen at all. I have not yet seen the gelatine plate that will do so. Almost any yellow dye will answer, some better than others. I have a liking for turmeric, which I prepare as follows:—

Turmeric	1 ounce.
Methylated spirit.....	7 ounces.

Digest on a water bath for twenty minutes, and allow to stand a day or two to settle, then decant the clear solution off, about four ounces, and add to this four ounces of methylated ether and fifty grains of pyroxyline. This will make the stained collodion. Coat a piece of patent plate $3\frac{1}{4} \times 3\frac{1}{4}$ —ordinary glass should not be used owing to its want of flatness, and with which it is difficult to get a sharp image—take another similar piece of glass and cement the two together by means of Canada balsam, the glass being slightly warm. I have to thank Mr. Debenham for the suggestion of Canada balsam. It not only reduces the reflecting surfaces, but it also renders the film more transparent as well as protecting the film from injury. Clean away the balsam that oozes out, and mount as an ordinary lantern slide. This should be kept in the dark when not in use, as turmeric is bleached by the action of light. I prefer to use it behind the lens, as then it is protected from the light, and the folds of the bellows will prevent it from falling down. With this screen the exposure will be increased about ten times.

Any of the usual modes of development will suit, but I must again caution you to expose the plate as little as possible to the light of the developing room. With these precautions I can ensure success to any who may try it. J. B. B. WELLINGTON.

THE PERMANENCE OF PHOTOGRAPHIC PRINTS.

[A Communication to the North Surrey Photographic Society.]

I HAVE received several very kind invitations from our friend Mr. Senior to attend one of your meetings and have a chat with you on some photographic subject. I was afraid that none of the subjects that I have been working at lately would be of much general interest, but he thought that the question of the probable permanence of photographic prints done by the various printing processes in common use at the present day, would be interesting. Anyhow, I hope it will lead to a useful discussion afterwards.

The position of the photographic amateur of the present day about to decide upon the best printing process for him to use, is something like that of a young man I met the other day in a photographic

dealer's shop. He had come up from the country to get all the necessaries to set up as an amateur photographer. In his bag he had got catalogues and price lists from, I should think, every dealer in London. The poor fellow had spent hours in studying those books, and was evidently fast qualifying for the post of inmate to a lunatic asylum, when, as he told me, "his mamma suggested that he should come up to London and see the cameras, &c., and he would be able to judge, then, which was best." He had come up, and when I met him he had been to three or four shops, the owners of which had each explained the advantages of using the only perfect camera in the world, and had advised him (as a disinterested friend) not to have anything to do with any of the rubbish generally met with. Need I say that the poor fellow was in a bigger fog than ever. So it is if an amateur seeks advice as to what printing process to use. An old photographer would probably tell him that if he wants quality he must print on albumenised paper, that he himself had been working at it for the past thirty years, and ought to know something about it by this time. So he ought, but somehow some of them do not. The Platinotype Company's people would not be able to understand how any one but a born idiot could think for one moment of printing in anything but platinum.

If the said amateur were to wander into Soho-square, at No. 13 he would be informed that if he wanted anything simple, effective, and profitable he must use the Eastman permanent bromide paper; whereas if he called on Messrs. Marion, at No. 23, they would advise him to use the Britannia—no, I beg pardon, they might think they had got a better brand than that in stock now, or at least something they would prefer to recommend; then, if he got down as far as Richmond or Kingston, he might almost get to think that those London fellows had been trying to take advantage of his innocence.

Well, gentlemen, I will now tell you, as a photographic amateur, and I believe unprejudiced on the subject, how to my mind the rival claims of these different processes appear to stand as regards their practical use to the professional as well as the amateur photographer, and then we will go into the question of probable comparative permanence. First, as to ease of working. With the professional a printing-out process is probably as expeditious as any other, because a large number of negatives can be printed from at one time. Platinum prints more rapidly, but then one cannot attend to so many frames at once; besides, with the less exposure required (especially with the ever changing strength of daylight) the more the prints are liable to get over printed. But with most amateurs the trouble of printing is due to its having to be done in the daytime. For such the bromide paper is just the thing, because it can not only be done of an evening, but there is the interest attaching to the development, which I consider the most interesting part of photography.

The next subject is, "Certainty of Result," and I must say that I do not believe that any process will displace the albumenised paper print in the professional's printing room unless it enables him to see the result during the printing. With his work there must be no uncertainty or waste. With the amateur, however, the question is rather different, because he has not the experience of the professional printer to enable him to take advantage of the means of dodging a negative, which a printing-out process allows.

If you will allow me I will just show some of the amateurs present a few methods how a print can be improved after being taken from a printing frame. First as to printing in clouds. The greatest mistake photographers as a rule make, is to over cloud their prints, and so detract from the interest in the landscape; if you have large masses of white clouds in your picture with well defined forms, they will attract the eye more than anything. All that is required is a suggestion of clouds to act as a background to the landscape, and to carry a scale of tones through the picture.

Other ways of improving a print are when there are two subjects of equal brightness, or if there is any bright light near the edges of the picture, such as a pathway, by just tinting it the picture will be much improved. With the aid of a clean duster to screen parts of the print from the light, a picture can be worked up by tinting the lights and deepening the half tones and shadows, which would have been quite useless as it left the printing frame, and it is as interesting as working up a picture with a brush. It is the inability to do this that to my mind is the great drawback to platinum printing; indeed, I think it is almost safer to trust to time exposures by an artificial light of known power with the bromide papers than to have to depend on a chance exposure to varying daylight with platinum. I think you will agree with me that the charm of a picture depends very much on these delicate half tints. Understand me, I am quite aware that platinum is capable of producing these tints in a most marvellous manner—the present Pall Mall Exhibition proves this most conclusively—but how often do we see a print which would have been

improved by a little dodging if one could only have seen what was necessary during printing.

As to printing on bromide paper, I am inclined to think that in time it will take the place of the platinum, because it has not the curse of the latter in having to be so carefully kept from the damp; besides, I am in hopes that soon we shall be able to so control the action of the developer as to be able to build up the picture to what we require during the development. There is a good deal of experimental work to be done in this direction. Only last week I coated some paper for the purpose of taking this subject up again.

I will tell you what I am driving at. I want to be able to take a fully exposed bromide print and do with my developer something like what an artist does with his colours, viz., build up the picture to my own liking, and be able to stop the action of development at any part of the picture—while a shadow requires to be deepened on, more detail brought out in another. I do not think this is a wild, idle dream. Some time ago I was working in this direction, with, I think, some hopes of success. On these plates you will see that although the whole of the plate had the same exposure I controlled the action of the developer over the different portions, and in one case prevented the action of the developer at all on the darkest part of the picture. I hope soon to have time to work at this subject again, and if we can control the development of our prints we shall then be able to dispense with the advantages at present given us by the prolonged exposures of the printing-out processes.

And now for the question of permanence. But mind you, if we could not get good results with platinum or bromide of silver, I would prefer to keep to our old friend albumenised paper. I would rather have a print I could admire for a few years than be troubled with an eyesore for a lifetime. Some time ago you may remember a discussion took place in the columns of THE BRITISH JOURNAL OF PHOTOGRAPHY as to the correctness of the manufacturers of the Eastman bromide papers in calling it permanent, and as I was trying experiments with different formulae of bromide of silver for paper work, I thought I would put prints by the different processes to the same test. I first thought of getting samples of the different papers and printing all from one negative, but then I decided that it would not be fair to judge any process with which I had had no experience by prints of my own preparation. I therefore obtained prints on Alpha, argentotype, Eastman, and platinum papers, done either by the manufacturers or their acknowledged agents. I also obtained a number of prints on fresh and ready sensitised albumenised paper, and some bromide of silver prints of my own preparation with different proportions of silver bromide and gelatine. These were all put in a sealed bottle with a sponge filled with water, and sulphuretted hydrogen was passed into it for nine days. I am very sorry now I did not keep them all, but as I only did it for my own information, I have only a few of the pieces on this card which I kept for references, but there are enough for you to see the characteristic result from each process. There are other destructive tests besides sulphuretted compounds which I have applied to these prints—oxidising agents, such as permanganate of potash, the effect of which you will see. Of course with such a test as chromic acid, platinum was the only one which could stand it.

And now, to conclude, I must say that I was thoroughly staggered with the Eastman paper prints. When we think that they had been subjected for nine days to a humid atmosphere of sulphuretted hydrogen, which practically destroyed the albumen prints, yellowed the whites of the platinum prints, and changed the bromide and others as you see, I am sure that you will agree with me that the colour of the image on the Eastman paper has actually improved, without any loss of density, and the whites have not yellowed. These two latter points are most surprising. Some of Monckhoven's "enamelled double transfer paper" was tested at the same time, and had yellowed slightly.

I feel convinced that there is some secret in the preparation of the Eastman paper that gives it a permanence which I, for one, cannot obtain with bromide of silver alone, to say nothing of the beautiful rich black image so characteristic of an untouched Eastman print. I need hardly say that I have no interest whatever in any of these processes. I simply show you these results of my experiments, and leave you to judge for yourselves.

HERBERT S. STARNES.

THE GENESIS OF GELATINE EMULSION DRY PLATES.

THE ABOLITION OF WASHING SHREDDED EMULSIONS.

IN those particulars, recently published in these pages, about the first gelatine emulsion dry plate for alkaline development, prepared by me in January, 1868, it may have been noticed that the decomposition of

the nitrate of silver was effected in a cold instead of a warm gelatine solution, to meet the requirements of certain hypothetical speculations which led to the performance of the experiment. This trial revealed the fact, that when chloride of cadmium was so used to effect the precipitation, the gelatinous quality of the liquid was destroyed, whether it be so or not with other chlorides. The suggestion was published in 1863 that perhaps the nitrate of cadmium formed destroyed the glutinosity. Another explanation may be that the precipitate carried down with it the small proportion of cold gelatine present, for we have it on the authority of Herr Plener, in about the most philosophical paper on emulsions read of late years before any English photographic society, that in emulsion processes a small proportion of gelatine enters into adhesion or combination with the precipitate, and is afterwards inseparable by the centrifugal machine or any other appliances. These various facts derived from different sources raise the question to my mind, whether by effecting the precipitation in a cold solution of gelatine of proper strength enough gelatine may not be carried down to permit good re-emulsification with additional plain gelatine, or, in other words, whether gelatine emulsion may not be washed quickly by precipitation in the form of damp powder, instead of being washed in shreds, to the great saving of time and trouble in preparing dry plates. Therefore, as my experiment in preparing the first gelatine emulsion dry plate for alkaline development contains evidence in favour of this idea, the present lines are written to invite the attention of dry-plate makers to the present suggestion, for I have not leisure just now to devote personally to experiments with emulsions.

The observation of 1868 as to the destruction of some of the qualities of gelatine by nitrates and by alkaline chlorides has since been confirmed by the high authority of Mr. Wilson, in his memoir to the Photographic Society upon the process which won the Paget prize for the best dry plate at the public competition of 1880. He said:—

"The addition of the gelatine after boiling should be made when the boiled emulsion and the dissolved gelatine are both at as low a temperature as possible, and between the time of this addition and that of washing the emulsion it should be kept as cold as possible. The reason of this appears to be that the excess of alkaline bromide has a most destructive effect on the new gelatine, and therefore the lower the temperature and shorter the time during which the two are in contact the better. . . . A plain solution of gelatine in pure water is very little injured by prolonged boiling; but if an alkaline bromide (or chloride) be added it is speedily decomposed. Probably the alkaline nitrate, which is present in the emulsion in large quantity, may be even more effective."

From the foregoing statement it appears that there would be great advantages if the soluble chlorides and nitrates, and decomposed organic matter, could be poured off before adding the fresh complement of pure gelatine. The principle I have hereby suggested for trial may reduce the time and expense of making dry plates.

M. GAUDIN'S EARLY EMULSION PLATES.

Mr. Jerome Harrison recently pointed out that M. Gaudin, of Paris, devised a gelatine emulsion in 1861, but he did not give an exact reference to the original record, which I have found and examined since writing my previous article. It is pleasing to bear of such early researches originating in France, the birthplace of photography, the home of elegance, refinement, and the highest civilisation in the world—"The chosen home of chivalry, the garden of romance."

Mons. M. A. Gaudin was the editor of a journal entitled *La Lumière*, published twice a month at 9, Rue de la Perle, Paris; the periodical was regularly on sale in London at 5, Doctors' Commons, St. Paul's Churchyard. In its issue of April 15, 1861, M. Gaudin published therein an article entitled *Photogène à la Gélatine*, which I translate as follows:—

"I give the name of *photogène* to a mixture sensitive to light, which contains at the same time nitrate of silver in excess and iodide of silver in suspension. Gelatine, which can be mixed with nitrate of silver in all proportions without being altered, is the substance most suitable for making a *photogène*.

"To prepare the composition, melt at a gentle heat in a deep glass vessel, ten grammes of white gelatine in one hundred grammes of common water. When all the gelatine is dissolved, add five grammes of crystallised nitrate of silver. On the other hand dissolve two grammes of nitrate of silver and precipitate it as iodide of silver by the addition of a soluble iodide; the precipitate is thrown upon a paper filter, and washed with water for some time; the washed iodide of silver is then added to the argentiferous solution of gelatine, and is beaten up therein for a certain time until it forms a homogeneous liquid which, when spread upon glass, gives a film having the appearance of sensitised collodion.

"Before using the *photogène* it is filtered warm through a glass funnel with the bottom lightly plugged with a tuft of cotton wool,



Medal.]

CAROLLING.

“ This Carol they began that hour,
How that a Life was but a flower
In Spring-time.”

[H. P. ROBINSON.

LETTERS
TO THE
REVEREND

THE

SECRETARY

OF THE

AMERICAN

ASSOCIATION

OF

through which alcohol has been passed to remove grease, and afterwards water to wet it.

"The opalescent filtered liquid is distributed while warm on plates with an albumen substratum, as I have directed for collodion.

"Photogene prepared in these proportions is very fluid and sets upon the glass as readily as collodion. Its great fluidity, favoured by its temperature, leaves upon the plate an infinitely thin film, as uniform as that of the glass itself. After the plate is coated, it is placed vertically to dry, resting upon blotting-paper.

"If the proportions of gelatine and iodide of silver be increased, it is necessary to apply photogene at a higher temperature, for the film must be as thin as possible.

"When the photogene becomes cold, it sets and can be placed in the camera, only the development cannot be commenced until it is sufficiently dry not to be injured by contact with the finger.

"The image is developed by covering the plate with a concentrated solution of filtered tannin; it comes out in general without the addition of silver, but it is better to add several drops of nitrate of silver a little after the immersion of the plate in the tannin bath.

"By this method the image appears exactly like one upon plates prepared with albumen; but if the gelatine expands, and if the sensitive film be not extremely thin, its surface will become frilled, and the finer details will be destroyed.

"The image comes out at first a somewhat red colour, and changes gradually to a very intense bistre.

"Photogene is slow in receiving impressions, almost like albumen; the image is also very long in appearing.

"The mixture should be prepared and applied by candlelight, and kept from the light of day, under the influence of which photogene turns brown and becomes useless without being revived; it can be restored by the addition of a few drops of bromine water, which, after agitation therewith, restore its clear yellow colour.

"Photogene distributed upon a glass and allowed to dry spontaneously, serves, like albumen, for the taking of positive transparencies.

"The hyposulphite fixing solution must be very weak, of the strength of five per cent., for it tends still more than tannin to make the film frill. After abundant washing, the plate is dried again by artificial heat, then varnished in the ordinary way."

From the records so far examined, it seems that before 1868 the few negative gelatine plates tried contained an excess of nitrate of silver, and received acid development in the attempt to substitute gelatine for pyroxyline, and to leave the rest of the process like that in common use with wet collodion. M. Gaudin, however, knew that his plates, with excess of nitrate of silver, could be dried, and with tannic acid development could be used for the printing of transparencies. M. Gaudin has certainly published the earliest information about the frilling of gelatine plates.

In his opening article about *The Discovery of the Gelatino-Bromide Process*, Mr. Jerome Harrison mentions still other pioneers, without giving references to their channels of publication; Gaudin's foregoing article I searched out, but Mr. Harrison would oblige me by telling me exactly where to find the original memoirs of Gustave le Gray and of Dr. Halleur.

W. H. HARRISON.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 14,859.—"A Portable Camera Stand Top." W. ROWLAND.—*Dated November 1, 1887.*

No. 14,921.—"Combined Magic Lanterns." J. BATTERSBY.—*Dated November 2, 1887.*

No. 15,142.—"An Improved Method in Carriers for Optical Lanterns for Working and Centering the Slides in same." W. H. HUMPHRIES.—*Dated November 7, 1887.*

No. 15,153.—"An Improved Method of Adjusting the Front Slides of Photographic Cameras." R. OVERTON.—*Dated November 7, 1887.*

PATENTS COMPLETED.

A NEW OR IMPROVED ADJUSTABLE DIAPHRAGM FOR PHOTOGRAPHIC CAMERAS.

No. 3879*. WILLIAM JAMES LANCASTER, Colmore-row, Birmingham.—*March 19, 1886.*

My invention relates to photographic lens diaphragms, employed in photographic operations to determine and regulate the amount of light that shall be admitted into a camera; thus the time of exposure in photographic operations depends upon the light upon an object about to be taken and the size of the aperture of the diaphragm used with the lens.

Usually a series of various sized diaphragms are employed, or rather a series of diaphragms with various sized holes. This is objectionable, inasmuch as there is no means of varying the difference between the size of one aperture and the size of one above or below it, so as to give a mean difference.

By my invention the diaphragm is made adjustable, so as to be able to control the size of the aperture according to the varying requirements and will of the operator; thus the aperture in the diaphragm is expanded or enlarged in such a manner that an infinite variety of apertures can be readily obtained.

The diaphragms, or series of plates which constitute the diaphragm, form a part of the mount of the lens, thereby avoiding any loose diaphragms or parts whatsoever; and further, the aperture necessary for certain conditions of light can be predetermined by an index finger, before the former of which the latter travels.

The adjustable diaphragm is constructed as follows:—

Within the inside, and crossing the lens tube, is a circular plate or disc with a hole in its middle of the full size which the aperture in the diaphragm can acquire. The diaphragm is a compound or segmental one, made up of a series of thin plates overlapping each other, but so disposed or arranged with respect to each other that their radial curved inside ends or parts enclose a circular, or nearly circular, space or opening; so that on the concave or curved inside edges of the ends of these plates being moved or made to approach each other, a greater or less aperture or hole is thereby produced.

The parts constituting the diaphragm, and the manner in which the curved or crescent inside edges of the plates are made to approach and recede from each other, is as follows:—

Each plate of the series of plates consists of a plate concave at one end to the radius or about the radius of the larger sized aperture which the plates will make when fully opened out or expanded. This curved part forms the inside end of the plate; the other or outside end is pivoted or hung eccentrically upon the inside of the disc, with a hole in its middle as before described. The said pivot forms a centre upon which the plate turns inwards or outwards, in approaching or receding from the centre of the lens tube; and situated below, and somewhat in a line with the said centre, is a stud or pin upon the face on the side of the plate, which engages and works within one of a series of radial tangential slots cut within a plate or disc with a hole in its middle which works or is moved in front of the series of plates by a protruding arm or finger working through a slot cut in the outside tube of the lens.

Each of the said plates constituting the diaphragm are pivoted, and have studs like the one described, and each of the said studs of the series work within the slots as described; and, further, each of the plates overlap each other, so that the edges of the one extend over the edges of the other, so as to form, as it were, a solid plate, but with an aperture that is able to be increased or decreased in size at pleasure.

Upon the top outside of the lens tube, and in front or surrounding the slit through which the finger works, is an index or graduated scale before which the finger is moved, so that a person can, by moving the finger in front of one or other of the numbers or figures upon the scale, have the size of aperture required. Thus the top scale may be 4, 6, 8, 10, 12, onwards, and bottom or second line "speed" 1, 2, 3, 4, &c.

The moving of the index finger or arm through a quadrant of a circle for closing, or for obtaining a smaller aperture, the studs on the plate of the series of plates, which may be six, eight, or any other suitable number, are made to travel down the tangential slots or slits, and each plate is at the same time turned inwardly upon the pivots upon which they are hung, thereby causing the curved inside ends to collectively approach each other, and make a contracted aperture. When a larger aperture is required, the arm or finger is only required to be turned in the reverse direction, when the plates are collectively made to slide over each other, and recede from the middle or axis of the lens, by turning eccentrically upon the pivot upon which they are hung, and by the studs on their sides travelling up the slits on the disc or plate wherein they are formed being partially rotated.

A supplementary disc, with a hole in its middle, comes in front of the plate with the tangential or inclined slits, in order to preserve or protect the same from injury or otherwise.

The claim as amended is:—Combining with a lens tube an adjustable diaphragm, in a photographic camera substantially as and for the purpose herein described. Also providing combined lens tubes and adjustable diaphragms with graduated scales or equivalents thereof, for the purpose substantially as described and set forth.

IMPROVEMENTS IN AND CONNECTED WITH PHOTOGRAPHY AND THE TREATMENT OF PHOTOGRAPHIC PRINTS OR PICTURES.

No. 16,327. JOHN URIE, Senior, and JOHN URIE, Junior, 83, Jamaica-street, Glasgow, Lanarkshire.—*December 13, 1886.*

OUR invention has reference to and comprises a new or improved mode and means or arrangement of mechanism for developing, clearing, toning, fixing, or other ordinary chemical treatment or washing of photographs, which have been previously exposed and printed, by artificial or other light, in long lengths, bands, or webs of sensitised paper or fine-surface cloth, or other web fabric, all by and while traversing the said webs or bands at a constant, regulated speed, simultaneously through the required well-known chemical and other liquid baths required for the various purposes stated; which improvements will produce work of more uniform excellence, and save much time and labour, as compared with the modes and means heretofore in use for treating said photographic prints, singly or in short lengths containing a few prints, in the various baths at different times.

The improvements of our said invention consist all as follows:—According to one arrangement and adaptation suitable for treating the photographic printed bands of paper for book illustrations up to twelve inches or so broad, we take the photographic bands, as printed in the photographic printing machine or otherwise, and wind them on to rollers to be put into journal bearings in a dark box, and fed forward to and through the new developing and treating process and arrangement of mechanism; or when the printed bands are delivered loose into dark boxes, these may be removed to, and passed through, a pair of feeding-in rollers at the entering end of the new arrangement of mechanism. The web or band of printed paper from the said dark boxes and supply-rolls or feed-rollers, is led over guide and reversing rollers placed over and within the said developing and other treating baths, ranged in their proper sequential order in advance of each other, as required to be used, on a table or platform, which would preferably be in the form of a tray to receive and convey away any liquid that may be spilt. The baths would preferably be constructed in a deep narrow form for getting the greatest and best action of

the chemicals with economy of materials, and so that the deposit would settle to the bottom and not pervade the whole bath; while the traversing of the paper would always cause a motion of the liquid, which would also aid in maintaining the liquids in the baths in a uniform state throughout for action. The web of photographs would in this way be led over the said upper guide rollers and down under the rollers in the lower part of the baths, and may be thus undulated up and down one, two, or more times within the bath to give a longer or shorter time of treatment within the bath, as within the first or toning bath, which takes longer than either the second or clearing bath, or the after-toning or fixing baths, or the intermediate washing baths. Beyond the fixing bath the drawing and delivery drum or roller would be mounted by its central shaft in journal bearings in side frames, preferably mounted in a portable form over a cistern of washing water, so that the web of photographs would be led over the sides and upper surface in a moist state from the fixing bath, and be delivered down into the water-washing cistern on the front side. The drawing drum would be considerably larger than the width of the widest paper to be treated, and preferably large enough in diameter to give sufficient circumferential surface that it could draw the web paper over the guide and immersed rollers and through the several baths by the gripping action of the wet paper on its surface, and deliver it into the washing bath below. But for large machines and wide webs of paper, weighted drawing rollers might be laid on top of paper and drum to assist the gripping action. This drawing and delivery drum, which pulls the paper through the machine, would be driven either by motive-power machinery, or it might be by clockwork, or other gearing actuated by weights or springs at a uniform time speed, regulated as desired by the driving cone pulleys, when motive bands are used, or by small oscillating fan blades; or, it might be, a brake on the high-speed gearing of the weight or spring clockwork mechanism when that is employed; or a shifting pendulum might be used on an escapement motion, or other equivalent governor which would regulate the velocity of the gearing to actuate the drawing and delivery drum at the desired speed, the paper was wished to be drawn through the baths for the time being. To further regulate the time, the paper web and prints would be under treatment in the several baths to perform their respective operations, the undulating and guide rollers immersing the paper within the baths may be mounted on portable frames, which can be raised and lowered into the baths to give a longer or shorter time traverse of the material through the baths; or the baths might be fitted with movable siphons, which would regulate the height of the liquid within the baths higher or lower, to act on the paper for the greater time length of the traverse of the paper through them. Or by another arrangement—in some cases the paper on leaving one bath might be passed over a movable raising and lowering guide roller before allowing it to enter the next bath; or by an equivalent arrangement the baths might be removed further from each other, and in either case allow the paper photographs to be under the action of the chemicals in the last bath for a longer period, after leaving one bath before entering the next.

Any of these arrangements might give a nice adjustment as to seconds of time under which the photographic prints might each be under treatment within the respective baths; while the speed at which the drawing and delivery drum actuated the paper might regulate a mean speed of the traverse of the paper, which would suit the treatment in the baths generally for being otherwise regulated, as stated, within the individual baths.

Although deep, narrow baths have been described as being generally preferable, for giving longer chemical action or treatment with the least amount and waste of the mixtures or liquid employed; yet many other forms of baths might be employed to give the same effect, as by making a wide, broad bath, and immersing an inverted close hollow vessel within it, with the guide rollers at its under edges or angles to keep the paper immersed and clear of either the lower or upper vessel, the immersion of this upper vessel, which might be hung by cords, and counterweights, and pulleys, so as to immerse it to any desired depth with the bath, raises the liquid higher or lower within the narrow side spaces through which the web was made to travel, thus giving a longer or shorter action of the chemicals on the paper. For giving a more uniform strength of the chemicals and action in each bath, a cistern of the mixture would preferably be mounted a few feet or so above the top level of their respective baths, and a rubber or other pipe led down to each bath from its cistern above, controlled by a small tap to regulate the supply of liquid to the bath and keep a motion of liquid through the bath. A lower cistern would also be fitted below each bath for allowing the overflow liquid from each bath to pass down to the lower cistern, the liquid from which might be occasionally removed, or forced up by air pressure into the upper cistern to keep up the constant current through the bath, the drawing-off pipe or siphon regulating the height of the liquid within the bath.

Although only one drawing and delivery drum or rollers has been described, other intermediate drawing rollers might be employed to lessen the strain on the web of paper, these secondary drawing rollers being driven at the same speed as the others by bands and pulley, which bands might be tightened by a movable spring pulley, to regulate the driving tension and allow the bands to slip on their pulleys when the strain on the paper became too great; and tension cords or friction levers might be employed on the spindles of the supply rolls or rollers to keep the web tight.

The claims are:—1. The construction of a machine or general arrangement and combination of the parts, of mechanism for mechanism for chemically treating, or developing, clearing, toning, fixing and washing photographic prints or pictures traversed at a regulated speed continuously in a web or band of paper or other web fabric, all substantially, as herein described, in reference to and shown in accompanying drawings. 2. For the chemically treating and washing of photographs in a continuous web or roll, the use of drawing and delivery drums, driven at a regulated speed, for carrying forward the web of paper, either with or without spray jets of water for removing and delivering the paper from the surface of the drawing drums, substantially, as herein described, in reference to and shown in accompanying drawings. 3. For the chemically treating of photographs in a continuous web or roll, the traversing of the web through deep or other baths, which would regulate the duration of time the web was under treatment, substantially, as herein described, in reference to and shown in accompanying drawings.

IMPROVEMENTS IN PHOTOGRAPHIC PRINTING.

No. 16,356. GEORGE JOSEPH SERSHALL, 371, Lodge-road, Hockley, Birmingham.—December 14, 1886.

THE object of this invention is to produce finished photographs in such a manner as to represent portraits or views apparently laid or placed in certain positions upon the face of larger photographic views, landscapes, or floral scenes, all forming one photographic combination picture on the same sheet of sensitised paper.

For this purpose, in accordance with this invention, if two views, portrait and view, or two portraits, are required to be represented as lying upon parts of a larger view, or if it be required to represent a view portrait or scene as lying upon part of a larger view, and this latter view as lying upon a still larger view and forming together one combined and complete photograph, the process for its production consists of two or more stages, each stage being in itself a separate and distinct operation in photographic printing. For each of these two or more operations a separate and distinct mat or mask, having a part or parts of its surface sufficiently transparent to transmit light, with the other remaining portion or portions of its surface rendered opaque or sufficiently impervious to the passage of light, and with both transparent and opaque parts specially arranged as to position and configuration—is required in each of the said operations to be placed in the printing frame between the negative and the sensitised paper to be printed upon. The transparent portion or portions of the surfaces in each of the said mats or masks is made to coincide in shape or configuration with the marginal line bounding the part of the negative required to be printed at one of the operations in the process of printing hereinbefore mentioned, and the opaque surface in each of these mats or masks blocks out or completely obstructs any transmission of light to those parts of the sensitised paper which may have been already printed in any previous operation or operations, or which during the pending operation are required to remain blank for a future stage or future stages in the process and with the appliances constituting this invention. These two or more operations in the said process being completed as herein indicated on one sheet of sensitised paper, the photograph containing the subjects so combined is toned and finished in the ordinary manner. The said mats or masks may be produced as follows: a drawing of the outline forming the margin or edge of the intended transparent portion or portions of a mat or mask is made upon any suitable material or medium to be used for lithographic, copper-plate, letter-press, or other suitable method of printing, and the surface surrounding the said outline and bounded off by it is so prepared or treated that the imprint or impression taken from it is blank or opaque, leaving blank a space or spaces of the figure or figures of the transparent portion or portions of the surface required in the mats or masks. The mats or masks may, therefore, be produced by printing upon any suitable material already transparent, or in which the blank portion or portions of its surface may be made transparent by varnishing after the opaque part or parts have been printed in like manner as before, and which the varnish being dry is then fit for use as shown herein.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. The process of producing photographic combination pictures upon the same sheet of sensitised paper by means of a series of photographic mats as herein described. 2. The mode of producing photographic mats by printing upon any suitable material, those parts of the said mats which are required to be opaque, the blank portions being either transparent before the said process of printing or subsequently rendered so by varnishing after the completion of the said process of printing as herein described.

PROCESS FOR PRODUCING FROM PHOTOGRAPHIC AND OTHER DESIGNS ENGRAVED PLATES ON ROLLERS FOR PRINTING.

No. 16,476. MARY WALKER and GEORGE EDWARD WALKER, Anchor Pottery Longton, Stafford, and JEAN BAPTISTE GERMEUIL BONNAUD, Longton.—December 15, 1886.

IN our specifications, No. 13,609 of 1885 and 2770 of 1887, we described means of producing copies for lithography from photographic or other designs. Our present invention relates to a process whereby the operations described in these specifications are applied, along with further operations, to the production of engraved plates or rollers for printing. For this purpose the pellicule produced, as described in the specifications above referred to, consisting of a sheet of paper or a film of collodion, and having on it a layer consisting of a mixture of dextrine, starch, and kaolin, on which a tracing has been made with lithographic ink or crayons, is placed face downwards and pressed on the plate or on the surface of the roller that is to be engraved. The body of the pellicule or film is then removed, leaving the lithographic ink or colours of the drawing on the plate or roller. On this is electroplated a metal, which is less easily attacked by acid than the metal of the plate or roller itself. Thus, if the plate or roller be of zinc, copper is electroplated on it; if it be of copper, gold or platinum is electroplated on it. The metal thus deposited appears only on those parts of the surface which have none of the lithographic ink or colour. By applying a solvent, such as turpentine or benzine, the lithographic ink or colour is removed, and the whole surface is then treated with acid, whereby the parts which had been occupied by the lithographic matter are etched to any desired depth, the rest of the surface formed by the less corrosible metal remaining unaffected by the acid.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, we declare that what we claim is:—The herein-described process for producing engraved plates or rollers for printing, by transferring to the surface to be engraved the design lithographed on a film or pellicule, removing the body of the film or pellicule, leaving the ink or colour of the design, electroplating the surface, dissolving out the ink or colour of the design, and etching.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
November 15 ..	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
" 15 ..	North London	Myddelton Hall, Upper-st., Islington.
" 15 ..	Bolton Club	The Studio, Chancery-lane, Bolton.
" 16 ..	Bristol and W. of Eng. Amateur	Queen's Hotel, Clifton.
" 16 ..	Bury	
" 16 ..	Hyde	Mechanics' Hall, Hyde.
" 16 ..	Manchester Club	
" 16 ..	Edinburgh Photo. Club	5, St. Andrew-square.
" 16 ..	Photographic Club	Anderson's Hotel, Fleet-street, E.C.
" 17 ..	London and Provincial	Mason's Hall, Basinghall-street.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. James Glaisher, F.R.S., President, occupied the chair.

The following new members were elected:—Dr. E. W. Alabone, Messrs. W. M. Baylis, M. Boussod, J. J. Briginshaw, G. W. Catt, V. H. Chintanore, Lyonel Clark, A. Deed, R. F. Dixon, W. R. Few, C. F. Fischer, M.D., W. W. S. Follett, G. E. S. Fryer, H. J. Gifford, A. J. L. Grimes, M. J. Harding, W. Hayes, B.A., Mrs. Brian Hodgson, Messrs. E. D. Lavender, E. J. Lezard, H. Little, Rear-Admiral Matiland, Messrs. Gustav Mullins, Paul Nadar, E. W. Parkes, W. Scorer, H. Senier, E. W. Shepherd, J. G. Sinclair, W. Tomlinson, J. Watson, J. B. B. Wellington, J. Whittaker, and The Hon. Lewis S. Wingfield.

Prize medals were then presented by the President to G. P. Carlland, *Elephants, &c.*; Henry Tolley, *Lovely Shore*; H. P. Robinson, *Curwelling*; T. A. Green, *English Lakes*; H. Collis Pettit, *Lakeland*; J. F. Roberts, *Stage Scenes*; W. J. Byrne, *Direct Life-sized Heads*; Frederick Müller *Enlargement*; Andrew Pringle, *Micro-organisms*; Bonssod, Valadon, & Co., *Photogravure*; P. H. Emerson, *The Poacher*; Annan & Swan, *Dr. Bonar*; J. B. B. Wellington, *Studies*; P. H. Evans, *Photo-micrographs*; Frank M. Sutcliffe, *Studies Series*; W. H. Hyslop, *Yachting Studies*; Arundel & Marshall, *Plate Boxes*; Eastman Film Company, *Stripping Films*; and J. Gale, *Lantern Slides*.

Mr. ANDREW PRINGLE, in returning thanks for his medal, said that, although he had difficulty in being present that evening, he felt it to be a necessary duty. Some friends had been kind enough to express astonishment at the quick way in which he had surmounted the difficulties of photo-micrographic work, and he felt it to be his duty to explain that he had received help therein of the most valuable kind from a man who was well known, and who deserved to be better known—Dr. Maddox. Without his help he would have been unable to produce such good specimens. Dr. Maddox had taught him by letter, and had sent him objects to photograph.

Mr. W. H. WALKER, upon receiving the medal for the Eastman Film Company, said that he had had great trouble in producing stripping films in a commercial way. It was an afterthought that they were sent at all, as they were not originally intended for exhibition.

The CHAIRMAN, in some remarks about the more meritorious exhibits, spoke of the lenses by the Taylors, of Leicester, and said that young men should be encouraged to grind their own lenses. The English microscope had grown because of competition, the one maker improving upon the work of the other, until foreigners had been habitually beaten in some of the international competitions. He wished to see the same thing in photographic lenses, because it would mean progress.

Votes of thanks were then accorded to the Judges of Pictures, of Apparatus, and to the Hanging Committee, and also to the Assistant Secretary.

The PRESIDENT remarked that the Hanging Committee had not had their fair share of scolding this year. He had never known such a thing before. He then announced that the Exhibition would close on Monday, November 14. It had been affected this year by the meetings in Trafalgar-square, but had so far received 9600 visitors, and 252*l*. Last year 271*l* had been received; still, before the present Exhibition closed, he hoped that it would exceed that of last year in spite of atrocious weather and of atrocious gatherings.

Mr. BUCHANAN WOLLASTON said that there was a desire to know whether the Mr. Parkes elected that evening was connected with the Cellier Syndicate or not.

The PRESIDENT did not know.

Mr. W. S. BIRD responded that it was the same Mr. Parkes.

A MEMBER said it was a pity that this had not been known before the ballot box had gone round.

The proceedings then closed.

CAMERA CLUB.

On Thursday, November 3, an address, accompanied by a demonstration, on *Intensification of Gelatine Negatives with Mercury followed by Schlippe's Salt*, was given by Mr. W. E. Debenham. Mr. Francis Cobb occupied the chair.

The demonstration proved most interesting to those present, and several comparative experiments were shown by Mr. Debenham. The gradations of increased intensity obtainable by the method, and the easy means of reducing by hypo any excessive treatment of the plate with the iodide of mercury, were well illustrated. The only doubt which arose was as to whether the treatment left the film of the plate and the shadows of the negative stained. This appeared to be the case slightly in one case, though inappreciable in all others, the stain possibly arising from imperfect washing prior to intensification. The process has been already fully described in THE BRITISH JOURNAL OF PHOTOGRAPHY.

Some discussion and conversation ensued, Mr. LYONEL CLARK making interesting and useful comments upon the subject, and the members and

friends present then gave Mr. Debenham very hearty thanks for his practical illustration of so useful an intensification method.

Thursday, November 17, is a lantern evening, when slides will be shown at eight p.m. by Messrs. Newman (Swiss views), Fison (Norwegian views), C. B. Wright (Norwegian views), and Evans (Exeter Cathedral views), and by other gentlemen.

On November 24 the subject will be *Enlarging*, paper by Mr. F. P. Rodgers.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

On Thursday, November 3, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. W. H. Prestwich presided.

Messrs. W. Wallis, P. Everett, and J. Joel were elected members of the Association.

The HON. SECRETARY announced that at frequent intervals papers on photographic subjects will be read, and that the following members have agreed to contribute memoirs:—Messrs. J. Traill Taylor, W. M. Ashman, Hume Nesbit, F. A. Bridge, E. Clifton, Norman Macbeth, W. H. Harrison, J. W. Wharton, W. Cobb, J. J. Briginshaw, David Louis, F.C.S., C. H. Trinks, and Andrew Pringle. The last Thursday in each month will be devoted to lantern subjects. The annual dinner will take place in January.

Mr. J. W. Wharton exhibited some photographic prints.

Mr. NORMAN MACBETH remarked that in one of them a column rose too near the centre of the plate; the print could be improved by cutting off a part of one of its sides so as to bring the column out of the centre.

Mr. L. MEDLAND said that one of the prints proved the value of a backing to the plate when taking interiors, for where the backing had not quite covered the plate the negative was less sharp.

Mr. J. TRAILL TAYLOR suggested that a large wedge-shaped white bank which projected in one of the pictures might be improved during the printing by deepening the shade at places upon the bank.

Mr. Higgins exhibited views of Lisbon and other places.

Mr. F. W. COX asked the best focus of lens to use for half-plate pictures.

Mr. MACBETH used an eight-and-a-quarter-inch rapid rectilinear, but would prefer one of longer focus; the one he employed would not do well for objects less than twenty yards off. The tendency of the times was to use lenses of too wide an angle.

The following question from the box was then read:—"Captain Abney, in his work, *Photography with Emulsions*, makes the following assertion respecting the use of iodide of silver:—"I am in a position to say that an emulsion of silver bromo-iodide can be made just as sensitive as the emulsion silver bromide as regards the ordinary so-called actinic rays, and can be prepared so as to be perfectly unacted upon by the orange or red rays, which is a step in the right direction, according to my way of thinking." Again, in the *Photographic News Almanac* for 1885, he writes as follows:—"Iodide in gelatine emulsions is the thing to give a negative all the qualities that are essential for it to be pronounced first-class." How can this be reconciled with the claims made on behalf of orthochromatic plates, which are supposed to render the yellow, orange, and red more correctly, and to subdue the violet and blue? Does the experience of members of this Society, so far as landscape work is concerned, agree with that of Captain Abney?"

Mr. W. COBB preferred some iodide in emulsions.

Mr. W. M. ASHMAN thought that the questioner was comparing two totally different things; it was possible to have a little iodide in orthochromatic plates, although several workers preferred plain bromide.

Mr. COBB added that Mr. B. J. Edwards had stated that a little iodide in orthochromatic plates did no harm, and Mr. Hyslop considered it to be an advantage. He (Mr. Cobb) preferred an iodide to an orthochromatic plate for landscapes.

Mr. A. COWAN imagined that the dates of the two quotations given from Captain Abney's writings might be very wide apart.

Mr. ASHMAN was using plates which probably contained an excessively large proportion of iodide of silver; their peculiarity was that they would give a good plucky negative when the daylight was nearly gone and men were beginning to light the street lamps; the plates would not work so well in a good light.

Mr. COX exhibited a platinum print with clouds printed in from a second negative; the effect was good.

Mr. F. A. BRIDGE, to get rid of halation, used a piece of wetted black tissue laid upon the back of the plate; before development he simply peeled the tissue off and laid it aside.

Mr. W. H. HARRISON had once had a severe test object for halation, consisting of a wire rope stretched high in air across the River Reuss to aid in utilising the force of the stream to propel the ferry boat between the banks. The rope had a grey sky for the background except where some towers of the old city wall of Lucerne projected upwards; wherever the rope crossed these towers it looked twice as thick as where it had the sky for a background. But for this the negatives would have been considered to be totally free from halation. By means of glycerine he next put the backs of some plates into optical contact with pieces of black mackintosh, yet upon exposing such backed plates upon the same subject the defect was not removed or even ameliorated; why so he did not understand.

Mr. Medland exhibited a lantern slide taken upon a Beechly plate; by lapse of time the original grey image had changed to a warm colour.

Mr. TAYLOR once had a negative which changed so by time that observers were in doubt whether it represented *Conway Castle* or *Christ Blessing Little Children*.

Mr. HIGGINS backed plates with a mixture of glue, treacle, and lampblack.

Mr. TAYLOR called attention to alleged advantages of the metal plate boxes lined with paper for which the Photographic Society had just awarded a medal.

Mr. COBB thought that paper in contact with gelatine plates had a deleterious effect.

Mr. H. M. HASTINGS thought square-shaped grooving bad. Mr. BRIDGE had had plenty of gelatine plates kept long in contact with paper without injury.

Mr. COX thought that when forcing became necessary in development marks of packing paper were more liable to show.

Some other members having spoken, Mr. TAYLOR said that he gathered it to be the opinion of the meeting, 1. That the invention was not an improvement. 2. That it was not novel. 3. That it was a retrogression. He spoke of the legal responsibility of plate makers as to the quality of their plates, and called attention to a New York case in which with one developer all the films slipped off the plate, and with another developer they kept on and gave good pictures.

Mr. ASHMAN thought it impossible to render makers responsible; if one man complained of plates they could always bring experts forward to depose that other plates from the same batch were good.

Mr. COOKE knew a photographer who had received plates with all the films off the glasses.

Mr. COBB stated that it was in the experience of every plate maker that one photographer would get good negatives upon plates which gave bad ones in the hands of another photographer.

Mr. EDGAR CLIFTON did not see on what principle a jury could assess damages. One man might take bad plates to Richmond Hill and another man take them to South America, the latter incurring infinitely more loss than the former, indicating widely different penalties for the same offence.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Committee of this Association met on the 3rd instant to consider the following case, which had been brought forward at the previous meeting and adjourned for inquiries:—

Early on Tuesday morning, October 18, the body of a man was found lying on the grass in Hyde Park; he was pronounced by Dr. Blackett to be dead. A letter was found upon him the contents of which were as follows:—"My dear Wife,—God the Almighty forgive me! Without work, diseased in mind and body, I am forced to give up my miserable life. He will protect my poor wife by good people's counsel and assistance. Farewell, dear Mary, till we meet again where there is no ill or sorrow.—M." The wife was communicated with, who stated deceased had been well-to-do, and earned much money years ago as a photographic artist, but of late years trade had been bad, and his circumstances became worse and worse.

This case was recommended by a donor under Rule 4, which gave them the privilege of recommending for the consideration of the Committee cases of non-members. The Secretary reported he had investigated the case, and found the widow perfectly destitute and without any friends to assist her. They had been married thirty years. For the last year they had existed in a condition bordering on starvation owing to the want of any regular employment.

The Committee, after careful consideration, granted the widow the sum of 5*l*.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual general meeting of this Society took place on Tuesday, November 1, at Myddelton Hall,—Mr. J. Traill Taylor, President, in the chair.

The HON. SECRETARY, Mr. H. M. Smith, read the annual report, as follows:—

In presenting their annual report your Council congratulate the members of the Society upon the success attending its proceedings since its reorganization at the commencement of the year, and upon the fact that the Society has gained for itself an established position among the Metropolitan societies.

The Society now numbers eighty-nine members, including eight honorary members, who, being members of the original North London Association, which ceased to exist in 1869, were recommended by your Council for election.

The meetings of the Society have been well attended, the average number present being thirty-six.

During the year lectures and demonstrations have been given upon the following subjects:—*Photographic Lenses*, by the President; *Cameras, Ancient and Modern*, by Mr. E. Clifton; *The A B C of Emulsion Making*, by Mr. A. Mackie; *Stripping Films*, by Mr. W. H. Walker; *Photography, Past and Present*, by Mr. E. Dummore; *Systems of Numbering Photographic Slides and Lenses*, by Mr. O. Smith; and on *The Preparation and Development of Colloido-Bromide Emulsion Plates*, by Mr. A. Mackie.

Well-attended outdoor meetings have been held every Saturday during the summer season, and on the various Bank Holidays. On some of these occasions opportunity has been taken to join with other societies, and this Society was well represented at the outdoor meeting of the Photographic Societies of London held at Watford on the Queen's Jubilee day.

In consequence of the appreciation of the lantern exhibitions held during the early months of the year, your Council have acquired a good optical lantern, which they trust will induce more members to devote attention to the production of lantern transparencies. Many of the difficulties incidental to the practice of this branch of the art have been removed by the introduction of suitable commercial plates and modifications in development; and the suitability and simplicity of the colloido-bromide emulsion process for this purpose have been amply demonstrated at the meetings of this Society. It is, therefore, hoped that during the coming season the lantern exhibitions will grow in extent and interest.

The question box has been in constant requisition, and many interesting and profitable discussions have resulted therefrom. Questions on almost every point in photography have been dealt with and much valuable information elicited. Young members are earnestly requested to avail themselves to the fullest extent of this method of seeking information, especially where the question may appear to them trivial, such questions sometimes leading to important results.

The Council have steadily borne in mind the avowed purpose of the Society, and have endeavoured to place before the members as much information as possible in a readily accessible form, thus making the Society a thorough school of photography, where the veriest tyro may have his difficulties explained away and the most experienced veteran may find kindred spirits with whom to discuss the more abstruse points of our art-science.

It would be impossible in a record of our year's doings to omit some reference to the thoroughly amicable manner in which all have worked together for the general good, and it is hoped that this kindly feeling will always be a marked characteristic of our Society, while beyond their own walls the members have been cordially received by the older London societies.

Your Council desire to express their thanks to those members or visitors who have read papers or exhibited objects of interest at the meetings, and to particularly acknowledge the courtesy of the photographic press, which, by inserting reports of

the Society's meetings, has enabled the general public as well as absent members to keep touch with our proceedings.

The HON. SECRETARY then read the Auditors' Report, which showed a balance in hand of 8*l*. 3*s*. 8*d*.

On the motion of Mr. JOHN JACKSON, seconded by Mr. O. SMITH, the foregoing reports were then adopted.

Votes of thanks to the retiring officers and the Auditors were passed and suitably acknowledged.

The following officers were elected for the ensuing year:—*President*: J. Traill Taylor.—*Vice-Presidents*: A. Mackie and E. Clifton.—*Curator*: E. Traill Hiscock.—*Council*: F. W. Cox, W. Few, J. Humphries, J. Jackson, L. Medland, J. Nesbit, J. Oakley, and F. G. Reader.—*Hon. Secretary and Treasurer*: H. M. Smith.

On the motion of Mr. F. W. COX, seconded by Mr. J. HUMPHRIES, it was resolved to alter Rule 11 to enable nine members to call a special meeting of the Society instead of twelve, as previously.

On the motion of Mr. A. MACKIE, seconded by Mr. H. M. SMITH, it was decided to alter Rule 13, to prevent any member whose subscription was unpaid three months after application from voting upon any subject connected with the management of the Society.

The PRESIDENT announced that the next meeting of the Society would take place on November 15, when Mr. F. W. Cox will deliver a lecture on *The Platinotype Process*. Visitors are invited.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE first ordinary meeting of the year was held in the Society's Rooms, Masonic Hall, on Tuesday, November 1,—Mr. T. S. Ycomans, Vice-President, occupied the chair. There was a very good attendance of members and friends.

After a prolonged discussion arising out of the minutes, the monthly competition, "Animal Life," postponed last month, was proceeded with, and the prize awarded to Mr. S. B. Lowe. For the picture for the month, subject, "Old Buildings within Ten Miles of Sheffield," the prize was awarded Mr. W. H. Bacon for his view of the ruins of Sheffield Manor.

WALLASEY PHOTOGRAPHIC ASSOCIATION.

THE first annual meeting of this Association was held on Wednesday, the 2nd instant, at the new address, 12, Bradford-terrace, Seacombe,—Mr. H. Wilkinson in the chair.

The CHAIRMAN, in a short address indicating the progress of the Association during the past year, felt that he could not do otherwise than congratulate the Committee upon the prosperity which the Association had enjoyed since its inauguration on October 15, 1886, and warmly thanked them for the ready manner in which they had assisted him on difficult occasions such as commonly beset the path of a young society; he also felt very confident that the past prosperity would not only continue but would be enhanced during the ensuing year. He was happy to say that the attendance of members at the meetings had been an extremely good one, and, speaking for himself, and he might almost say for them all, these meetings had left many pleasant reminiscences behind them, not to mention the numerous valuable hints which from time to time were mutually imparted; and in this connexion he could not refrain from mentioning that, although atmospheric conditions were not the most propitious at this time of the year for outdoor work, there remained plenty of scope for occupation in bromide-paper and lantern-slide development. In conclusion, he pointed to the satisfactory condition of the finances, as shown by the statement before them.

The HON. SECRETARY then stated that twenty meetings of the Association had been held, at first weekly, but subsequently monthly, at which later interval it was decided the Association should continue to assemble. During the summer there had also been held eleven outdoor meetings, chiefly in the Wallasey district.

The HON. TREASURER then submitted his financial statement, which showed a balance in hand of 1*l*. 5*s*. 4*d*., which he thought the meeting would agree with him in considering very satisfactory for a first year's working.

At this point the usual votes of thanks to retiring officers were made; but, before proceeding to the election of the officers for the ensuing session, Mr. FROST suggested that some memento of their first year should be obtained; and he suggested the insertion of the portraits of the members for the past year in a large mount, which should subsequently be framed. This motion found a supporter in Mr. E. MAYALL, and, after a short discussion, was carried unanimously.

The elections were then proceeded with, all the old officers being re-elected, and Mr. J. W. Gregg appointed Assistant Secretary, whilst, before the close of the meeting, it was decided to have a supper, at which the prizes should be distributed to the successful competitors in the recent competition, the result of which were as follows:—"Landscape," Mr. G. B. Frost; "Animal Study," Mr. T. Hill; "Marine View," Mr. G. B. Frost; "Portrait," Mr. E. S. Wilson; "Instantaneous," Mr. J. Walker; "Village Cottage," Mr. G. B. Frost.* According to the rules of the competition no competitor can take more than one prize, and the prizes in the classes marked * go to Mr. Ashurst and Mr. Nicholson respectively.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, November 16, will be on *Rolling and Burnishing Photographs*.

The first meeting of the one hundred and thirty-fourth Session of the Society of Arts will be held on Wednesday, November 16, when the opening address will be delivered by Sir Douglas Galtou, K.C.B., D.C.L., LL.D., F.R.S., Chairman of the Council.

THE LATE MR. FRED. SNARY.—We are sorry to learn of the demise of Mr. F. SNARY, the oldest photographer in Bristol. His death, which occurred on his fifty-eighth birthday, arose from an abscess in the foot, which eventually showed signs of mortification. An operation was performed, but it proved fruitless. By his genial temperament, happy disposition, and courteous manner, he won friends on all hands. He died on the 29th ultimo.

Correspondence.

Correspondents should never write on both sides of the paper.

NOVEMBER MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE.—THE DELAY GRANTED FOR ADMISSION OF EXHIBITS TO THE FORTHCOMING WORLD'S SHOW OF 1889.—EXHIBITION OF BRUSSELS.—PINHOLE CAMERA AND PROOFS.—TWO PLATES GAVE DIFFERENT RESULTS UNDER THE SAME MANIPULATIONS.—M. PECTOR ON THE KEEPING QUALITIES OF GELATINO-BROMIDE OF SILVER PLATES.—THE PRESENT EXHIBITION IN PARIS.—A NEW AND CHEAP SET OF LENSES ("TROUSSE").—A NEW CAMERA.—ENAMELLED TRAYS.—A PORTABLE DEVELOPING TABLE.—LUNAR PHOTOGRAPH.—VIEWS OF THE EXPLOSION OF FIREWORKS, BY M. LE COMMANDANT MOESSARD.

The Photographic Society of France held their monthly meeting on Friday evening last, the 4th instant, M. Davanne in the chair.

A great deal of time was taken up in discussion on the Universal Exhibition of 1889. It appears that claims for space cannot be accepted after February 1, 1888, and that a longer delay must not be thought of. Notice to English photographers who desire to win fame at the forthcoming World's Show.

A great International *Concours* will take place at Brussels in 1888. The awards to be given amount to 500,000 francs; moreover, a great lottery, in which a million of francs will be spent in purchases from the products shown in the exhibition. The French photographers and amateurs will not think of doing anything in the way of exhibiting. At the present moment they are biding their time for the great Exhibition of 1889. At the present moment "l'Union Centrale des Arts Décoratifs" has a very pretty exhibition on in Paris, to which all photographers were invited; but the result is deplorable, and cannot be compared to the magnificent Photographic Exhibition at 5A, Pall Mall, London, which I had the extreme pleasure to inspect during my last visit to London.

M. le Dr. Martini de Turin sent some magnificent landscapes, which he had obtained by a pinhole camera. The focus was twelve centimetres, the exposure twenty seconds. These images were far superior to what I saw in London.

Mr. Sturme's publication, entitled *The Photographer's Indispensable Handbook*, was laid upon the table.

M. Vidal presented, in the name of a gentleman of Limoges, two *clichés* of the same objects, one being a good negative, the other being a positive. This gentleman says the plates were from the same batch, were exposed the same time, and developed in the same solution. One was a negative, the other turned out to be a positive. "Why is this?" he asks. A discussion took place, but to say the phenomenon was clearly explained would be going too far.

Professor Stebbing exhibited a metal dark slide, sent to him by Mr. W. Tylar, the inventor. The metal slide created great interest, and was generally approved of, excepting the weight.

M. A. Gorde exhibited a new "trousse" of lenses for landscapes, not unlike Darlot's *trousse*. It is composed of the body of the lens bearing a circular disc perforated with holes of different sizes, serving as diaphragms, and four *lentilles planes* with focuses of 15, 25, 35, and 45 centimetres. The one of 15-centimetre focus will cover a half-plate 13 x 18, the 45 centimetres will cover 40 x 50. I forgot to put the question to M. Gorde as to whether or not other focaenae might be obtained by combining such lenses. As an instance, screwing on the front focus 25, and on the back of the lens focus 15, which would give a focus of 10. This is found by adding the two focuses together, 15 and 25 make 40, divide by 4 leaves 10; near enough for all practical purposes. The 25 and 35 can be used together in the same manner, as well as 35 and 45, the last giving a focus of 20. It has been found necessary to put the higher number outside and the lower inside to get the best results, if M. Gorde's lens can be so worked. The *trousses* of other makers can be worked thus, and give a great power to a landscape photographer or amateur by allowing him to have what size image upon his plate he desires without changing his camera from the position he chose in the first instance. Thus, an amateur wishes to take a picture of a castle with ruins, &c. A river prevents him getting as near as he could wish. He has a half-plate camera, and a lens of 15-centimetre focus. On his looking upon his focussing glass, the image of the castle and its surroundings are too diminutive; He unscrews the No. 1 (15 centimetres) and screws on No. 4 (45 centimetres); he now finds that the whole image cannot be portrayed, the focus is too long; he then takes No. 3 (35 centimetres), and all is harmonious. The disadvantage of these lenses is, that in order to have sufficient sharpness a very small diaphragm must be used. M. Gorde told us the market price of his *trousse*, which is the cheapest I ever heard of (35 francs). He sent round a certain number of proofs, which were very good. Among them I remarked a view of the interior of the Exhibition now on in Paris—it was about 12 x 16 inches—a most remarkable view; the foreground, which could not have been more than six yards from the operator, was, as well as the rest of the picture, perfectly sharp and faithfully delineated.

M. Pector, speaking of the keeping properties of gelatino-bromide of silver plates, showed us a number of proofs which he had obtained from plates he purchased in 1885, which plates had been abandoned in his country-house all the winter to damp and cold; nevertheless, the results obtained were perfect.

M. Davanne read a long communication from Professor Aimé Girard, on the means he employed to obtain photo-microscopic images to be used as projections to illustrate his public lectures, and orders were given that it be published in the *Bulletin* of the Society.

M. Darlot, the well-known and highly esteemed optician, presented a new kind of camera for instantaneous work. The new features consisted of a very small camera on the top of the larger one, with a very small lens; the image from this lens is reflected upwards upon a small ground-glass, upon which the operator can follow all the changes of the moving object or objects he wishes to catch, and at the propitious moment let fly the instantaneous shutter. Naturally, all that was seen on the small ground-glass is reproduced in the large camera. The plates are all placed in a brass framework, and fit into a changing box having an exit and an entry. The exit is for plates to be exposed; the entry for the exposed plates to take their place behind the unexposed plates. This method allows the operator to take a great number of plates with him.

M. Maugin presented a number of enamelled trays, fitting one into the other. The remark was made that they were very good for laboratory purposes, but too heavy to carry about.

M. Fauvel presented a portable developing tray, which, when folded up is represented by Fig. 1, when opened by Fig. 2. It consists of a hollow



Fig. 1.



Fig. 2.

box, supported upon four legs of the same form as the ordinary camera stand. Inside the box is an oscillating frame, upon which is placed a transparent glass tray of the negative to be developed. The frame with tray is kept in motion by means of a long bar of iron (A), to which is attached a heavy weight, and does the office of a pendulum. On the end near the operator is a mirror (B), which can be set to any angle. At the other end of the box is placed a lantern (C), having an angle cut off (D); on this is placed the red glass. The lantern can be raised or lowered at will. The operator is supposed to begin work: he lights his lantern, places his developing solution in the glass tray, and by means of the mirror reflects all the red rays emerging from the lantern through the bottom of the glass tray, and in consequence, when the operator plunges the plate into the developing solution, the formation of the photographic image can be seen and followed with the greatest ease. The pendulum is made to swing backwards and forwards so as to keep the developer in constant motion. It is to be noticed that the lantern in its actual position cannot throw direct rays upon the plate during development. If the operator desires to see the progress of the image by reflection, he has only to raise the lantern a few inches to obtain the desired result. The box not only holds the lantern and developing tray, but contains places for solutions, measures, &c. In fact, it is a compact and handy accessory to the dark room as well as to the amateur on a tour.

The Commandant Moessard gave us a long description of experiments he had followed up in photographing the moon as it passed through the heavens. He sets his camera at one of his windows, and as soon as the orb of night rises he uncaps the lens and allows the moon to print its portrait across the plate. Several were projected by means of the lantern; the different curves which the moon had followed in its different phases, together with the quantity of light emitted or eclipsed by passing clouds, &c. On some of the plates not only was the passage of the moon registered, but also the paths of the stars could be distinctly seen. The value of these experiments was criticised in an astronomical point of view. The same gentleman showed us a number of proofs which he had obtained of the fireworks at the *fête* of Versailles. Very interesting, but as the camera had been left open the sharpness of the picture naturally suffered. My opinion is that a better result would be obtained could four or five plates be exposed, one after the other, in order to trace the history of the explosions from the beginning to the end.

RESPONSIBILITY OF PLATE MAKERS.

To the Editors.

GENTLEMEN,—I have read with much interest the article under the above title in your issue of November 4, and, as I have some knowledge bearing upon the subject, venture to intrude upon your valuable space.

The conditions under which plate makers work in the United States are infinitely more difficult than those known in England; in summer the thermometer often indicates a temperature of 100° Fahr. in the shade for several consecutive days, which, with a naturally dry atmosphere reduces vast areas of the earth's surface and its vegetation to a condition in which the air becomes laden with solid matter, animal, vegetable, and mineral, which if not carefully filtered out before being passed over the undried plates causes no end of trouble. Frequently rapid changes in humidity takes place, sometimes an increase of moisture, without any sensible decrease of heat, and then the difficulties become almost unquarable; vast quantities of ice or expensive refrigerating apparatus is required to cool the entire volume of air used, in many cases a reduction of fully 80° Fahr. being necessary. In my own factory I passed no less than three thousand cubic feet of air per minute through the drying rooms for fifteen consecutive hours daily, and careful examination of the plates with a half-inch microscopic objective proved that they were practically free from surface imperfections.

During the winter months the conditions are quite the reverse: long continued cold freezes the atmosphere from a great portion of its moisture, which is precipitated in the form of snow, germs of all kinds likely to be deposited during drying on the damp gelatine film disappear in a great measure, and the problem of clean and perfect drying is reduced mainly to one condition, viz., a clean air current of uniform temperature controlled by automatic devices preventing any violent fluctuations, and the possibility of freezing the undried emulsion. My usual experience was to thoroughly dry 8 x 10 plates free from "dust" or drying marks in four hours.

I have not alluded to spontaneous changes of uncoated emulsions due to germs embedded in commercial gelatine; any intelligent plate maker must be aware to his cost of this possibility; if not, let him coat a plate with plain gelatin and subject it to continuous gentle heat and moisture, and examine the film with a good one-eighth microscopic objective and tell us what he see.

My present object is to call attention to some other more apparent causes of trouble, and in passing I may cite the experience of the Eastman Company some years since as bearing upon the matter. We found that plates from certain emulsions were giving dissatisfaction to users in different parts of the world, and on examination of our own test plates from the same emulsions confirmed our fears that the plates lacked ordinary keeping qualities. We therefore issued a circular calling in any or all of these emulsions, wherever they might be, and paid out within sixty days no less than 2000!. This illustrates our idea of the responsibility of plate makers. We then obtained sample plates from all reputable makers in Europe and America, and first placed a portion of each in a damp but cool atmosphere, free from deleterious gases, for a period of about sixty days. The films at the time of testing were swollen almost to the proportions of a freshly coated but undried plate, but none showed any signs of fog or other deterioration. Second, slight heat after dampness rapidly injured the films. Third, other portions of perfect plates were placed in clean paper boxes and subjected to a gradually increasing dry heat. I regret that I am not able to give the exact results of each test with its accompanying temperature; suffice it to say, as many characteristics were displayed as there were plates, some being damaged at temperatures far below others, but all finally succumbing in hopeless fog.

Now, I do not communicate the above as evidence of any new characteristics of the materials used in plate making—on the contrary, I have no doubt that most of your readers are only too familiar with such facts; but if we assume that the plates leave the factory in a perfect condition we have only begun the investigation which should follow each and every complaint concerning them. I will not touch upon damage caused by wilful ignoring of manufacturers' instructions concerning development, &c.; that is too wide and fruitful a field for discussion, but certainly the manufacturer should be credited with a fair knowledge of the conditions under which his plates give the best results.

When the Eastman Company introduced their negative paper it was quite natural that extreme caution should be observed in guaranteeing its keeping qualities until experience accumulated, and they, therefore, very properly limited their responsibility to a period of six months, and imposed as a condition that a piece of the defective material, together with the emulsion number, should be forwarded to the Company by the claimant for compensation, which compensation was limited to an equal quantity of good material. The emulsion number was an important requirement, inasmuch as it enabled us to trace the cause of the trouble; but what is the practical outcome of all precautions taken by manufacturers of sensitive films? Let any one take a stroll about town and tell us what he sees in the windows; plates, bromide paper, films, &c.; some brands known to be of excessive sensitiveness, all exposed to the direct rays of the sun under glass. I have one exhibit fresh in mind as I saw it this morning in walking to my office, for there in a show case outside the shop window, and devoted exclusively to the display of plates and sensitive papers, I counted at least fifteen kinds of plates and papers,

some of which I thought looked very much like my own wares. Now, no plate maker should be held responsible for any damage to his goods when exposed in such a manner as above described, and I care not who the dealer is, he should be subject to just suspicion if he is not known to be a careful and intelligent man.—I am, yours, &c.,
WILLIAM H. WALKER,
13, Soho-square, London, W., November 8, 1887.

PHOTO-MICROGRAPHS AT PALL MALL.

To the Editors.

GENTLEMEN,—I have only just seen Mr. Pringle's letter, or I should have replied before, and that if only for one reason, to express my equal astonishment and pain that he should have supposed that I was in the least attempting to meanly depreciate his work.

But is not Mr. Pringle making haste to be offended? I cannot at all see that any expression in my letter can be justly styled as "venting spleen." My only desire was to place the superficial remarks certain papers had passed on my exhibits in juxtaposition with the favourable criticisms passed upon the same work by acknowledged experts, and to perhaps raise a smile at one paper's having passed two such contradictory estimates on the same work. As for "cracking up" myself, why, the very suggestion was such a shock to my modesty that I really believe—if I could only have seen it—my very soul blushed! I confess to having felt disappointed that the results of some years of hard work should be dismissed in influential papers with superficial and therefore damaging criticism. As regards what Mr. Pringle says about my "rare and beautiful objects," if he will turn to page 680 of your issue containing his letter, he will see a most opportune paragraph from "Free Lance" saying just what I did on this point, that this work is only worth doing in the case of the best possible objects; and further, that the best, or even good work, is hardly possible but to those having some training or experience in microscopy. I have been fortunate in acquiring and borrowing many objects really deserving the above title, and I was therefore justly gratified at hearing my efforts to adequately photograph them secure the genuine and critical praise they did from such experts as Dr. Dallinger, Mr. Frank Crisp, and others. "Free Lance" very evidently knows what he is writing about, and I was therefore glad to see from the last sentence of the paragraph already alluded to that he was not inclined to dismiss my exhibit as "commonplace," &c.

I knew Mr. Pringle would be vastly tickled at my suggestion *re* "exquisite decorative designs," but again he is in a hurry to extract the worst possible meaning. I avoided, as I do now, passing any criticism direct or indirect on his work in its scientific aspect, leaving that to able hands; but feeling a measure of truth in the above idea, I could not resist giving a few lines to it, knowing that Mr. Pringle at least would see the humour and grotesquerie of it, but having no suspicion that he would only see a covert detraction in it. At any rate, I think your readers should be grateful to me for giving Mr. Pringle so congenial a text for such "exquisite fooling." I do not think I ever enjoyed an epistle of his more than this one; he has surely "out-Pringled Pringle!"

But seriously, with regard to my doubtless over-bold words *in re* bacteria, my lack of interest in them arises largely from the fact that my study of microscopy has been chiefly from a love of the beautiful and artistic; scientific research is not my forte. If bacteria, like diatoms, had "structure to pay for care in delineation" (I note that Mr. Pringle only quotes, and does not oppose this), I should no doubt have worked at them photographically. My chief aim in photo-micrography is to see how far it can compete with or replace drawing, so as to get more truth to natural effect. I therefore enjoy working at physiological sections, &c., more than at these structureless micro-organisms.

Audacious as I may be to venture a contrary opinion to such scientists as have been quoted, and unscientific as my objections may be, I still feel bound to confess that my lack of interest in bacteria deepens into horror when I review the mad fever of late months for inoculation against rabies—and even as a remedy for consumption!—and lest it should develop into compulsory inoculation against these or other diseases, as with that greatest of disgraceful tyrannies—compulsory vaccination. To my thinking this is nothing short of rank blasphemy against nature; her way is surely to let nothing into the blood but after the most stringent and delicate of testings and siftings. Inoculation and vaccination "trample upon her safeguards and wisdoms," and "mingle in a communism of blood the taints of the whole community every hereditary server opens up into every nursery." (I quote words and thoughts from Dr. Garth Wilkinson's wonderful books, *Human Science and Divine Revelation and The Greater Origins and Issues of Life and Death*). Bacteria are studied mainly, I suppose, in relation to disease, and, therefore, its cure or alleviation; but for this to be of any effectual value, bacteria should be causal of disease, and therefore found in the early stages thereof, whereas it is well known that it is only in the later stages that they are found. Does it not seem, therefore, a "plain fact that they are engendered in each case in the decay made by the disease?" (Dr. G. W.) How then does their study lead to new cures or remedies for diseases? If their study leads to sane methods of cure, I devoutly wish it all progress, but if it breed only the insane methods of inoculation and vaccination, then to my humble thinking such study is fruitless for any physical or spiritual good.

I know that my holding such opinion at once disqualifies me for any argument on purely scientific grounds, but I do not regret this as I firmly believe that no real progress is possible to a de-spiritualised science.—
I am, yours, &c.,
FRED. H. EVANS.

158, Osbaldeston-road, Stamford Hill, November 4, 1887.

A MATTER OF HISTORY.

To the Editors.

GENTLEMEN,—In your issue of the 4th inst. I note these remarks by Mr. W. Jerome Harrison, at p. 698:—"Photography proper now rests, we may say, entirely upon the labours of three great Englishmen—Fox Talbot, calotype process, 1841; Scott Archer, collodion* process, 1851; Dr. R. L. Maddox, gelatino-bromide, 1871." But it appears to me that a most important link is missing, as nearly the whole system of photography to-day is based upon the use of the salts of silver in emulsion, instead of their creation by a double operation, involving a nitrate of silver bath, with all its uncertainties, as was the case with Scott Archer's collodion process, and I venture to believe that all conversant with the history of photography will admit this.

The first practical negative emulsion process was "collodio-bromide," the earliest stages of which were published in your JOURNAL in the autumn of 1864, and the editorial comment (happily the same worthy Editor is still to the front) on that occasion was, that it "solved a problem which had puzzled many and has been felt to be a desideratum." *vide* BRITISH JOURNAL OF PHOTOGRAPHY, September 16, 1864, p. 359.

Gelatine is but another vehicle for the suspension of silver salts, but it has the decided advantages of increase in sensitiveness and absence of volatile solvents.

In the preface to the photographic section of the "Inventories" catalogue, Capt. W. de W. Abney, than whom none is better qualified to speak *ex cathedra* on matters photographic, wrote concerning the discovery of "collodio-bromide," describing it as that "which was to revolutionise the production of negatives," and that "the possibility of doing away with the nitrate bath was a great matter in photography."

The principle of emulsion photography was rendered practical in 1864, but we do not stand still in scientific research, and various modifications and improvements followed, culminating in 1871, seven years later, with Dr. Maddox's adoption of gelatine, which in its turn has evolved further progress, and now we "hark back" on old lines in the use of the roll-holder for the paper support of an emulsion film.

Emulsion carries with it certainty of result with ordinary care, but when the nitrate bath was the *main prop* on which we relied only those who worked then in our art-science can realise the difficulties which at times staggered the veterans of those days. I therefore claim a notice of collodio-bromide in all records of photographic progress, and have no doubt that Dr. Maddox will be as greatly surprised as myself at Mr. Jerome Harrison's omission of its introduction, marking as it did one of the epochs on which "photography proper now rests."

Another should be mentioned, viz., the albumen process pure and simple, which did good work in the decade prior to 1851, and to this day forms an excellent medium for transparent photographs.—I am, yours, &c.,
Redcross Chambers, Liverpool, November 5, 1887. B. J. SAYCE.

A CURIOUS PHENOMENON.

To the Editors.

GENTLEMEN,—A day or two since I had a curious experience, which if not entirely novel is sufficiently interesting, I think, to bear narration. Phosphorescent phenomena in connexion with gelatine emulsions and films have been previously noticed and recorded, but I do not recollect to have seen any account of any inquiry into the conditions that favour such phenomena.

I was developing a gelatino-bromide print, using the same paper, the same developing formula, and, in fact, proceeding in every respect as I have been in the habit of doing for many months past, when upon applying the usual clearing solution of dilute acetic acid, I fancied that a faint phosphorescent light came from the dish; but it was so feeble and transient, that I paid little attention to the matter at the moment. About an hour later a similar thing occurred, though some half-dozen prints had been developed in the meanwhile without any unusual appearance, but this time it was so unmistakable that I commenced to attempt a repetition. My experiments were, however, quite fruitless, and it was not until the following day in the ordinary course of development, I met with the same momentary flash of phosphorescent light, that I got a clue, if not to its cause, at any rate to one of the conditions that favour it.

I was printing from some very thin negatives with large masses of nearly transparent shadows, and in order to get contrast without spoiling the lights, I had to expose long to a feeble light and use a powerfully restrained developer. Under these circumstances I am able to reproduce the phenomena at will, but am wholly at a loss to explain the reason why they appear only after a long exposure.

The developer was the Eastman soda formula, and the clearing solution dilute acetic acid about one in sixty, applied immediately after develop-

* i.e. with a nitrate bath.—B. J. S.

ment and before washing. Perhaps some of your readers may have met with a similar experience, and may be able to throw further light on the cause. At any rate it may interest you to publish the facts.—I am, yours, &c.,
B. W.

ORTHOCHROMATIC PHOTOGRAPHY.

To the Editors.

GENTLEMEN,—On the occasion of Mr. Wellington reading his paper on *Orthochromatic Photography* at the Photographic Club, the question was raised during the discussion which followed, as to whether the use of orthochromatic plates was legitimate or not, the reason being, that in many cases the cracks in the original did not show in the copy; also, that the copy was much brighter than it should be, considering the state of the original. Consequently the impression was conveyed that the photograph, instead of being made from the original, was really taken from a freshly painted duplicate. Certainly this appeared to be the case with one or two examples shown at the meeting. The same kind of thing appears to me to exist also in the copies of the pictures in the National Gallery, published by Braun & Co., also in those in the present Photographic Exhibition. Must we not consider that these copies are all untruthful?—I am, yours, &c.,

ONE WHO WAS PRESENT AT THE MEETING.

THE MERCHANDISE MARKS ACT.

To the Editors.

GENTLEMEN,—I notice in your issue of to-day (November 4) a letter upon the above. I would like to ask a question or two that I think may be of interest and importance to your readers. The case is very simple. An amateur engaged in another calling, that being his legitimate means of income, takes a set of negatives of interesting subjects. He brings them to me, and liking them I purchase them of him at so much a-piece. In publishing copies from these negatives, as I did not produce them, am I compelled by the Act to affix his name as the artist to every copy, because under Clause 2 I cannot say "photographed and published by my firm," because that is false, and under Clause 3, second section, if I stamp them as other goods, I reasonably lead persons to believe that the goods are the manufacture or manufacture of my own firm, when they really are the manufacture and merchandise of another. Which, therefore, would you designate him, as he makes a profit by his work?

Lastly, if I employ a gentleman who poses as an amateur to make lantern slides for me for sale, and I pay him his charge for same, does this Merchandise Marks Act apply, and is he an amateur or a professional?—I am, yours, &c.,
HARDING WARNER.

The Hollies, Clyde Park, Clifton, Bristol, November 4, 1887.

To the Editors.

GENTLEMEN,—In my letter of the 1st instant, inserted in your last week's number, I gave a few extracts from the above Act, and alluded to its possible application to the photographic lens trade. I will now endeavour to show how, in my opinion, it does so apply.

It is pretty generally known that the *bonâ fide* makers of photographic lenses in this country are very limited in number, the following names probably including most, if not all—Grubb, Ross, Dallmeyer, Wray, Swift, Beck, Taylor, Burr—whereas the *sellers* of lenses with their own names attached may be reckoned by scores. Provided the lenses thus sold are manufactured abroad, and do not bear a mark indicative of their origin, it is an offence punishable under this Act, for a person in this country to attach his name or trade-mark or trade description, and sell or expose for sale, or use for the purposes of trade or manufacture, any lens so imported and marked; the penalties under this Act being perhaps rather severe. An offence as above renders the offender *on conviction on indictment* liable to imprisonment with or without hard labour for a term not exceeding two years, or to both imprisonment and fine; or *on summary conviction* to imprisonment, with or without hard labour, not exceeding four months, or to fine not exceeding 20*l.*, or on a second conviction to six months and 50*l.*

Even if a person innocently purchases a foreign manufactured lens with false trade-mark or trade description, and subsequently sells or offers for sale, or has in his possession for purposes of trade, any such lens, he renders himself liable to these penalties. For the future it will not only be *caveat emptor*, but rather "let the seller beware."
C. W.

November 8, 1887.

RED TAPE.

To the Editors.

GENTLEMEN,—A short time since I entered a well-known photographic shop and asked for six ounces of carbonate of soda, which were weighed out and handed to me, when the following conversation took place:—

Buyer.—"How much?"

Seller.—"A shilling."

B.—"That seems very dear; how much is it by the pound?"

S.—"Eightpence a pound; twopence an ounce."

B.—“Can't you sell less than a pound at the rate of eighteenpence a-pound?”

S.—“Yes, you can have half a pound for ninepence.”

B.—“So you charge a shilling for six ounces, while you give eight ounces for ninepence; doesn't that seem very absurd?”

S.—“Can't help it, that's our rule.”

B.—“Now look here—I don't want eight ounces, I want six—I'll give you ninepence for the six.”

S.—“No, can't take it; can't break our rule.”

B.—“Well, if you give me two ounces more that will make half a pound, and you can charge me ninepence.”

S.—“Yes, we can do that.”

B.—“All right, give me two ounces more.”

Which was done; the extra two ounces were weighed out and put up in a separate parcel, and I paid ninepence for the eight ounces. As has been remarked before, “Comment is needless.”—I am, yours, &c.,

A.M.

Exchange Column.

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

I will exchange enlarging apparatus for first-class studio furniture.—Address, W. DAKIN, 1, High-street, Sheffield.

Will exchange whole-plate view lens for magic lantern suitable for enlarging.—Address, J. LILLIE, Fortes, N.B.

Wanted, whole-plate tourist's camera; will give in exchange photographic books.—Write for particulars to EDWARD J. HUGHES, Graigue, Co. Kilkenny.

Wanted, tourist's 10x8 set in exchange for 12x10 folding camera (little used) and Ross' whole-plate portrait lens.—Address, ASH, 44, Hampton-street, Walworth-road, S.E.

Will exchange a carts lens by Cox, or a cabinet lens by Voigtländer, for a pair of twin stereoscopic lenses. Difference adjusted.—Address, CHARLES WHITING, 370, Uxbridge-road, London, W.

Exchange, a fifty-four-inch Coventry Special bicycle, balls throughout, and all latest improvements, for a 9x7 or 10x8 long-extending camera and symmetrical lens.—Address, J. ATKINSON, Photographer, Wokington.

Wanted, pair of stereoscopic two-and-a-half or three-inch Dallmeyer's portable rectilinear lenses; give in exchange other lenses, quarter-plate camera, &c.—Address, 17, Grosvenor-square, As-ton-ou-Mersey.

Will exchange an Ottewill's changing box for eighteen plates, 8x6, dark slide, and all complete, good condition, for tripod, sliding legs, or metal dark slides (Taylor's whole-plate preferred).—Address, A. E. BANNISTER, 31, Clifford-street, Southampton.

Rifle, revolver, trout rod, complete, box of Newman's dry colours, silver lover (English), Lerebour half-plate portrait lens, and large medical coil, in exchange for modern studio camera, whole-plate field camera and rapid rectilinear lens, backgrounds, and rapid shutter.—Address, R. H. THOMAS, The Ithine Studio, Youghal.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as “Constant Reader,” “Subscriber,” &c., should be avoided. Correspondents not conforming to this rule will therefore understand this reason for the omission of their communications.

A. HAMILTON (Bristol).—Thanks.

G. F.—Imperfect fixation is the cause of the marking.

ELIMINATOR (Northampton).—The address is, Scovill Company, 423, Broome-street, New York.

J. HETHERINGTON.—Having the negative no other apparatus is required beyond that described.

CRYSTAL.—Consult our advertising columns. Every manufacturing optician supplies lenses wholesale.

W. ELSDON.—The intensifier with cyanide of silver given on page 241 of the ALMANAC, 1883, is practically the same. It will answer the same purpose.

J. W. MAHKS (Bowes Park).—You will find an article on the subject on page 456 of our volume for 1882. The Platinotype Company will supply you with the article.

C. MORLAND.—For the early history of photography consult Hunt's *Manual of Photography*. For your question as to the history of the gelatino-bromide process, see our ALMANAC for 1880.

J. R.—The fault is not with the paper, or with the toning bath; it is simply imperfect fixation. Either the bath is too weak, the time of immersion too short, or the prints are allowed to stick together while in the solution.

R. G. C.—Undoubtedly you can get the effect desired by employing the proper combination of lenses, but we cannot give you information as to anyone who will carry it into execution. You will have to conduct the experiments for yourself.

PERPLEXED SUBSCRIBER (Monkwearmouth).—You will not get good portraits in your studio as it is; they will always be hard and flat. The best plan will be to block out the light at B entirely, and put the background there. Then stop up two-thirds of A at the B end, and put in glass up to the end of C or a little further, stopping out all the light from the side window facing A. The light C might also be enlarged somewhat, say twelve inches each end.

STANLEY ROBERTS.—The best plan of getting a “practical knowledge of lighting” is to take some lessons from a practical photographer who is well versed in the subject. Write the title on the negative with a sable pencil charged with black varnish. It will then print white in the print.

A. G. FIELD.—1. There is no such work published. Many articles on the subject have appeared in our back volumes, also in the ALMANACS.—2. Seavey's backgrounds may be obtained through any of the large dealers. Try Mr. Atkinson, of Liverpool, or Messrs. Marion & Co., Soho-square.

R. J. HOLCROW.—Any person possessed of a passion for printing on wood, fulfilling the conditions required by you, would not care to part with the information under a very heavy amount. We have heard of very large sums having been paid for tuition in this branch, but the method taught did not come up to your estimate of what is necessary.

X. Y. Z. asks: “Would the addition of soda carbonate to the fixing bath answer as well as liquid ammonia? My printer is not very strong, and finds ammonia fumes very trying, so should be very glad to discard its use if not detrimental to the pictures.”—Carbonate of soda will render the solution alkaline as well as ammonia, and, for all practical purposes, it will answer.

A. B. M.—1. No.—2. Strength, four ounces to the pint of water. The time will depend upon the make of plate. Leave them in the bath until they are clean, and for some little time after.—3. The same strength will do for prints. Let them be immersed with constant movement for fifteen minutes.—4. Until the whole of the hyposulphite of soda is illuminated.—5. The ultimate ruin of the negative.

A. F. M.—The sketch shows the studio to be a very good one. Fit curtains at the sides, so that they can be moved laterally; and blinds at the top working up and down. Place the sitter at the south end, and the camera at the other. The sitter can then be illuminated either by the east or west light as the time of day may determine. With this arrangement of blinds no papering up of the glass will be required.

B. West writes: “Will you kindly state how silver prints are burnished? I have Burton and Hepworth's Handbooks, but neither of them give the method of procedure. I had some fairly good pictures but have spoilt some of them in trying to burnish them.”—In the first place, lubricate the prints by rubbing over the surface with a piece of soft flannel moistened with a solution of one grain of Castile soap in one ounce of methylated alcohol. Then heat the bar of the burnisher as hot as the hand can well bear it or a little hotter, and pass the prints two or three times through the machine, sufficient pressure being arranged to produce the desired gloss.

F. A. C. writes: “1. You advocate washing prints with a squeegee; will you kindly tell me the method and how long it takes, and whether it is really better than the prolonged ordinary washing?—2. Can you tell me where I would be likely to get papier-maché in stout sheets? I want it to build a camera with, and it strikes me it would be capital stuff—light, stiff, and not likely to warp in India, but I have found a difficulty in getting any.”—In reply: 1. An article on the subject of washing large pictures in which the squeegee is utilised will be found in the number for January 7. The plan there advocated involves more labour than simply soaking the prints in water, but it is more efficacious.—2. We expect the flat sheets of papier-maché will have to be made to your order. Any manufacturer will, we surmise, make them for you.

* * With this number we give an engraving of Mr. H. P. Robinson's medal picture, *Curalling*.

On our editorial table, and soon to be transferred to the wall of the *sanctum*, is a large and fine photograph, said to be a good likeness, of the President of the North London Photographic Society, printed in platinotype by Mr. James Martin, of New Southgate, from a negative taken by Mr. John Stuart, of Glasgow. It is mounted on an Indian tint and makes a nice and effective picture.

MR. W. S. BIRD, the Honorary Treasurer of the Photographic Society of Great Britain, being about to sail for Australia for the benefit of his health, was entertained at dinner in the Holborn Restaurant on Saturday evening last by about thirty of the leading Metropolitan members of that Society, Mr. James Glaisher, F.R.S., President, occupying the chair. A pleasant evening was spent, and many wishes expressed for the speedy restoration of the health of the departing guest, whose absence from this country will probably extend to eight or nine months.

PRESENTATION.—At the Smoking Concert of the Camera Club on Monday evening last, occasion was taken to recognise the invaluable services rendered to the Club by Mr. G. Davison, the Honorary Secretary. In name of a large body of the members Mr. F. Machel Smith, who presided, after recounting what Mr. Davison had done to further their interests, presented that gentleman with an ornate gilt clock and a purse of sixty guineas. Mr. Davison made suitable reply. What with the “feast of reason, the flow of soul,” and the fragrant clouds from the *Nicotiana Tobacum*, a pleasant evening was spent.

THE JENKINS'S FUND.—Dr. Maddox (Greenbank, Park-road, Portswood, Southampton) desires to acknowledge the following sums:—Frederick York, Esq., 3*l.*; A Friend, 1*l.*; W. M. A., 2*s.* 6*d.*

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1437. VOL. XXXIV.—NOVEMBER 18, 1887.

PHOSPHORESCENCE IN THE DARK ROOM.

A LETTER in our correspondence column of last week once more calls attention to a matter that has cropped up on more than one previous occasion, namely, the manifestation of phosphorescent phenomena in connexion with photographic operations. But as our correspondent suggests, no systematic attempt has hitherto been made to investigate or explain such occurrences. It will be remembered that Mr. W. K. Burton, a year or two ago, directed attention to similar phenomena produced in stirring an emulsion, and more recently the production of phosphorescent light under conditions practically identical with those now recorded were reported in the journals.

A tendency has been shown to discredit these alleged manifestations as mere illusions, at least on the part of some experimentalists who have failed in their attempts to reproduce them; but we are in a position to say that the statements are fully justified, and to show how the results may be produced with as much certainty as the development of a photographic image. As to any explanation of the causes, we can say but little beyond that they are purely chemical, and in no sense photographic, inasmuch as they can be produced in the dark room without the assistance of light or the interference of any photographic film or other material sensitive to light in the ordinary sense.

Only a fortnight ago we published a letter from Mr. F. E. Ives, of Philadelphia, combating the conclusions arrived at by Mr. D. Winstanley with regard to the possibility of photographic action being set up in the dark upon photographically sensitive films by the invisible phosphorescence of otherwise inert substances. But the question we have to discuss is one altogether different, and relates merely to visible phosphorescence produced without any but chemical action. Phosphorescence produced by exposure to light is a phenomenon well known in connexion with certain substances, notably phosphorus, from which the term is derived, and many of the sulphides, the most familiar to the photographer being the sulphide of calcium which forms the basis of Warnerke's "luminous tablet" and Balmain's paint. It is not, however, so generally known that nearly all substances in nature possess the property to a certain extent, though it is so feeble and lasts so brief a period as to be invisible under ordinary conditions. Becquerel, however, has shown such to be the case, and he devised an instrument by means of which the phosphorescent properties on exposure to light of hitherto unsuspected substances was demonstrated.

Other substances, again, exhibit phosphorescent properties when submitted to friction or percussion. Loaf sugar, for

instance, if bruised, or pounded, or rubbed in the dark, displays this characteristic, and a very beautiful effect is shown by shaking a bottle containing dry crystals of uranium nitrate under similar conditions. These manifestations, however, may be classed rather as electrical than chemical, while the phenomenon mentioned in our correspondence column would seem to be purely chemical, if indeed a fine line can be drawn between electrical and chemical reactions.

In our correspondent's case an exposure has been made to light, and from his letter he evidently, and perhaps naturally, attributes the subsequent phosphorescent appearance to that action, as it was only after a long exposure that the transient flash of light occurred. But we shall show that the exposure to light is unnecessary, and that the chemical conditions of development alone produced the manifestations when they did occur.

Our first experiments were made in this direction some months ago under somewhat similar conditions to those detailed by "B. W.," but we have, since reading his letter, repeated and extended them. It was in connexion with paper negatives, we may remark, that we first noticed the phosphorescent appearances, and this has been the case with several observers, more than one of whom for that reason have attributed it to some peculiar property of the paper support. This, again, we shall show to be quite erroneous, as the phosphorescence is as readily produced with glass negatives as with paper, and as readily without either. The only reason why paper negatives and positives enjoy almost the monopoly of this property is because it is only with paper films that the clearing solution is applied *before washing away the developer*. We are extremely sorry to demolish any carefully elaborated theories on the subject of the phosphorescence of white paper, but there lies the sole explanation.

It is, in fact, the mixture of the *acid* clearing solution with the developer that excites a momentary phosphorescence lasting sometimes perhaps a second or more, and, under favourable circumstances, so vivid as to resemble a moderately excited tablet of Balmain's paint. As we have said, the glass or paper negative has no part whatever in the performance, all that is necessary being a developing dish and developing and clearing solutions.

And now a word as to the active agent in this matter. We have to deal with pyrogallol, in combination with which we always employ sulphite of soda, alkali, bromide of potassium, or other alkaline bromide, and a free acid. Pyro alone, when mixed with the acid, has given us no sign of the occurrence, while pyro and alkali, or pyro and bromide alone, are almost equally free from any susceptibility. But when the three

are present simultaneously, the manifestations commence, and it is interesting to note that the degree of phosphorescence appears to depend entirely upon the proportion of bromide present. Thus, though the other two ingredients of the developer are absolutely necessary to the production of any sign of luminosity, variations in their strength produce little or no apparent effect on the result; whereas, in proportion as the quantity of soluble bromide is increased, so the luminosity acquires greater strength.

The effect varies with the character of the clearing solution used, or, more accurately speaking, with the acid; an organic acid, so far as our experience goes, being indispensable. Nitric, hydrochloric, and sulphuric acids have given negative results under all conditions, while acetic, citric, oxalic, and tartaric all produce phosphorescence, the first named most vividly.

The experiment is easily performed. In one developing glass mix solutions of pyro and of alkali in the proportions usual in development. We are not aware that the nature of the alkali matters. We have obtained the result with both soda and ammonia, though the former is what we have usually employed from convenience. In another glass mix a solution of acetic acid, say, one drachm of the glacial acid in six or eight ounces of water. Now pour the alkaline pyro, or developing solution, into a clean dish, and after allowing it to flood the bottom and sides, return it to its glass, and pour into the dish the dilute acid. Most probably not the faintest sign of any luminosity will be visible, though we have on occasions fancied we could detect a faint glimmer, but have never been able to distinctly affirm such to be the case in the absence of bromide.

Now rinse out the dish, and having added to the developing solution a drop or two of sixty-grain bromide solution, repeat the operation of flooding the dish, and again return the developer to its glass. Upon now pouring the acid solution into the dish, a distinct phosphorescence, varying with the quantity of bromide used, will present itself. If the quantity of bromide is but small, there will be a momentary and faint flash, chiefly visible on the corners and along the angles of the dish, while, as the strength of the bromide is increased, it gradually spreads over the whole surface, and acquires greater brilliancy, until, with a large proportion of bromide, the contents of the dish assume for a second or more a most beautiful appearance of liquid fire. The same quantities of solution may be used over and over again, and if the quantity of bromide be gradually increased, the corresponding growth in brilliancy can be noted. When the solutions are mixed, a bright flash of light occurs, and then all further action is destroyed.

Now, to vary the experiment, and show how a photographic film *may* take part in the reaction, though only chemically, we will proceed, with pyro and carbonate of soda alone, to develop a positive, and afterwards treat it with the same acid solution. We will purposely select a negative to print from which possesses but little heavy shadow and no violent contrasts, and let the exposure be so timed that the development is not forced. In fact we will endeavour to produce a soft picture devoid of heavy deposits in any portion. Upon development being completed, pour the solution into a glass, and keep for further use, and without washing treat the print with the clearing solution. The chances are that no result will accrue, or, if there should be any luminosity, it will be so faint as to have escaped notice entirely, unless carefully watched for. But now proceed to develop a second picture with the same quantity of solution, and a third, and it will be found that

each successive one exhibits a stronger phosphorescence than its predecessor upon applying the clearing solution.

The explanation of this is extremely simple. The first time the solution was used it contained no soluble bromide to commence with, and the quantity acquired from the reduced bromide of silver in the film was, under the circumstances, comparatively small, hence the negative result. But on each successive development the quantity of bromine liberated and retained in solution is increased, and consequently the conditions improved for the production of luminosity. This, again, explains why our correspondent only occasionally meets with the experience. We imagine that, as a rule, he employs simply the solutions of pyro and sulphite and of carbonate of soda which comprise the formula he mentions. Under such circumstances he is practically carrying out our experiment above; but, under the exceptional conditions he quotes, not only does he resort to bromide as a restrainer, but he also liberates a large proportion of bromine from the films themselves, and thus brings about the very requirements of the case.

Whatever may be the chemical explanation of this phenomenon, it is clear from what we have said that it is entirely distinct from any photographic action, and is equally free from any influence of light or of silver salts. Our own view is that the phenomenon is entirely due to the action of the acid upon a compound of pyro and bromine, which are known to enter into combinations which exhibit peculiar properties of fluorescence. However that may be, we regret, as we have said, to have to destroy the picturesque theories that might have been woven round the subject. But there is no surmounting hard facts, and all that can be said as to the connexion of photographic action with the phosphorescent manifestation is that *it does not interfere with it*.

A PHASE OF ORTHOCHROMATIC PHOTOGRAPHY.

IN a letter which appeared in our last issue an important point, in one sense, is touched upon in connexion with orthochromatic photography. It appears that in the discussion following on the reading of Mr. J. B. B. Wellington's paper on this subject at the Photographic Club, the question was raised as to whether photography when employed orthochromatically does truthfully render an oil painting—say, the work of one of the old masters which has suffered somewhat at the hand of time.

We know quite well that when an old oil painting, in which the colours themselves and the varnish have become dingy, yellow, and cracked, is copied in the ordinary way by photography, the result, as a rule, is far from satisfactory. The colours, as seen by the eye, particularly if the yellows and blues predominate, are very incorrectly rendered, and the fissures in the varnish and pigment are very strongly pronounced, however skilfully the lighting of the original may be accomplished and the other portion of the work executed. We have ample evidence, on the other hand, in the examples which have from time to time been shown where orthochromatic plates and the coloured screen have been used, that with the same picture under similar conditions of lighting, not only are the colours of the painting more discriminatively rendered but that the defects due to age—the crack, for example, and the yellowing of the vehicle and varnish—are far less prominently reproduced. In a word, orthochromatic photography seems to have the happy property of ignoring, to a great extent, the worst features in an old painting which has suffered by time, while

ordinary photography appears to exaggerate them in a marked degree. Which is correct?

There is no question that if cracks exist in the original they should show in the copy, that is if mechanical accuracy be the main point in view; and unless they do, as has been pointed out, it is quite possible that the idea may arise in some minds that the copy was not made from the original painting but from a modern replica. At one time many persons imagined that the excellence of the work issued by certain Continental houses was due either to the negatives being taken from copies of the paintings, or that they were most elaborately retouched. Sufficient, however, has been demonstrated during the past year or two to prove that it need not have been due to either if orthochromatic photography were employed.

If it be necessary, in order to convey a correct idea of the original, that the fissures in all their details should be shown, and all the defects arising from age reproduced, then orthochromatic photography would certainly seem to be out of place, simply because it ameliorates them to a great extent. But is it essential to do this? Is it far more desirable to render the painting in the photograph as nearly as possible as it was when it left the artist's easel? Discoloured varnish and cracked pigment add nothing to the beauty of a painting or to its value, except, perhaps, in the neighbourhood of Wardour-street. This being the case, why should they be reproduced in a photographic copy when it can be avoided? It is partly through these defects being so much subdued in the recent productions of Messrs. Braun & Co. from our own and the Continental galleries, that the reputation of this firm as copyists of works of art has been so much enhanced. Few, we imagine, will be inclined to question the fidelity of their reproductions of the pictures in the National Gallery, simply because of the unpleasant rugosities seen in previous copies being so much subdued.

Suppose an engraver were commissioned to engrave a plate from the work of one of the old masters which had suffered from age, would he reproduce the cracks and convey in his work the idea that the brilliancy of the colours had to a great extent been subdued by the discolouration of the varnish. Certainly not; nor would the fidelity of his work be questioned on that account. If this be so, why should the efficiency of orthochromatic photography be called in question, particularly as it does not entirely ignore the ravages of time, which an engraver would do, but only somewhat subdues them?

The object of the engraver when he reproduces an old master is not to represent it in its cracked and faded condition, but as nearly as possible as it was when it left the artist's hands. This being the case, why should not the object of photography orthochromatic or otherwise, be in all respects similar?

CHRISTMAS cards formed the subject of two lawsuits in the High Court of Justice last week. In both it was on the question of copy right. In the first case, one firm of publishers sued another firm for infringement of copyright, praying for an injunction restraining further publication, damages, penalties, &c. The pictures in question were illustrations in children's books, and the alleged infringements were reproductions of these, issued as Christmas and New Year's cards. The defence to the action was, that the copies were purchased from a firm carrying on business in Germany, and that the defendants were not aware that the pictures were an infringement of any copyright. In the end the jury awarded the plaintiffs three hundred pounds as damages, and for this amount the judge gave judgment, and also ordered all the piracies to be destroyed

He, however, stayed judgment on payment of four hundred pounds into Court within a week.

In the second case an important point in connexion with photographic copyright was in question. A motion was made in the Chancery Division by the plaintiff to restrain the defendants, Messrs. Tuck & Sons, from reproducing and selling copies of a photograph which he had registered. It appears that some two years back the plaintiff's two children were photographed by an operator in the employ of Mr. Goodman, of Margate. From the report of the case it appears that *cartes* were taken in the first instance, and, subsequently, six cabinets at a reduced price on consideration of an extra one being taken for the photographer's own purpose. Mr. Tuck purchased from Mr. Goodman a copy of the cabinet picture, and proceeded to make copies, which are now being sold as Christmas and New Year's cards. On this coming to the knowledge of the plaintiff he proceeded to make the picture copyright, and, ultimately, a writ was issued. The defence raised was that the plaintiff had not complied with the Act; and, further, that there was a contract by which the negative, in consideration of the reduced price at which the picture was taken, became the property of Mr. Goodman, who, therefore, had the right to sell it to Mr. Tuck. In the end the judge ruled that the plaintiff had not complied with the provisions of the Registration Act; adding, that according to the authority laid down in the case of *Nottage v. Jackson* the copyright in the negative was the property of the artist who arranged the instrument and posed the objects to be photographed, unless a special agreement was made to the contrary. He refused the injunction asked for.

From the above decision it is apparent that the sitter has no copyright in his own portrait, as it belongs to the one who arranges the camera and poses him. Now, in some first-class establishments the proprietor makes it a rule to pose the sitter and arrange the lighting himself, while an assistant focuses and exposes the plate, and, subsequently, develops and finishes it. In such a case as this in whom is the copyright in the picture vested? Evidently it is not in the sitter. Can it be in the one who poses and lights him? Or is it the property of the assistant who focuses the image, exposes, and afterwards develops the plate? It is the latter who actually makes the negative. There is no denying that the copyright question, as regards photography, is indeed a vexed one, and the sooner the present law is amended, or a new one passed, the more satisfactory it will be for all concerned.

A FEW weeks back we alluded to the fact that *carte* and cabinet portraits of actors and actresses, printed on opal glass by the carbon process, were now being sold at the same price as those on paper. Now, the question naturally arises in many minds, What will the purchasers do with them? Paper pictures are, of course, put into albums, but glass ones cannot be. Will they be put into miniature frames and hung upon the walls? or on fancy stands and stood about on whatnots and the like? If so, a collection of portraits of celebrities on glass, such as some persons possess on paper, will soon become little less than a nuisance in the house, particularly to the housemaid who has to keep them clean. If these pictures become popular some convenient means will have to be devised for their preservation.

WHAT has just been said with reference to glass portraits applies to other small pictures on opal. During the past few years there has been a rage, and it appears to be increasing, for pictures on opal as Christmas and New Year's "cards." Usually these are sent out fixed on a small stand, or in a neat frame. But clearly there is a limit to the disposal of them even in this form. In some families Christmas cards are received through the post by the dozen, and most people like to keep them as a memento. If they are on paper they can be placed in albums, and mounted in scrap-book, or put into fancy trays or baskets, hence a large collection may be kept in a compact form. But if the "cards" are on glass what can be done with them? They cannot be mounted in albums. On the little stands they will accumulate dust and, by continual wiping, will

quickly become dirty and spoilt. If they are placed in trays it is manifest they will soon get scratched by contact with one another—or broken. If they are framed what can be done with them if the number be large? If opal glass is to take the place of paper for portraits of celebrities, and for complimentary cards, the fortunate recipients may find an accumulation of them something like a "white elephant," unless some means are devised for keeping the collection as compact as in the case of cards. Here is a hint to manufacturers.

ECHOES FROM THE SOCIETIES.

PROFESSOR STEBBING'S experience of photographic dark rooms must have been singularly unfortunate, if I may judge from his remarks on the subject during a discussion at the London and Provincial Photographic Association. Markings are caused upon collodion emulsion plates, he says, when coating in a damp room, "from the rapid evaporation of the ether and alcohol, and the condensation on the film of the damp atmosphere." Certainly, if Professor Stebbing's laboratory is adjacent to the back kitchen when the family washing is being done I could quite understand such a result, but otherwise not. The rapid evaporation of the ether and alcohol requires a dry and warm, not a moist, atmosphere. The Professor's explanation of a not-unknown fault seems to me an erroneous one. Given an emulsion made with weak solvents, or overcharged with water on sensitising, the result mentioned by him is just what would ensue—the ether and alcohol evaporate, leaving the less volatile water mixed with a portion of alcohol, in the form of dew on the surface of the film. It would, indeed, have to be a moisture-laden atmosphere that would deposit its water so rapidly and copiously upon a plate, even when we take into consideration the lowering of the temperature of the latter from evaporation.

Mr. Adeock is an enthusiast in art photography, and has done much good work in the department he has made his own; but I scarcely think he will obtain a large following of amateurs who will be willing to give up "rustic scene-hunting" for the "beauties and opportunities" of the London streets. "Slumming" promised to become a popular pastime a short time ago, but it soon died out; there was more realism than beauty to be met with, and the aristocratic mind and eye were not educated to separate the artistic from the merely repulsive. Besides, the pursuit was surrounded and accompanied by troubles and inconveniences that the fashionable mind turned against. It was all very well talking on the subject in the drawing-room, but when it came to real "slumming" it was *rather* different. So it is all very well talking and writing about street photography, but when it comes to the actual "unlimbering" in a crowded thoroughfare the amusement at once assumes a different complexion. The "chaff" alluded to by Mr. Sage in the Camera Club discussion is one of the least of troubles—in fact some individuals are blest with such thick skins as to be perfectly impervious to it. I confess I am not, and under no circumstances that I am acquainted with does chaff appear so pungent, and telling, and soul-annihilating, as when you *know* you are causing an obstruction with your camera.

I remember on one occasion I formed the perspiring centre of a not inconsiderable crowd, having foolishly, as I then felt, taken a fancy to photograph one of the old and fast-disappearing landmarks of London. I had managed to get on fairly well by keeping my temper and pretending I really enjoyed the fun, and I was bidding my time till the crowd should get tired and clear off. Futile hope! I had stood a vast amount of mild chaff, and replied to the best of my power in a friendly way, but I was quite taken off my guard, and in fact "knocked into a heap," by a confidential question, scarcely asked in a whisper, just behind me—"Jim, ain't that the bloke as 'sneaked' th' other cove's picture-box at Hampstead that Sunday? I believe it is." I don't know whether it was the unmistakable earnestness of the tone—whether real or assumed—or the suggested "dirtiness" of the trick in robbing a "pal" of his means of livelihood, but I winced and did not reply. After the lapse of a few seconds the same voice in a louder tone and with evident satisfaction, continued: "I know'd it was! See him colouring? The bloke heard me!" Then I turned round and I am afraid used bad language, and it was all up with my photographing. I had eventually to beat a most ignominious

retreat, attended by a crowd and followed for some distance by a policeman, who was evidently uncertain in his mind whether he ought not to arrest me as a suspicious character. That was my last attempt at street photography, and, as I feel at present, will continue so.

But returning to Mr. Adeock's address. I think he underrates the difficulties, as well as overestimates the artistic value, of the subjects to be derived from the streets. How often is it as we pass along that we meet with a composition that is really suitable for a camera reproduction? I am not speaking of large masses or crowds, or even of extensive groupings—these are never either "artistic" nor capable of perfect rendering—but of simple figures, or combinations, or incidents, such as the painter selects for his subjects. I venture to say that in a day's journeying Mr. Adeock will not find one of which he could honestly say, "That will do."

I quite agree with Mr. Adeock that vulgarity and repulsiveness are not necessary adjuncts to pictures of low life; quite the contrary, for some of the most pathetic and truly refined ideas have been clothed in the homeliest garb. But where the photographer labours at a disadvantage is in depriving the subject, if not exactly of its vulgarity, at least of its repulsiveness or "commonplaceness." Say what we will of the beauty, the artistic and the dramatic effects to be found in humble life, idealise such subjects as we will, it would be folly to attempt to clothe the fact that to the camera they are inexpressibly ugly, and too frequently, also, vulgar. Examine all the best photographs of the class, and I think it will be found that wherever the subjects are *bonâ fide* "low-life" characters, they fail to make pictures, though as photographs they may be perfect. I am speaking, mind, of the class of work Mr. Adeock refers to, namely, quick shots in the streets or alleys of our large towns, and where the subjects are equally unpolished in mind and physique. Of course, when an educated and refined model is chosen, and "levelled down" to the low-life standard and made to masquerade in a false character, we gain the beauty and finish that can be imparted to a "paste" imitation, but the real-gem truth is absent.

Take the class of subjects for which such painters as Luke Fildes are known. In almost every instance the sentiment of the picture turns upon the expression, it may be of the whole face or of a single feature, or it may be the gesture or pressure of a hand. Not only that, the natural "vulgarity" or repulsiveness must be smoothed away in order to leave as much beauty as can be got into the picture without destroying its truth. The mere posing of a few figures with a "property" or two thrown in will not answer, the figures must belong to the picture and seem as if they knew they did. How can the photographer attain this without educating his model? And if he succeeds in doing that the model becomes something he or she was not before.

Look at a picture I have in my mind's eye as I write—*A Sermon in Charity* I think it is called. A child, a dog, and a doorstep are all it consists of, yet it speaks as no photograph of the sort ever spoke, simply because the artist is supreme. The expressions of both child and dog are perfectly natural because they are what we can *imagine* as natural. But how could the photographer call them up for the occasion? I fancy if he tried to do a *Sermon in Charity* on the same lines in some of the slums of Seven Dials or Clare Market, his little girl would be enjoying a game of hopscotch along with her bread and butter, while the dog, if he were not "chevying" some cat not belonging to his street, would most probably be lying asleep, either of which occupations his experience would tell him were less disappointing than begging for bits of bread the local children were too hungry themselves to spare. The artist's conception is none the less natural on account of its improbability, but while it is possible to him it is beyond the power of the photographer. MONITOR.

IODINE AND SODIUM HYPOSULPHITE.

SOME little time back a question was asked with regard to the efficacy of iodine as an eliminator of hypo from prints, and as none of the members present had apparently any experience with, or knowledge of, the combination, a few lines on the subject may be useful, as warning photographers of the worse than broken reed they trust to in using iodine for the purpose.

The method as I take it from the report, consists simply in soaking the prints in a dilute solution of iodine, which at once turns them deep blue from formation of iodide of starch, and afterwards washing in water until the colour is discharged, when the hypo also is presumed to be removed. The appearance of the prints so treated cannot, I should think, be very encouraging, which is perhaps the reason why the "process" remains unknown, although it was published and passed without comment in a contemporary some few years back.

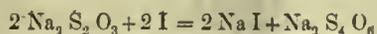
Our old friend hypo has acquired such a bad name that it is not surprising there should be a demand for "eliminators," many of which have been put forward, but I hold that, even granting the desirability of using such substitutes for fair washing, the first condition should be that the substance chosen, be it what it may, converts the hypo into something innocuous, or, at least, less injurious than itself. Of the more usually employed eliminators, alum has been proved to be dangerous on account of the decomposition products it leaves behind it, while the hypochlorites and hydroxyl, though less dangerous in that respect, possess other disadvantages which necessitate their use with the greatest caution.

Iodine, however, appears to be more objectionable in every way than any of the substances named. In the first place, its discolouring action upon the sizing material of the paper is scarcely a recommendation in its favour, except in so far as it compels the most careful operator to give a certain amount of washing in order to restore the print to a presentable appearance. But, however carefully this washing may be performed, it is scarcely possible to conceive that the whites of the picture are not to some extent degraded. Add to this that the iodine has a direct and powerful action upon the silver forming the image and we have another reason for looking upon it with suspicion. Even granting then that the hypo has been perfectly removed by washing, and that the iodine is only used as a final safeguard, it presents features which render its use inadvisable, to say the least.

But if we turn to its chemical reactions with hypo, its employment as an eliminator or destroyer of that salt is to be viewed with still greater suspicion. Destroyer, here, is scarcely the correct term, for though the hypo no longer exists as such, it becomes converted into a substance which is hypo plus sulphur and a compound of perhaps as unstable a character as itself. The new compound is tetrathionate of sodium, a combination of sodium with one of a series of acids more highly sulphuretted than thiosulphuric, and commonly known as the polythionic acids. The relation of these compounds to hyposulphurous or thiosulphuric acid is shown in the following list of the sodium salts and their comparative chemical constitution:—

Thiosulphate of sodium (hypo)	Na ₂ S ₂ O ₃
Dithionate of sodium (hyposulphate).....	Na ₂ S ₂ O ₆
Trithionate of sodium	Na ₂ S ₃ O ₆
Tetrathionate of sodium	Na ₂ S ₄ O ₆
Pentathionate of sodium	Na ₂ S ₅ O ₆

Comparing it with hypo, the tetrathionate (which is also called bisulphuretted hyposulphate of sodium) will be seen to possess two atoms more sulphur and three of oxygen. Its method of formation is by the action of iodine upon the thiosulphate, or precisely the action of iodine when used as an eliminator, the reaction being as follows:—



Or two equivalents each of hypo and iodine result in the formation of two equivalents of iodide of sodium and one of the tetrathionate. Tetrathionic acid itself can be prepared by acting upon the lead or barium salt with sulphuric acid, taking care not to use an excess. It forms a colourless liquid, free from smell, and in the dilute state is tolerably stable; but the concentrated acid is decomposed by heat into sulphuric and sulphurous acids, sulphur being separated. Strong acids decompose it at a gentle heat, and even in dilute solution sulphur or sulphuretted hydrogen being formed in each case. It is also easily decomposed into trithionic acid and sulphur under certain circumstances, the latter acid being even less stable.

From this it will be seen that tetrathionic acid and its salts belong to a curious class, so delicately constituted that very little suffices to bring about decomposition; and possessing as they do so large a

proportion of sulphur, it is scarcely surprising that that should be almost invariably one of the products.

Dithionate of silver has been examined, and is found to enter into combination with the dithionates of the alkali metals forming double salts, in the same manner as hypo; and these salts are similar in their characteristics to the double thiosulphates. No doubt analogous double salts of the higher acids of the series exist, and we can scarcely expect that they will differ very materially from any of the rest of their family. Therefore I am constrained to think that the conversion of hypo into tetrathionate is not a gain to photography.

Indeed, if we examine the reactions of the tetrathionates with the salts of other metals, and study them in relation to photographic operations, we shall find we are no whit better off in dealing with tetrathionate of soda than with hypo, if, indeed, we are not worse. With silver nitrate they form a yellow precipitate, which rapidly changes to black, in the same manner as silver thiosulphate. With salts of mercury a yellow precipitate is first formed, which blackens in some cases spontaneously, in all with heat. The precipitate formed by bichloride of mercury has been found to be composed of a mixture of calomel, sulphide of mercury, and free sulphur. By the addition of ammonia to the solution of tetrathionate some of these reactions are arrested, and no precipitate is formed.

Thus we see that for practical photographic purposes the tetrathionate behaves precisely in the same manner as hypo, and that, therefore, a print or film which has been treated with iodine to eliminate the hypo is in just as bad a state and as unprepared for further treatment, or to resist atmospheric and other influences, as before the application of the eliminator.

It is really surprising how such a substance as iodine, with its well-known reaction with hypo and its products, could ever have been seriously put forward as an eliminator. If it has been used for the purpose, and not found wanting, it can only be because the previous washing has been sufficiently well performed to leave no hypo, or practically none, to be eliminated. But even then there remains the nuisance of the discolouration, as well as the possible reducing action upon the silver image. Indeed, if I mistake not, a dilute solution of iodine has been recommended—by Mr. William England, I think—for the express purpose of reducing over printed proofs. The necessity for hypo elimination and the reduction of the print do not invariably go hand in hand.

The members of the North London Photographic Society, to whom the question I have referred to was addressed, if they be at all in the habit of using eliminators, may, therefore, remain easy in their minds, and not let the doubt as to whether iodine may not be an improvement put them out of the way in the least—can de Javelle will not yet be displaced.

C. BECKETT LLOYD.

A CONVENTION IN MANCHESTER.

Signs are not wanting to prove that the cold reservedness of the typical photographer of the near past, more especially of the provinces, is rapidly giving place to a process of substitution. The existence of the numerous local societies, the operations of the National Photographic Convention, and the many smaller gatherings of the brotherhood, in which the social element is an integral part, indicate most unmistakably that greater harmony and better feeling exist at the present time than formerly obtained.

For the second time since its formation, I had the pleasure of attending a meeting of the Manchester and Hull Photographic Convention, which met in the great centre of cottonopolis on last Friday week. This is a somewhat unique body in its way, having at present no fixed code of rules to squabble over, no sharply defined programme to adhere to, and no utopian scheme under its consideration whereby it hopes ultimately to upset the balance of power in the main body. Now, to the strict adherent to orthodoxy, this might possibly appear a very erratic development, but we are becoming so accustomed nowadays to abrupt departures from ruts almost hallowed by antiquity, that we cease to wonder at any new movement taking root and flourishing, however inconsistent it may appear when gauged by old-fashioned standards and ideas.

Among other gentlemen who attended this convention and took an active part in its proceedings may be mentioned the following:—Mr. G. Caldwell, Nottingham; Mr. J. Hibbet, Sheffield; Mr. T.

Iltingworth, Halifax; Mr. A. Seaman, Chesterfield; Mr. Sale, Leeds; Mr. Wellsted, Hull; Mr. G. V. Yates, Sheffield.

Meeting in Manchester about midday it was but natural we should pay a visit to its great attraction—the Jubilee Exhibition, whither we were conducted by Mr. Sadler, one of the partners of the enterprising firm of Leather, Sadler, & Holmes. The photographic section occupied a large share of attention, being, perhaps, one of the most interesting collections of photographs ever brought together under one roof. Our next visit was to the warehouse of the firm just referred to. Now, it is one thing to speak glibly of warehouses as we are frequently accustomed to do, but it is quite another to stand and gaze on those colossal piles common to Manchester bearing that designation which call up our feelings of astonishment, and even national pride, at the commercial greatness of that world-renowned city.

We were very courteously received by Mr. Holmes, who conducted us over the establishment—a large building of four storeys, every floor of which has been consecrated as a receptacle for the varied requirements of the photographic art. The principal object of interest, however, was a new camera stand, invented and patented by Lafayette, of Dublin, from whom they have purchased all rights belonging thereto, and are about to introduce it to the profession. An invitation to visit a new studio, just erected by Mr. E. Ireland, a well-known photographer in Manchester, was accepted and highly appreciated. Strangely in contrast with those elaborate complications and scientific adjustments in which some delight in, is the simplicity and effectiveness of this studio. One huge skylight in the centre of the roof of a large room is all that need be said to convey an accurate description of it, and yet without the aid of blinds or screens of any kind the most effective and varied forms of lighting can be easily secured without the heat and glare which so often militate against the comfort and convenience of the sitters in our ordinary *ateliers*.

Now, whatever may be the failings and shortcomings of the component parts of this little convention, they are not so erratic as to ignore the fact that the best medium to get at an Englishman's heart is a feast, and I, too, would be one of the last to argue against that theory; what, therefore, could be more natural than an adjournment to Lloyd's Hotel, Chorlton, near Manchester, where, being presided over by Mr. Sadler, the vice-chair being occupied by Mr. W. Barry, of Hull, we all sat down to a capital dinner, which time-honoured and revered institution, believe me, was done ample justice to, and

Whilst brilliant the sallies of Lancashire wit,
Which were flavoured with Yorkshire sauce without grit,
Repatee and tit-bits, too numerous to mention,
Were freely dispensed at this little Convention.

Dinner being over, amongst other subjects which came under discussion was the influence of amateur work on professional photography, which was handled by several of the gentlemen present in right good style. Mr. Barry, of Hull, in a neat little speech, expressed a decided opinion that it was a question of the "survival of the fittest," and if the professional photographers were so apathetic as to allow themselves to be surpassed in the quality of the work produced, they must bow to the inevitable. Mr. G. Cooper, formerly of Hull, having fully endorsed these views, recommended professional photographers to look to their laurels and not allow the wind to be taken out of their sails by the superior work of amateurs. Then followed Mr. J. Crosby, of Rotherham, bristling with eloquence, who expatiated at considerable length upon the gravity of the situation, referring almost pathetically to the reprehensible practice of some amateurs, who, to the great detriment of the profession, habitually sold copies of their productions at little more than cost price for the purpose of covering their own expenses. On Mr. Crosby resuming his seat, a gentleman humorously reminded him that there was nothing like music to soothe his savage breast. The suggestion, amidst loud laughter, was immediately acted upon, and music and song became the order of the evening, in which the Chairman, Messrs. Cooper, Ireland, Crosby, and others took part, until the small hours of the morning were encroached upon, when it was deemed expedient to allow the curtain of forgetfulness to surround the past, and, after wishing each other bright visions of the future in realms of dreamland, we somewhat reluctantly retired. C.

PHOTO-MICROGRAPHY ON THE CONTINENT.

In the *Annales de l'Institut Pasteur* for the month of May, is an excellent article by Dr. E. Roux, sub-director in Pasteur's laboratory, and one of his assistants for carrying on the preventive inoculations in the noble effort, if not curing the malady entirely, at least of lessening the mortality from rales or hydrophobia.

As the article contains some valuable remarks and is illustrated by several photographic prints, ranging from the magnification by the common or ordinary camera lens through the figures of 250, 350, 850, and 900 diameters of the objects, portraying the aspects of bacteria under these amplifications, as the work may not be of easy access to some of your readers, a short review of the paper may be acceptable to them through your valuable pages.

Dr. Roux's contribution is of some length, but here only some of the more interesting points will be stated, as likely to prove of most interest by presenting some novel arrangements in this fascinating branch. It will possibly be remembered by some that Dr. Roux exhibited at M. Pasteur's table in the "Healtheries" some beautiful very small negatives with enlargements from them, and which struck the writer as possessing very much merit, though Dr. Roux, at the present time, is rather in favour of direct magnifications if the enlargements are to exceed 250 diameters. From some work by my friend Mr. Pringle, and which lately gained an award, as also from some of my own small negatives, though these were larger than the small ones exhibited by Dr. Roux, I hardly am ready to agree with this point, yet I freely confess much must depend on the beauty of the original small negatives *per se*, and the microscopic preparations from which they were made. This question may be left *sub judice*. The camera was made according to instructions by MM. Verick et Stiassnie, but Dr. Roux does not consider this form as indispensable, though favourable for high-class work. The microscope is by Verick, his model No. 4, as supplied for histology and bacteriology. Two figures are given, one with the microscope arranged for the production of the negatives, the other as where the object is under microscopical examination. An intermediate piece with sundry motions and removable at will forms the union between the body tube of the microscope and the bellows of the camera, the entire length being 1 m. 80, the bellows having an extension of 1 m. 15, and supported to prevent bellying by a kind of lazy tongs arrangement. Sundry diaphragms are placed in the intermediate piece, and near the sensitised plate, for limiting the circle of light. The intermediate piece is furnished with an additional microscope, provided at the upper part with an eye-piece with crossed wires, and at the lower part with a removable rectangular prism for the purpose of examining and centering the same by the crossed wires on the centre of the screen. The body of this second microscope is capable of being withdrawn, so that when unnecessary it is racked up, as when taking the negative. The microscope with its stand it made to rotate on a pin, so as to conveniently suit for examination of objects in the ordinary way, using the mirror and a small lamp. When the intermediate piece and the microscope are detached, the camera proper can be employed as an ordinary camera. There are arrangements for the coarse and fine adjustments. The slide carrying the sensitised plate is extended in such a way that one end, furnished with a plate of grey or polished glass, becomes the examining screen, while the other end, which is the slide proper, contains the sensitised plate and shutters. The under surface of both plates being exactly in one plane they can be substituted without loss of time or risk of displacing to the focus.

The illumination adopted seems to have very many advantages, and consists of a lantern with a vertical jet (Brins's system) for the oxygen-hydrogen method. The jet consists of two concentric tubes capped and furnished with apertures, the inner one having a central hole to retain the radiant in position. The outer tube is for the passage of the oxygen, the inner for the hydrogen, these two gases striking the radiant vertically from beneath. Instead of using Brins's plan with alumina for the radiant supported on a fine platinum wire, which is held in the central hole of the jet, Dr. Roux makes the little pencils and balls from magnesia.

The method of making them is very simple. Ordinary magnesia in fine powder is mixed in a mortar with water into a stiff paste; this is pushed into a glass tube corked at one end and of somewhat larger bore than is needed for the pencils. When compressed sufficiently, the cork is removed and the mass is forced out and cut off in determinate lengths, a short bit of platinum wire being fixed in the centre of each at one end. If required, these pencils are sub-divided into smaller masses, which are rolled in the fingers into small balls, and then the platinum inserted. These are then subjected to the heat of a stove at the temperature of boiling water for three or four hours. They are now very brittle, and are further dried (*singly*) by being set in the central hole of the jet tube, the hydrogen being gradually turned on so as from a small flame to an increased one; then, after a certain time, the oxygen and hydrogen are allowed to play on them until perfectly dried, when they have acquired a very hard condition and become unalterable in the air—one of these little pencils, three to four millimetres in diameter, lasting for fifty hours continuous work. The lantern is small, portable, and of peculiar construction, with

vertical and horizontal movements for centering, and is made by the noted firm of Dubosq. It is supported on a step from the end of the baseboard with additional legs, but little heat is given off; the light is intensely and highly photogenic and concentrated in surface, and has its own system of lenses and mirror for the production of convergent or divergent illumination. The lantern can be pushed nearer or withdrawn from the microscope, yet remaining central. Coloured glasses or solutions or greyed glass are used to modify the light according to the staining of the preparation. To meet more particularly the various tints given by the aniline dyes, Dr. Roux uses only the "isochromatic plates" of Attout Tailfer, with the addition of a yellow glass screen, which with the above light lengthens the time from one minute to six minutes exposure, according to the preparation and the power or construction of the objective. Dr. Roux praises very highly the "isochromatic plates." The objectives are by Verick et Stiansnic, of Siebert, of Hartnack, and of Zeiss, and are well spoken of; the $\frac{1}{2}$ homogenous immersion of Verick, or Siebert, or Zeiss, being used for the magnifications from 800 to 1000 diameters; the $\frac{1}{3}$ of Zeiss and the $\frac{1}{4}$ of Hartnack for greater magnification, as 1360 diameters. The eye-piece is generally dispensed with. The apochromatic objectives and their projection eye-pieces, as constructed by Zeiss, are most highly approved of as possessing excellent qualities for photo-micrography.

For photographing unstained objects, as bacteria, a magnification not exceeding 500 diameters is recommended, and the illumination to be made by the use of a paraffin lamp. The plates with yeast globules and anthrax, bacillus anthracis *in situ*, which are really excellent, were taken by Verick's No. 8 at 350 diameters, the mirror being used and the microscope placed vertically. Dr. Roux does not mention using the paraffin light without the mirror, as in the crucial test method, and with the aid of the bull's-eye, but most likely this forms part of his practice, as he is a most accomplished microscopist.

The plates are reproduced by the methods known as phototypic, photoglyphic, and heliogravure, Placet's plan, which is, in fact, a galvanoplastic process on copper, light being the direct agent for the reproduction, the artist's hand being unneeded. There is this difficulty, as pointed out in the article, of making the plates in a large page of equal tint or density. Dr. Roux uses the ferrous oxalate developer, with small quantity of the iron solution and some bromide, intensification, when necessary, being made by the use of bichloride of mercury and ammonia. There are numerous precautionary statements and points insisted on, as the camera base resting on caoutchouc to prevent vibration, the method of supporting the intermediate piece and excluding the light at the points of junction, and sundry other details. The arrangement differs from that in general use in this country. The first camera with the additional microscope was suggested by Dr. Miquel and exhibited at his table at the "Healtheries" as made for him by Nechet, along with many most ingenious devices for registering the diurnal variation in the numbers of the bacteria in the air, and the monthly variation—a subject replete with the greatest interest and of moment to all in a hygienic point of view. There is a plan now proposed by M. Raftio, U.S., for utilising two microscopes, one removable the other stationary.

This review has extended beyond the proposed limit, but as the season has now set in for winter employments with the camera and microscope, it is to be hoped it may not be considered as of undue encroachment on the valuable pages of the JOURNAL.

R. L. MADDOX, M.D.

PHOTOGRAPHY IN NATURAL COLOURS.

THE PROBLEM NOT YET SOLVED.

The following, written by G. G. Rockwood, appears in the *New York Tribune*:—

"It has been announced of late that persons in London had discovered the art of reproducing and retaining by photography the colours of nature. Surely nothing in an artistic way could have been more interesting or valuable. Important as was the invention of the Daguerreotype and the subsequent development of the art-science photography, there has always been a desire to see the exquisite tints which we see in nature, and have in miniature upon the ground-glass of the camera, reproduced in some tangible and permanent form. Niepce de St. Victor and other French scientists have obtained upon the Daguerreotype plate some of the colours of foliage, a red-brick house, &c., but the range of colour was limited and the pictures could only be seen in a feeble, non-actinic light—soon fading from view. This was accomplished some twenty years ago, since which time no material advance has been made in this direction. So far as the art of photography as now practised is concerned, I have no expectation that the development of colour will be attained direct from nature.

"Light, as is well known, has three distinct qualities—illumination, heat, and actinism. The latter is the chemical ray, and is that which affects the sensitive plate. A beautiful though somewhat intangible theory obtains that inasmuch as it is this actinic or chemical quality in light which imparts all colour to nature, and without which all vegetation bleaches and becomes white and dies, so we have a right to hope that it will also affect the photographic plate as to give us the beautiful tints of the rainbow! But, unfortunately, colour has value to the photographic plate only as it reflects the rays of light. Some colours, red, yellow, dark green, black (if it is a colour), reflect so feebly the chemical properties of the light as to fail to decompose or reduce the film on the sensitive plate. Photography is based upon the principle that certain salts of silver are decomposed by the action of light. Just in proportion as the film receives the light reflected from the object, so is the deposit of silver compound upon the plate. Simply putting it, a white collar perfectly reflects the light; the black coat reflects but little, and hence a slight action to the plate and a thin deposit. Blue, violet, and their combinations with white, strongly reflect the actinic ray; red, yellow, and their modifications do so but feebly. So, colour has but little effect on the present basis of photography in the way of repeating itself. In view of the wonderful things that have been given to the world in the line of invention during the last half century, I would be a rash man to say that the reproduction of colours is impossible. I think, however, that when it comes to us, it will be through the discovery of some entirely new basis or principle in photography—some colour-sensitive compound entirely away from the present fundamental basis, the salts of silver.

"Now, concerning the alleged discovery by an eminent photographer in London: I was prompt to visit him upon my arrival in London the past summer, and was, I confess, surprised at the results exhibited as the outcome of 'twelve years of study, experiment, and chemical research.' The awful nomenclature adopted by the artist both in his verbal and written comments would impress one with the belief that something novel, to say the least, would be forthcoming. Introducing myself as connected with the *Art Amateur*, and giving no intimation of my occupation as a photographer, I was led into the dimly lighted apartments where the pictures were to be seen. Here were a few indifferent hand-coloured photographs, such as are done (the colouring) for 25 to 50 cents in most establishments. After colouring they had evidently been as we term it, 'glacéd' or given a fine finish by being laid down upon glass with hot gelatine, and then when cold stripped off; the precise thing which the fraternity in America discarded a long time ago, owing to the instability of the aniline colours, or, as this inventor designates them, 'the hydrocarbons.' Noticing duplicate pictures of the same subject, I innocently remarked that 'it must be arduous to a subject to be obliged to sit for each picture as one must do, I suppose, to get the natural colours.' Here followed a cyclone of big words—a few of which my early experience as a reporter and his circulars enabled me to secure. Placing his hand impressively upon me he said: 'The colour rays affect the negative plate in a latent manner, so that they may be made manifest afterward, when a proper medium for their appearance, either selective or otherwise is provided. . . . Therefore the positive plate (which is paper!) being prepared, these vibrations of colour, stopped off and stored up in the negative film, are allowed to become active on the positive film when the exposure again to light (under the negative) takes place! . . . At this point the positive, in conformity to the general idea running through the whole process like a beautiful thread of exactitude, takes up the rates of vibration and the qualities of the vibrations of the negative in a complementary manner, and gives to the positive plate all the characteristics of molecular condition (including latent colour vibrations) that it would have had without the intervention of a negative. It is the true idea of the conservation of energy; it causes the already vibrating molecules to take up and swing in some complicated manner with those particularly absorbed rays!' and so on to the verge of lunacy.

"If we could reduce the above to simple text, our friend claims that he stores up colour vibrations as one would electricity, and the negative thus loaded fires off colour when used to print from. The sitter I took to him had a rich complexion and was dressed in crimson velvet waist and suitable accompanying colours. Whether the negative forgot to do its work or the colour had leaked out I do not know, but the 'proof' was precisely what I would expect from the subject if photographed in the ordinary manner, although assured that 'the greatest opportunity had been given for the various interactions, actinic, photochromatic, and selective, to offset themselves according to the original vibrations (colour and otherwise), to which the beautiful sitter was subjected during the sitting!' I retired to think it over.

"I fear that 'photography in natural colours' is not yet at our command—from this source."

REGISTERING DISSOLVING VIEWS.

ALL lantern exhibitors find the perfect registration of views and effects the "hardest nut to crack," and many systems of carriers, frames, and registration stops, have been arranged to secure coincidence of two views or photographs when projected on the screen. One of the best for showing by means of dissolving view lanterns all

commercial photographs, irrespective of make, is Beard's automatic self-centering carriers. It is only when it is necessary to show views that shall apparently change from one season to another, or from day to night, *without* movement of the objects included in the picture, that the operation is difficult. I shall endeavour to show how this can be performed with absolute certainty. In the first place, the lanterns, two or three, as the case may be, whether side by side or one above the other, must be so constructed that their optical systems are absolutely alike, and capable of projecting the same size discs on the screen; then they must have adjustments to their stages or bodies, so that the angle of inclination can be such as to make the discs superimpose so there is no overlapping.

After lighting up and getting the discs to agree when the lenses are in focus for the particular distance from the screen, the next thing is, get the picture in the optical axis. Now, how is this to be done? If the lanterns were required to be exhibited at one distance only the difficulty would not be great, but as a hinge or hinges, or movement in the vertical or horizontal planes, have to be provided in order to get superposition at different distances, a slight variation is made in the direction of the rays, because no ordinary hinge or movement can be made sufficiently true to always preserve the same line at all portions of its motion, and this variation is magnified by reason of the distance travelled in reaching the screen. It has been usual in first-class apparatus constructed to within recently, to make the stages as true as possible, and then for the operator to register his slides at the distance he generally uses the lanterns at; and even then, if the slide or effect was registered to one stage, it could not be guaranteed that it would register equally well if put into another stage of the lanterns. Mr. J. H. Steward, the optician, has just taken out a patent for a perfect registering stage for lanterns that will achieve exact coincidence of discs and superimpose *similar* views at *any* distance from the screen *in any of the stages*.

It consists of a rising platform or slide runner to the stage that can be elevated by a screw at either end, and when perfectly horizontal that particular position of the front clamped rigidly. Then, as regards the adjustment for securing the stopping, an extra stout and strong pivoted metal finger or stop is provided at the reverse side of the stage to that from which the slides are inserted, and this moves to and from the optical axis of the lantern front, and can be rigidly clamped in that position. By this means, if slides are employed that form a standard, or that have been once registered to the lantern, *all* dissolving pictures can be made to register to them, and when *once* registered will always be absolutely true and exactly coincide on the screen.

For existing lantern these registering adjustments are fitted to a metal back plate that slides into the ordinary stage and can be rigidly fixed in position by clamps. It also holds the metal masks for cutting down pictures to a definite size. So that without sending the apparatus to the optician the owner can fit the patent improvements himself; and if he marks the sliding tubes so that they can always be placed back in the original position if moved, he can preserve the same relative optical angles. For it is found that a partial rotation of the draw tube disarranges the centering.

In order to secure the preliminary adjustment of the lanterns prior to an exhibition, or before registering new lantern slides, special slides are employed. They can be of various designs, but for convenience those employed with the apparatus described are plane cross lines and letters in the open spaces. These are photographed by contact so as to be absolutely alike, and are then (by carefully calipering) fixed with putty into a frame very accurately made to a given size, say, $7 \times 4\frac{1}{2}$ (or if the smaller frames are preferred, 7×4). With these frames each absolutely alike in the lantern stages, the clamps (milled head) are released and the adjusting screws raised or lowered, or moved backwards and forwards, until *all* the crosses and circles agree. The clamps are then screwed home, and the registration is perfectly fixed. For perfect dissolving of views and effects it is a *sine quâ non* that all slides must be framed. A simple method of getting photographs and pictures central in their frames is to have the grooves made full large, so that if the glass is not very exactly cut true, or the mat is not exactly central, the glass can be raised, or lowered, or moved right and left, and the difference between it and the wood filled up with cardboard. If the view and the effect be held up to the light a very close approximation to superposition can be obtained, and then, when the slide is put in the lantern (previously adjusted as explained), the frame can be planed off or added to until the view and the effect or the two similar views exactly agree. For this purpose a shooting board and plane are required, as well as narrow strips of mahogany and glue. From experience it has been found best for new, unframed views and effects to use mahogany frames having about one-sixteenth more wood one edge than the other; this, then,

in nearly every case, prevents any addition being necessary, and the process of planing off this superfluous wood is simple until just the amount is left. Pieces can be added to the end of slides that are short, and those that are long can have the part cut away just where the registering stop comes, or with panoramic movements a brass or wooden stop can be securely screwed to the bottom of the frame to stop dead against the commencement of runner. The end adjusting screws turn down to allow of long slides passing through the stage. Mr. Steward supplies these special brass stops and screws, as well as the thin strips of wood, and if there is any difficulty in getting a local carpenter to supply a shooting board, he can also furnish that. With these materials, the only thing necessary to achieve the *beau idéal* of the lantern operator—viz., perfect registration—is a fair stock of care and patience.

G. R. BAKER.

HARVARD OBSERVATORY AND THE HENRY DRAPER MEMORIAL.

In 1872, Professor Henry Draper first succeeded in photographing the lines of the stellar spectrum. Having secured this triumph for America, he pursued his researches in the same direction until his death in 1882. His skill and ingenuity were alike remarkable. He was not one of those observers who, leaving details to others, try merely to do the final operations. He possessed the quality of thoroughness, and personally attended even to the mechanical details of his investigations. He ground his own specula. It is not too much to say that the work done by him derives a character of value and reliability from the attention to detail that only such an investigator could give it. His powers of handiwork, combined with his scientific standing, make him a model for astronomers. Had dry-plate photography been at his service, his work would have taken a far wider range. But using wet plates that can only bear comparatively short exposures, he was at an immense disadvantage. One interesting feature of his labours was the scientific fellowship of his wife. It is said that he rarely went to his observatory without her. Hence it was with peculiar grace that Mrs. Draper became the founder of the Henry Draper Memorial. From funds of her providing the expense of continuing Dr. Draper's sadly interrupted labours is sustained. No more fitting and useful memorial of the great scientist than this can be thought of. Besides this, Mrs. Draper continues to take a personal interest in the work as done. Apparatus formerly belonging to and constructed by Dr. Draper is soon to be added to the working appliances of the observatory by her liberality. Photographs of the spectra are sent her, and she maintains a vivid interest, because an intelligent one, in the results.

The different buildings containing the instruments and laboratories of the Harvard College Observatory are situated in Cambridge, at quite a distance from the college whose name they bear. They are scattered over the crown of a grassy hill. On entering the grounds the first building seen is the residence of the director, Professor Edward C. Pickering. Directly in the rear of this is the old Harvard College Observatory, with its equatorial and its fifteen-inch telescope, a German instrument, in its day one of the great telescopes of the country, now relegated to the background by the triumphs of Alvan Clark and his sons. Back and to the side of these are what now constitute the principal working portion of the observatory. The most important work done is of the photographic class, and it is this division that we particularly describe. Professor Pickering, however, is also engaged on another investigation, which we can only allude to—the photometry of stars. This is executed by himself personally, with an assistant. A polarisation photometer is employed. The results are of much practical value for use in connexion with astronomical work, and when completed are destined to form a most important standard of reference.

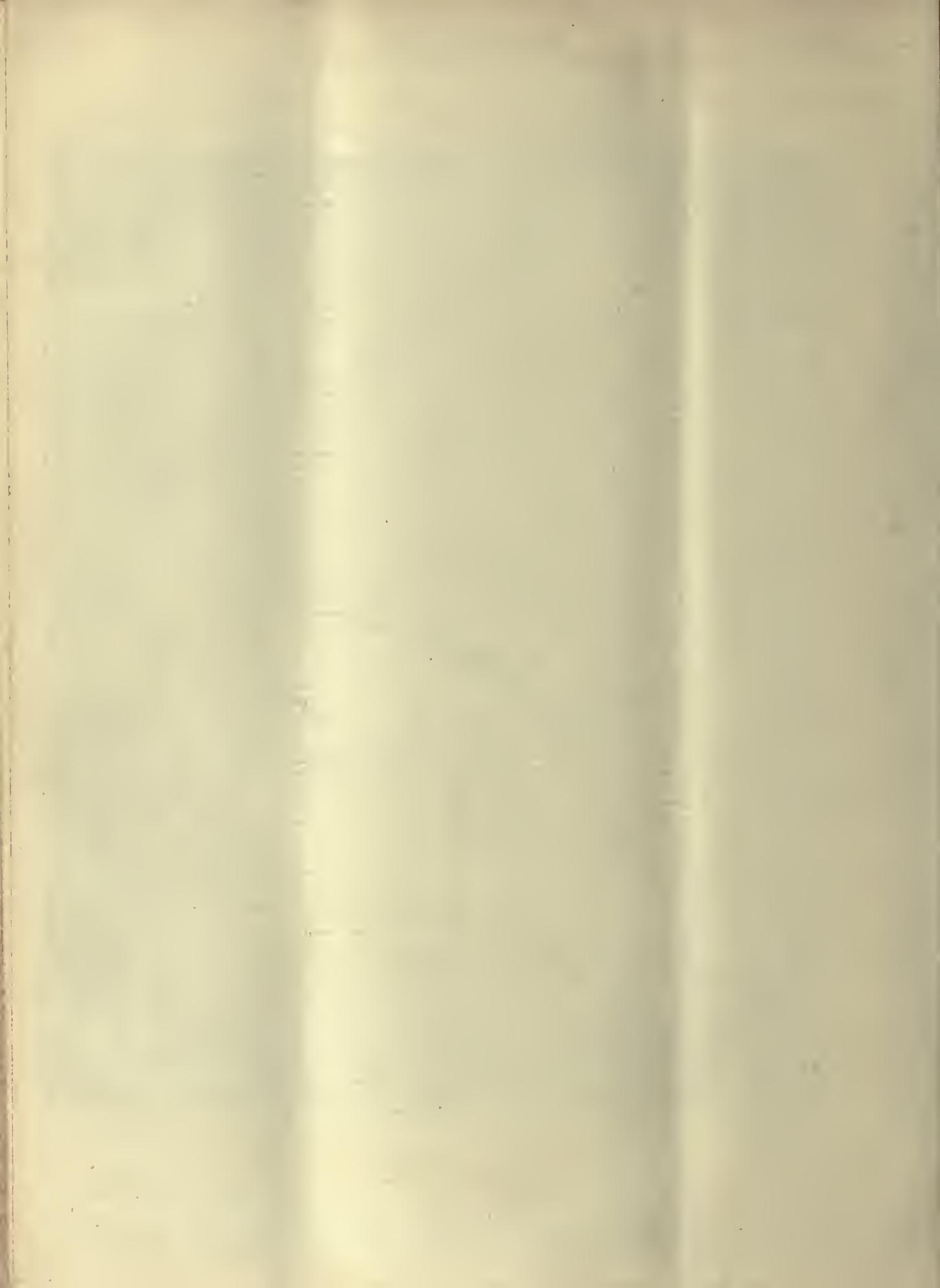
In a recent article on the Alvan Clark establishment, where the great telescopic objectives of the world have been ground, reference was made to photographic objectives. The photographic objectives used by the Harvard Observatory owe their excellence to the Clarks. Such glasses have to be ground with a special view to focussing the actinic rays. A perfect photographic lens would be quite useless for visual work. In testing them, therefore, recourse is had to photography. Photographs are taken of a star, generally Polaris or the pole star, on both sides of the chemical focus. If the lens is such as to bring all the actinic rays to a focus, the effect of photographing the star as described will be to produce a series of images, varying from a disc to a mere point, and then increasing in size again to a disc. The discs will be given by photographs out of focus, the point representing the focussed view. If the lens is perfectly ground, these discs will appear all as evenly illuminated images upon development of the plate. If the lens is out of adjustment, one portion of the disc will develop darker than the rest. One of the discs on the side showed a



Medal.

THE THISTLE.

[W. H. HYSLOP.



spot in the centre, indicating a faulty shape, which had to be remedied by the manual skill of the Clark Brothers. A spectrum of a bright spot is photographed. Such portion of the rays as are brought to a focus will produce a spectrum of even width. If the more actinic portion acts thus, the lens is proved correct. The interpretation of these results demands the highest order of skill in the maker of the lens, and it is not too much to say that the high quality of the Harvard Observatory work could only be obtained through, and is due to, the unrivalled talent of the makers of the objectives.

The telescope is erected on a very solid foundation, one which had been used in observing the transit of Mercury in 1878. Attached to its base is a circular level of exceedingly great delicacy, by which it can when necessary be adjusted. The building in which it stands is rather peculiar. The gable roof is in two sections, being divided across its centre, and is mounted on wheels running on tracks parallel to the ridge. When the instrument is in use, these two segments are pulled apart, to the entire length if desired, of the building, the rails in prolongation of the plate beams being carried outside on each end of the house a distance equal to one-half its length. The mounting of the telescope is also peculiar. A steel tube is carried by trunnions in the end of a large fork. Into this tube the brass tube containing the lenses is screwed. The polar axis is in prolongation of this fork. Hence, if the glass is directed to a given star, and rotated on the axis with sidereal time, the star will occupy the same position in the field of view.

As a simplification of the usual methods of mounting, the plan is of interest. The telescope is carried symmetrically, so that no counter-weights are needed. This saves weight. With it any star can be followed uninterruptedly from rising to setting. Polar stars are as easily kept in the field as any others. It does not seem well adapted for visual work, as the fork mounting would interfere with the observer in the case of polar stars.

The lens is a Voigtländer photographic objective of eight inches aperture, and about forty-five inches focus (exactly 114.6 centimetres). To adapt it for stellar work, two of the faces had to be reground. This brought it into perfect condition. With it much work was done in stellar photography under an appropriation from the Bache fund of the National Academy of Sciences, awarded in 1885. It is now devoted to photography of spectra. In front of the objective a battery of two prisms is carried. At the other end of the tube a sensitive plate occupies the position of the focus. By this extremely simple method, first suggested by Fraunhofer, the spectra of numerous stars are obtained upon a single plate.

For driving it the Huyghenian motion is used. The peculiarity of this system is that it can be rewound without affecting the running of the apparatus. The wheel furnished with a ratchet wheel and pawl is the winding axle. When this is turned, the large driving weight is raised and the small weight descends. But during the winding the driving wheel, the one to the extreme right, is continually urged to rotate just as when the winding ceases. The driving weight never ceases to exert its pull upon this wheel, which represents the drum of the ordinary gravity train.

The original work done by this telescope was purely photographic. Under the Bache appropriation the investigation took the direction of stellar photography. Under the Draper Memorial fund the work of stellar spectroscopy was taken up. The work is now carried on in the following manner.

The prisms are set with their edges horizontal, so that the spectra are vertical. By five or six trials the adjustment for focus is secured, and this lasts for an indefinite period. If now a photographic dry plate is exposed, while the instrument rotates by sidereal time, the spectra of all the stars in the field will fall upon the sensitive plate. However long exposed the plate was, assuming all to be in accurate adjustment, the spectra will appear as very fine lines. Their width in general terms is equal to the diameter of the images that would be photographed were the prisms removed and the telescope directed upon them. The largest of the stars would give only a thread-like line to represent its spectrum. The width of this has to be increased for the spectrum to be visible. While this might be done by magnifying the image, a very ingenious application of the principle of "trailing" is used to partially effect the desired result. If the telescope were kept immovable, the stars by the rotation of the earth would sweep across the field of the instrument. This motion with the prisms in place would affect the spectra in the same way. They would be widened into bands. Except in the case of stars near the poles, the motion of the stars across the field would be far too rapid to sufficiently affect the sensitive film, were the telescope kept motionless. Hence in practice it is rotated, but at a rate slightly less than the angular motion of the earth. This slowly widens the spectra, but allows them to act for a long enough time upon the plates to pro-

duce a good actinic effect. The exposures under present practice are in the neighbourhood of one hour's duration. In this way, instead of narrow, line-like spectra, bands a sixteenth of an inch wide or more are produced. In a subsequent issue we will show how these spectra thus produced appear.

The relative action of the different parts of the apparatus is now clear. The light from the stars strikes the faces of the prisms, and passes through them. The pencil of light from each star is thus refracted, and produces a spectrum with vertical axis and horizontal lines. This falls upon the photographic objective, and is brought thereby to a focus at the lower end of the tube. There it is received upon the sensitive plate, while the telescope by its motion, slightly slower than that of the earth, draws the image out so as to increase its horizontal dimensions and amplify the breadth of the spectrum.

After a sufficient exposure, the plate is taken from the telescope to the dark room and is developed. From the negative thus produced a greatly enlarged positive is produced by the use of the apparatus. The negative is set on edge in a box with ground-glass, and by two brass strips and dark paper it is completely covered, except the narrow area containing the spectrum. Next to this a concave, cylindrical lens is placed. Owing, it may be, to irregularities in the motion of the telescope or to changes in the transparency of the air, the spectra always contain a number of longitudinal streaks. The cylindrical lens, by its dispersive effect, destroys this imperfection. A photographic lens receives the light transmitted through the negative and cylindrical lens, and brings the image to a focus where the image falls upon a sensitive plate. The horizontal streaking is not the only defect of the original spectra. Owing, probably, to variations in the refractive power of the atmosphere, the lines or bars are not perpendicular to the axis of the spectrum. The cylindrical lens is mounted so as to be susceptible of rotation. It is for each spectrum so turned that its axis shall be perpendicular to the inclination of the bars.

The general process is the familiar one of photographic enlargement. Its most characteristic feature is the use of the cylindrical lens and of the metal strips and screen. Great care has to be exercised in this part of the operation to keep the edges of the metal strips clean. Little particles of dust might otherwise appear on the magnified image as spectral lines.

The plate, after due exposure, which is executed by daylight, is developed, and gives a spectrum that may be several inches wide and proportionately long. The bars still appear as crossing it at an angle. To produce a straight spectrum, a portion is marked out, giving the lines at right angles to the axis. Thus the faint light of the stars is re-enforced by the daylight, which produces the enlargement, and which acts like a telegraphic relay.

Such is a brief summary of the methods as now used. The work is still in development. A great many of the spectra are photographed with a large glass and with prisms of higher dispersive power. Neither can the full scope be understood or the progress of the last few years be grasped without an inspection of the different final photographs and of the successive stages in their production.

—Scientific American.

PRINTING AND ENLARGING ON BROMIDE PAPER.

[A Communication to the Derby Photographic Society.]

THE subject of 'bromide enlarging' and contact printing is, no doubt, familiar to many present this evening. My reason for bringing the subject forward and demonstrating before you to-night is, as questions are frequently being asked on this subject, I thought by explaining my method of enlarging, and also by developing a few prints, it might prove beneficial to some of you, and be a practical answer to many queries.

The prints I purpose developing before you to-night have been enlarged by daylight. I usually get a four-legged table and place it near a window having a north-east aspect, and upon it place my camera, with the ground-glass next the window, then darken the room by blocking out the light from all the windows, except the one next to which I am about to work; upon this latter window I put a piece of canary medium, and hang loosely over this a sheet of brown paper. This being done, I fix a mirror outside the window at which I have placed the camera at such an angle that the rays of light from the sky are reflected through the negative about to be enlarged. The negative is then placed in the dark slide of the camera and put in its position, both shutters are drawn, and care must be taken that no light comes into the room except that which comes through the lens. If an enlargement is to be made from a whole-plate negative, or a larger size, the focussing screen can be removed and the negative

put in its stead. An easel with a drawing board attached is then placed at such a distance from the camera according to the size of the enlargement required. A piece of white paper or card is then fixed on the drawing board and the image sharply focussed thereon. When sufficient sharpness has been obtained, the paper or card on the easel which is to receive the enlargement. The lens is then capped, and the piece of brown paper which is hanging loosely over the canary medium on the window is slightly raised to give sufficient light, thereby enabling the operator to fix the bromide paper in its proper position ready for the exposure to be made. Nothing but experience can determine the exposure, but such experience can be gained by one or two trials made on scraps of bromide paper. I may say, however, the greater the enlargement the longer the exposure required. The picture I am now about to develop has been enlarged from a whole-plate negative in the manner already described. The exposure it had was nine minutes. It may seem rather a long time to give, but being one of the dullest months in the year (November) I find it none too much, as you will see.

Now, the next picture, although enlarged to the same size as the last, was from a negative 10×8 . The light being much brighter at the time, the exposure was one and a half minutes, but, of course, much depends upon the negative. I need not mention to you the proportions of the developer, as full directions and proper formulæ are sent out with each packet of paper. With reference to contact printing, I need say but little. Very thin negatives are best printed by a weak, yellow light, like that obtained from a paraffin lamp; this will ensure a vigorous print from a negative that would otherwise be too thin and flat. If daylight is used, one second will be found sufficient in diffused light, or even too much; I should, therefore, recommend artificial light in preference. Again, as regards the exposure, much depends upon the density of the negative. The negatives I shall now print from will require about twelve seconds exposure one foot away from an ordinary gas burner. The development, as you will perceive, is exactly the same as for enlargements. I may add, the paper used to-night is Eastman's A and C.

In conclusion, I must thank you for the kind attention you have paid, and hope that the remarks and demonstrations made to-night may be the means of producing beneficial and practical results.

THOMAS SCOTTON.

HYDROKINONE DEVELOPER.

HAVING since writing, for experiment, doubled the amount of chloride of potash in my formula, and putting up, also as an experiment, one of the highly coloured prints from Routledge's *New Tale of a Tub*, I was surprised to find that the plate came out on development with a yellow tinge over it, as if it had been taken on yellow glass. I tried and tried again, by daylight for the negative and by night (exposing to a duplex burner lamp) for the lantern slide, and the result was that an *unexposed* plate came out yellow all over, and the yellowness disappeared in proportion to the length of the exposure in both cases. The original motive for adding this salt to the developer was that on experiment I found it aided—what shall I call it? how express it?—the dilution of the developer, *i.e.*, a strong solution of the developer would develop up to a dozen plates, but a twelfth (without the chloride) would not develop. I fancy also that it helps to produce a more vigorous negative or lantern slide (positive), but after this (to-day, Saturday) I made up the developer without the chloride, also varying the sulphite by reducing the amount to three-quarters of an ounce, and making up the difference by a quarter of an ounce of meta-bisulphite of potash, and the result is *no* yellowness under any length of exposure, as great, if not greater, density than before, due, I think from old past experiment, to the tartrate, but—well, if not my fancy—a loss of vigour; but, anyhow, if these experiments are of interest, perhaps some explanation, which I am unable to give, of the yellow colour may be afforded by you. It is evidently due to the chloride and length of exposure. If ample exposure is given there is no yellow colour, and the last place it disappears from is the part of the plate resting on the flange of the carrier. In my last I might have added, develop down until the image appears on the reverse of the plate. This developer never stains or “blackens” a plate.

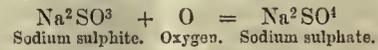
W. T. F. M. INGALL.

THE REGENERATION OF SULPHITE-PRESERVED PYRO SOLUTIONS.

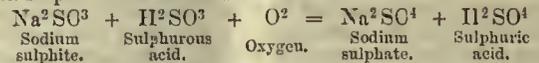
It often happens that, through long keeping or exposure to the air, pyro solutions preserved with sodium sulphite become discoloured, and the sulphite oxidised into sulphate, forms an agent which exerts

powerful retarding action on the developer. This has always been considered one of the main disadvantages consequent on the employment of sodium sulphite as a pyro preservative, and the removal of this objection should, in a great measure, tend to increase the popularity of this method of keeping stock solutions of pyrogallol. It is usual to employ an acid to neutralise the alkaline tendencies of the sulphite, but except in the “Beach” formula, where the acid used (sulphurous) is itself unstable, and liable to be converted, by oxidation, into a sulphate, the small quantity present will exert little or no influence, and may be disregarded in the following method of procedure.

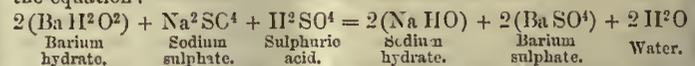
The chemical equation representing the oxidation of the usual sulphite preservative is:—



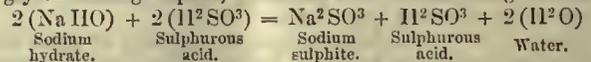
Or when sulphurous acid has been added:—



It is well known that soluble salts of barium undergo double decomposition with soluble sulphates, throwing them down as a finely divided sulphate of barium, insoluble in water and in all acids. It is this property that I have made use of in the regeneration of sulphite-preserved pyro solutions. When barium oxide is added to water it unites with it, forming barium hydrate, which, when added to the oxidised sulphite and sulphurous acid solution as above until precipitation ceases, undergoes double decomposition with them according to the equation:—



If we now add sufficient sulphurous acid to cause the solution to smell strongly of burning sulphur, we shall obtain the following reaction:—



Which is precisely similar to the one originally prepared for the preservation of the pyro; and thus the oxidised solution will have been regenerated and granted a new lease of its life of usefulness.

As in the above operations the pyrogallol (pyrogallic acid) in the solution remains unchanged, I have omitted it in order to simplify the calculations. The copious white precipitate of barium sulphate formed on the addition of the barium hydrate to the oxidised sulphite-pyro solution may be disregarded, or if objected to should be allowed to subside and the clear supernatant liquid removed by decantation, filtration not being in this case available, as the precipitate is so finely divided as to pass through the pores of the filter-paper with the liquid from which it is desired to separate it.

Briefly, the whole operation is as follows:—To the oxidised sulphite-pyro solution add barium-hydrate solution; until precipitation ceases. Then add sulphurous acid until, after well shaking, the liquid continues to smell strongly of burning sulphur.

The barium hydrate should be kept in a closely corked or stoppered bottle, as the carbonic acid present in the air precipitates it in the form of an insoluble carbonate. Should there be any difficulty in obtaining barium oxide (baryta, BaO) it can be easily prepared by heating barium nitrate to redness in a crucible.

Whether this process will prove to be of any practical value I cannot say, but some pyro-sulphite solution, prepared in the early part of 1884, which I recently treated as above described, developed some plates in a very satisfactory manner.

A. P. HIGGINS.

A CONVENIENT WASHING TANK FOR PLATES.

WHILE in Scotland last summer with my detective camera, I bought a few things needed in developing my plates from a dealer in Edinburgh. I enclose you (*Anthony's Photographic Bulletin*) a sketch of a washing tank I obtained from him, that has proved so very useful that I think an account may be of interest to your readers. The device consists of a well-painted tin box, nine and a half inches long, six inches wide, and eight and a half inches deep. In this is a frame stand of painted wire, with loops of wire at each end to be used as lifting handles in taking it out of the tank. To this wire frame is attached a horizontal strip of tin having grooves to catch the bottom of the plates. A vertical strip of the same character, also provided with grooves, is placed near the top of the frame, but below water level. At one end of this tank is a siphon pipe, but of this more anon.

I had for my dark room a very small china closet in the cottage where we had our lodging. I bought two metal pails, one for clear water, the other for slops. Convenient to my right hand I placed the tank I have described filled with water, but not up to the height to

start the siphon. As soon as I had developed a plate and cleaned it, I gave it a washing, say, of one dipper of water from the clear water bucket, then at once placed it in the tank, and so on until I was tired, or had my plates all finished. Then I carried the tank down to the back of the cottage, and when the "burn" was running clear I lifted the frame with its load of plates out of the tank and stood it in the rapid running water of the stream. When this little stream was swollen with rain I filled and emptied the tank, using water from a tap in the yard until I deemed that I had given them changes enough. When going from one place to another I found this tin box took up little room in my trunk, for in it I always packed my glass bottles or graduated measures. Since my return home I have used it in preference to any other form of washing tank, but I have discarded the siphon pipe. That is, I have bored a hole into its high leg, putting it out of use as a siphon, and inserted a run off above its top. I allow a constant stream of water to pass from a tap into this tank, and the outflow is from the siphon and from the opening I provided above it.

The great convenience of this box consists in its loose frame. The plates when lifted from the box can be set on the tank to drain, as I have shown in one of the sketches I send you. The whole thing is inexpensive, but I have not been able to find one like it in America.

—Anthony's Bulletin.

COLEMAN SELLERS.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

At the meeting of this Association on the 6th ult., the President, Mr. G. D. Macdougald, gave an address from which we extract as follows:—

The two great lines along which photography is advancing are—First, as a means of furthering the acquisition of scientific fact; secondly, as a means of producing works of art. And he would, indeed, be rash who would indicate which side or facet of this interesting art-science has the greatest claim to attention.

The art photographer looks upon all technicalities of the art as secondary matters. Experience gained during his ordinary work forces him to recognise the subtle properties which belong to each lens in what he terms his battery, and the wonderful nature of the transformations which occur during the chemical processes, but these things are interesting only as means to an end. So long as these lenses and processes give pictorial results which may appeal through the eye to the heart or mind, he troubles himself little about what appears to him as the terribly dry-as-dust outs and ins of the scientific photographer. The other section of workers are those who look to the scientific possibilities connected with the art. They are photographers because their drawing by the action of light on chemical substances provides them with a weapon of original research, and a powerful instrument for adding to human knowledge. The dynamic or chemical changes which are induced by light are appreciated, in themselves, as a kind of side-door through which may be seen just a little of the manner of the building of the great mystery which we call the universe. The art enables them to write down things that come and go too fast, or which through other causes may not be capable of recognition. An ungenerous artist photographer might be apt to laugh at a scientist's pictures, and to wonder, with some show of reason, why a tiny dot, or a thin line, or a tongue or flame-like mark appearing on a plate, should give exuberant joy. But such things, insignificant in themselves, may have made clear what was before scarcely visible, and have made "the crooked straight, and the rough places plain;" altogether giving ground for as genuine pleasure and satisfaction as the production of a perfect work on canvas or paper.

The picture maker or photographic artist has a rich field in which to exercise his talent—a field, moreover, which in the nature of things must always appeal to a very large, if not the largest, class of persons. It does not require much thinking to become convinced that the power for good or evil of pictures is very great. Pictures speak in a universal tongue. Young and old, rich and poor, lettered and unlettered, may look and understand. The meanest may take away something which may enrich, and make nothing the poorer. It has always appeared to me that in picture exhibitions and galleries we have as powerful a means as is easily within reach of doing good—making gentle the manners and giving tone to a community. Scenes from life, the fruits of the imagination, and nature herself, are reflected in pictures, and it follows that pictures must prove in the highest degree attractive so long as nature and life are interesting.

There has been considerable discussion among photographers on the one hand, and other picture producers on the other, as to whether photography has a right to be considered a fine art, and I would be the last to drag into review what has appeared to me on more than one occasion to be very unprofitable discussion. Whether photography be reckoned a fine art or not, it must be borne in mind that if it has advantages over the brush, in one or two particulars it is balanced by weak points, and very weak ones too.

The absence of colour would not be so much felt if the art was com-

petent to reproduce the photometric values of various colours. But in this the ordinary processes of photography fail very conspicuously. Coloured objects not only cannot be photographed in colour, but the shades which represent these colours in the photograph have not the proportionate luminosity that the colours present to the eye. This is a very serious defect, and renders photography unable to reproduce certain effects. The ordinary photograph is a picture which may be compared, as regards light and shade, to what may be seen while looking through coloured spectacles. The difficulty of overcoming this defect is increased by the fact that the various sensitive substances used by the photographer have each their own way of interpreting colour. Iodide of silver gives one tone value, bromide of silver another, and chloride of silver a third, so that any attempt to isochromatise, if it be successful, will prove of value only when used with one or other of the sensitive substances.

Efforts have been made to overcome this shortcoming. These are based on filtering through coloured media the light which is to operate on the sensitive material, the colours being adapted to the particular sensitive material, so as to increase their value in proportion to the want of sensitiveness for those colours on the part of the plate. I have likened an ordinary photograph, as regards shade value, to what one may see through a pair of coloured spectacles. Now, if when looking, say, at a landscape, through a pair of coloured spectacles, we take another pair of a colour complementary to the first pair, and look through both pairs simultaneously, we will see the landscape reduced in intensity, but, as regards shade value, as if we had no spectacles on at all. An exactly similar process is adopted in recent photographic methods. The sensitive substance on the plate is acted upon by light which has passed through a coloured medium, either present as a stain on the plate itself, or as a piece of coloured glass at the back or in front of the lens. But, after all, such devices, although they effect an undoubted improvement, do not altogether overcome the difficulty.

Photographing in colour is yet a thing of the future. It is known that chloride of silver, under certain conditions, exhibits the various colours under which it may have been exposed to light. But the effect is fugitive. The molecular grouping, or vibratory condition which gives rise to the colour, is at once destroyed on the application of the chemical substance necessary for fixing. During the present year the newspapers announced that some fortunate individual had succeeded in photographing in colour (an announcement which, by the way, has been made at intervals during the last twenty years), but so far as I know, specimens of the new process have not yet reached the album of this Association, and we may fairly assume, although the album is filling very slowly, that specimens, when they do arrive, will not find room in its pages. And were this photographing in colour an accomplished fact, I question if it would take the high place some people are prepared to give it. The most perfect colouring, together with perfect outline and detail, will not make up for the difference that exists between a photograph and a painting. The photograph will always bear an impress as of machine make. We may imagine the photograph of the future already in existence, and assume the presence of colour produced by a photographic process—it will then bear as perfect a resemblance to nature as is possible, and yet, in my view, the direct painting will certainly hold its own in point of human interest. And why? Because the painting is an interpretation of things, wrought out from first to last through the living agency of a human being. The photograph, although controlled by mind, and evidently bearing the impress of thought, is the result of the operation of a machine. The producing force in the one case is mind, which carefully and laboriously, and by prolonged effort, aided only by a bundle of hairs, or a palette knife, converts a few pigments into a picture. In the other case, although the guiding force necessarily is mind, the actual producing force may be summed up in the touching of a spring, and in the operation of lenses and chemical processes. There is no laborious striving and constant effort of the mind during production.

It appears to me that this looking at things through the mind and eyes of another human being, which in fine constitutes the difference between pure photography and painting, is the point round which centres the peculiar interest of direct art, and that which to the end of time will place painting outwith the reach of an art which calls in the aid of machinery. Pictures and poetry are two things which are not improved by machinery.

Painting will always be as interesting to the art public as novels are to the reading public. In both we see in as perfect a way as possible the impressions that life and nature make on our fellow beings. To certain minds it may appear that painting is a laborious and highly unscientific method of making a picture as compared with photography, which is so instantaneous, and so much in keeping with the times, but an impartial judge must admit that the breath of life which is in the best works of painted art is not to be found to the same extent in photography. As well look for the peculiar poetical force of the opera in a drama.

In one department of photography literal representation by the camera has become unfashionable. Portraits are not now given to the public which are altogether the work of the camera. The friction which existed between the professional portrait photographer and his clients has resulted in the discovery that pure photography will not do, and we have now in modern portraits, almost without exception, a combination of camera and pencil. Now, how has this come about? It used to be quite a popular fancy, and it is so still to a great extent, that the camera alone will give a faithful and true facial representation. A more or less dissatisfied sitter was reminded by the photographer that the camera

could not lie; the carefully cherished and apparently axiomatic doctrine which asserted that any representation was neither worse nor better looking than the sitter at the moment was brought into requisition. But all this kind of thing proved of little use against public opinion; "against a sea of trouble" the pencil had to be taken in hand.

Now, speaking mildly, the tendency of the camera alone is to produce a portrait which does not flatter; and speaking with scientific accuracy, the unaided camera does not give a true and faithful representation of the human face. The human face is a more or less red-coloured object, and any line, or depression, or mark, or the most mildly coloured freckle, is magnified in intensity out of all proportion to the intensity as seen by the eye. The light emanating from lines, hollows, or other inequalities is altered through reflection and absorption, and of course does not possess a photographic effect on the plate equal to the luminosity appreciated by the eye. The photographer, through pressure of unsatisfied clients, and a wish to do his best at any hazard, has found a remedy, as I have already indicated, in the pencil; and in using his remedy we cannot very much object if he errs a little towards idealisation, and the production of portraits which do occasionally pleasantly astonish those who have a mild opinion of their own good looks, but which in the majority of cases, after all, come but barely up to expectation and self-appreciation. The pencil, then, has already taken its place permanently as an implement in the photographic artists' tool-box, and no instrument has a better right to be there for the correction of defective tones or shades.

Whether it is legitimate to materially alter *form* as well as shade I do not dare to express more than a very humble opinion. I observed not very long ago a photograph of Mrs. Langtry, in which, with the aid of the pencil, some inches—I was about to say three or four, but I hesitate to say so much—were neatly cut off her waist, and an inch and a half—I am perfectly certain about that figure—was sliced off what had been in the original photograph her shoulders. Is this legitimate? Well, I am inclined to think, yes, so long as it is done so well as to baffle detection. I do not, in this instance, mean to affirm that the camera lied as to Mrs. Langtry's actual form or contour, which apparently, in the view of the artist, required some slight modification. On the contrary, I believe what was tried to be hidden was very nearly, if not quite the truth, and what was wanted to be shown was very decidedly not the truth, and yet with this plainly before me I confess I was quite pleased that the artist had done something to assist nature. I am personally quite willing to look at a carved figure—something moulded into bewitching proportions—if it be well and cleverly done, and, above all, beautiful. In the pencil the portrait photographer possesses an instrument of Mephistophelian power. The old are made young, and the plump are sliced down. Things, by the force of circumstances, are no longer kept as they are. Complete power is given to make them, from the artistic point of view, as they ought to be. And it cannot be gainsaid that things should be made, even in a forcible manner, as they ought to be.

In pure landscape work, is the use of the pencil legitimate? In "doctoring" a negative are we stooping to something which we ought to keep secret and be ashamed of? So long as the object in taking a picture is pictorial effect and not that a Procurator-Fiscal or Coroner may use it in their professional capacity, then every available aid is perfectly legitimate, and instead of being ashamed to admit that a negative has been "doctored," pride should be taken in the amount of judgment and skill displayed towards enhancing effect. Doctoring and masking for cloud effect is now, by general consent, allowed, but anything further on a landscape is as yet locked on, by some at least, as outside what should be allowed, say, to compete in a photographic exhibition. If I may be permitted to express my opinion, I think that the use of the pencil or brush to modify negatives ought to be encouraged amongst the members of such societies as this, for in and by it we have a means of raising the art of picture production to a high level, and combining the undoubted advantages of photography with the supreme advantages of direct art.

It may be advanced by those opposed to this view, that were it carried into effect, the sharp line which separates photographic from direct artwork would disappear, and in many cases it would be difficult to say of particular pictures how much was photograph and how much was not. On the other hand, it will be admitted that the most elaborate retouching of a negative will never take from it the characteristics of a photo-picture, and allowing this were not the case, it is a question whether the sharp line which separates the arts should not be suppressed as much as possible. Is it of importance that we should discover how much is due to the operation of one tool and how much to another? While looking at some masterful painting, do we ask how many models have been before the artist during its production? In other words, how much is copy and how much is imagination? As a rule, we are content with the result of copy and imagination in any proportion, if there be produced a thing of sufficient interest or beauty to give pleasure. I think we may look forward to great development in the application of direct art to photography, with a corresponding increase in interest and artistic excellence.

THE headquarters of the Cardiff Society narrowly escaped serious damage in the early morn of the 13th instant. The telephone rooms on the same floor suffered severely, and the adjacent lecture theatre, together with four shops, were completely gutted.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
November 21 ..	Notts	Institute, 9, Shakespeare-street.
" 22 ..	Great Britain (Technical)	5A, Pall Mall East.
" 22 ..	Bolton Club	The Studio, Chancery-lane, Bolton.
" 23 ..	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 24 ..	Burton-on-Trent	
" 24 ..	Liverpool Amateur	Royal Institution, Colquitt-street.
" 24 ..	Oldham	The Lyceum, Oldham.
" 24 ..	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.
ON Thursday night, November 10, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. J. Traill Taylor presided.

The Chairman exhibited a pneumatic shutter invented by Mr. Perken, jun., which gave either instantaneous or time exposures of any duration at will. It had an aluminium flap which was actuated by a circular plate in such a manner as to avoid all vibration or jar from the up and down motions. Although operated by a pneumatic ball and tube, this was not a necessity in its construction, as there was also a small trigger by which the exposure could be made. He (the Chairman) considered it one of the best shutters he had seen, and, in reply to a question, said it was manufactured by Perken, Son, & Rayment.

The shutter was passed around and examined with much attention, and elicited expressions of approval.

Mr. COOKE exhibited a negative covered with objectionable stains which he thought might have been caused by the possible use of an unclean dish which had contained perchloride of iron.

Mr. A. COWAN thought from the colour that it was an iron deposit.

Mr. W. M. ASHMAN said that in such case it was best to soak the plate for some time in water, and then treat it with cyanide of potassium; any faint blue colour afterwards left would not be likely to interfere with printing.

Mr. W. BEDFORD remarked that the stains upon the plate were in tears, so seemed to have been formed in the process of drying.

Mr. BUCHANAN WOLLASTON said that the plate appeared to have been splashed with some solution.

Mr. C. HEINRICH TRINKS thought that removing the iron stain with cyanide of potassium would be likely to reduce the negative a little.

Mr. H. M. SMITH had that day spoilt some negatives by dropping pyrogallol solution over them; it had acted upon the plates for an hour before he became aware of the accident.

Mr. HIGGINS suggested that citric acid and alum might remove the pyrogallol spots.

Mr. EVERETT thought that makers should put more emulsion upon their plates; he had been working upon an interior which gave a good picture upon a properly coated plate and a bad one upon all thinly coated plates.

THE CHAIRMAN said that anything dark in optical contact with the back of the plate would stop halation.

Mr. W. COBB remarked that as halation existed in nature he did not see why it should not be reproduced in photographs; he had seen beautiful pictorial effects produced by so-called halation.

Mr. COOKE said that the eye did not see halation as produced in photographs.

Mr. COWAN had taken a photograph by daylight of a dead body with four lighted candles near it; the wet process was used, and he went to lunch during the exposure. When the plate was developed an oval was above the top of each candle, produced by the lowering of the flame as the candle burnt down.

Mr. F. W. COX had taken notes in a public exhibition of certain paintings in which the artists had purposely introduced what photographers call halation, notably in one instance in which the edges of trees were softened, the background being the light of the setting sun.

THE CHAIRMAN said that a member desired to call attention to a statement in an American journal about a negative which included an alleged rainbow, which negative had been exhibited before a London society some time ago by Mr. Plumer, who had received it from a friend.

Mr. COOKE remarked that it was no rainbow, but a rope or something of that kind out of focus.

Mr. TRINKS had recently, at Molde, in Norway, seen a rainbow with four others beneath it—five rainbows in all. He regretted that he had no camera with him at the time.

Mr. J. JACKSON exhibited the lantern slides accidentally coloured by a gold deposit, as described at a previous meeting.

Mr. COOKE remarked that the colours had accidentally distributed themselves upon the plates in such a manner as to represent fine sunsets.

Mr. L. MEDLAND exhibited a lantern slide in which a warm brown image had been obtained by hydrokinone development. He also exhibited another plate on which dark spots had flashed out in the first moments of development.

Mr. ASHMAN said that the spots were due to an imperfectly cleaned glass plate. When a plate is cleaned with whiting the latter may lodge in any minute holes in the plate and afterwards cause spots, especially in the wet process.

Mr. TRINKS had been experimenting with Professor Abbe's new microscopic eye-piece for projections; it gave an exceedingly flat field and equal illumination. The eye-piece was a valuable new auxiliary in photo-micrographic work.

THE CHAIRMAN asked whether it could not be made of larger size for larger objects, such as lantern slides, so as to project more perfectly defined images upon the screen.

Mr. TRINKS saw no reason why that could not be done. The new eye-piece permitted the use of diaphragms and the distance between the lenses could be varied.

THE CHAIRMAN said that the tiny locket lenses now on sale at a cheap rate would project large objects, such as flies, admirably with a good light.

Mr. TRINKS added that Abbe's eye-piece had several reflecting surfaces, nevertheless, the available light was utilised to more advantage by its aid. Long exposures did not matter for most photo-micrographic work if the spring of the fine adjustment screw were removed to prevent change of focus by change of temperature.

Mr. J. J. BRIGINSHAW stated that another remedy was to let the instrument get thoroughly and equally warm before commencing operations. The best English microscopes had not the spring spoken of by Mr. Trinks, but an exceedingly fine screw in place thereof.

The CHAIRMAN asked Mr. Jackson whether he knew how M. Nadar obtained almost chocolate tones in his bromide enlargements.

Mr. JACKSON did not know. Could the Chairman tell him?

The CHAIRMAN thought that instead of throwing away the old ferrous oxalate developer it was kept and used again and again; the longer it was kept in use the better tones did it give. A good way to keep the ferrous oxalate developer in solution was to have a little spout at the bottom of the bottle, to which spout an indiarubber tube was attached; after drawing off what was wanted the mouth of the tube was passed through the neck of the bottle, so that it remained below the level of the surface of the iron solution. That surface was covered with paraffin oil to protect it from the action of the atmosphere.

Messrs. Herbert Fry, Norman Macbeth and D. W. Allen, were elected members of the Association.

CAMERA CLUB.

ON Thursday, November 10, Mr. W. H. HYSLOP read a paper entitled *Marine Photography*. Mr. Lyonel Clark occupied the chair. The screens and walls of the room were adorned with pictures all bearing on the subject of the evening, a course which will be adopted in future, as, for instance, on the 24th, when *Enlarging* comes on for discussion. In the course of his paper Mr. Hyslop gave a general description of his apparatus and of his method of working his large camera at sea, and expressed an opinion that a certain amount of seamanship was requisite in photographing moving vessels from a vessel itself in motion.

Mr. A. HAMILTON CLARK followed with particulars of his experiences, and the discussion was carried on by Messrs. G. Davison, C. Burton Barber, E. R. Shipton, Moens, A. Deed, J. F. Roberts, and Plomer.

The CHAIRMAN, in conclusion, gave an address upon the same subject, and explained a table he had prepared from a well-known formula for finding the distance (lens and plate being given) at which an object of a certain size would about fill the plate.

The subject for Thursday, November 24, is *Enlarging*, when Mr. D. P. Rodgers will read a paper, and Messrs. Austin, Lyonel Clark, Bolden, and others, will arrange to follow and show examples. Meeting at eight p.m.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Exhibition of the Photographic Society of Great Britain was open on the 11th instant for the benefit of the Benevolent Association, and was exceedingly well attended.

Mr. T. SEBASTIAN DAVIS, addressing the assembly, said on behalf of the Committee of the Photographers' Benevolent Association he desired to express gratification that such a large number of ladies and gentlemen were present that evening, thereby showing a widespread sympathy with the movement. He then briefly alluded to the objects of the Society, and especially its important function of, as far as possible, procuring employment for members, the best means of preventing them falling into a needy condition. The Society, he said, founded in 1873, had of late made rapid strides. Since they met in the Exhibition Gallery last year all present would be interested to learn that no less than one hundred and forty new members had been elected. He was glad the Photographic Society of Great Britain fully recognised the claims of the Benevolent Association and gave the Committee a helping hand. He considered it a duty of every photographic society in the country to help forward the aims of the Photographers' Benevolent Association by strengthening the hands of the Committee.

Slides lent by the following gentlemen were then shown on the screen:—Messrs. Wilson, Short, Davison, Samuels, Briginshaw, Klosz, H. M. Smith, G. Smith, England, Freshwater, Pilkington, and Hastings; Messrs. Briginshaw, Clifton, and Mackie acting as Lantern Committee.

At the conclusion of the lantern display, Professor W. F. DONKIN projected an image of the electric arc used in the lantern on the screen, and gave a lucid explanation of what takes place at the carbon poles in the production of an intense electric light.

Mr. DAVIS, in terminating the proceedings, thanked the visitors for their presence, and hoped they had enjoyed the display of so many excellent transparencies. He desired to tender the thanks of the meeting to those gentlemen who had kindly lent slides, and to the Council of the Photographic Society for the use of their Exhibition.

These remarks were received with much applause; so also was the announcement that three hundred and seventy persons had passed the turnstile that evening, meaning a considerable addition to the funds.

BOLTON PHOTOGRAPHIC SOCIETY.

THE annual meeting of the above Society was held at the Baths, Bridgman-street, on Thursday, November 3.

The Hon. Treasurer, Mr. C. K. Dalton, produced his accounts for audit, which were pronounced correct, and a decent balance to carry forward.

The ballot papers were then counted and the following gentlemen declared elected to the Council:—*President*: Mr. J. R. Bridson,—*Vice-Presidents*:

Messrs. R. Harwood, T. Parkinson, E. N. Ashworth, J. W. Cundey, W. Knowles, and J. W. Hawksworth.—*Council*: Messrs. J. Boothroyd, J. Leash, R. Mercer, J. Lomax, Thomas Davis, and William Lalthwaite.—*Hon. Treasurer*: Mr. C. K. Dalton.—*Hon. Secretary*: Mr. B. H. Abbott.

Messrs. J. H. Cowan, Walter Staton, W. F. Bowen, and A. Harper were elected members.

The SECRETARY then read the annual report, which was approved.

Mr. W. Lalthwaite exhibited one of Newman's patent diaphragmatic time shutters, which was much admired.

The Secretary exhibited one of R. Thomas's (of Leicester) Simplex changing box and dark slide combined.

There was a lantern exhibition by Mr. W. Boothroyd, and Mr. J. Boothroyd showed some ninety slides he had made, many of which were highly commended.

The meeting dispersed shortly after ten o'clock.

DERBY PHOTOGRAPHIC SOCIETY.

THE second indoor meeting of the winter session of this Society was held in their Rooms, 33, Victoria-street, on Tuesday, November 8, when upwards of fifty members were present to witness a demonstration on *Printing and Enlarging on Bromide Paper*, by Mr. Thomas Scotton [see page 729]. The process, so deftly manipulated by Mr. Scotton, was much admired, both in the development of the enlargements and in the printing of pictures from small negatives by the aid of an ordinary gas flame.

Discussion upon various questions ensued, and votes of thanks were passed to Mr. Scotton for his excellent paper and demonstration, and to Mr. R. Keene for presiding.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE usual fortnightly meeting of the above Society was held at the Technical Schools, Bridge-street, Birmingham, on November 10,—Mr. A. Pumphrey in the chair.

Mr. John Graham Keys was elected a member.

The HON. SECRETARY (Mr. J. H. Pickard) read a letter from Mr. W. J. Harrison, proposing a new rule, that three Vice-Presidents should be elected for the ensuing year, and offering to resign the office of Vice-President. Also letters from Mr. R. Godfrey, offering a paper, subject, *Don't!*; and from Mr. E. H. Jaques, subject, *The Land of the Midnight Sun*; from Mr. W. Tylar, paper on *Double Contact Printing as applied to Lantern Slides*; and prizes were offered by Messrs. A. Constantine, F. Hoskins, E. H. Jaques, and W. Tylar, the first-named mentioning as competition for his prize "Stereoscopic work," saying he thought this class of work had been sadly neglected of late years. He also read the list of twenty-one names nominated for election at the annual meeting on the 24th instant, from which the officers and Council for the ensuing year will have to be selected; also the attendance list of Council for the past year; and gave notice of proposed new rules and alterations.

A number of frames filled with very fine photo-micrographs on Eastman bromide paper were shown by Mr. J. F. Hall Edwards, which were much admired, and the thanks of the meeting were given to the exhibitor for the loan of the same.

Mr. E. C. MIDDLETON then gave his paper on *Collotype and Photo-lithography*. He exhibited a fine collection of collotype prints, and explained the process of their production from the taking of the negative to the finished prints. He then went more fully into the process of photo-lithography, and successfully inked up several transfers from line subjects. Afterwards he entered with great minuteness into the carbon process, and gave a very practical demonstration, from the sensitising of the tissue to the finished print, including development on both opal and paper. In the course of his remarks he mentioned the ease with which these can now be done from the Eastman Company's stripping films, through being able to print from either side of the film negative. Single transfer only is needed, thus obviating the extra trouble and time taken up by double transfer.

The lecturer was listened to with great attention and received much applause.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

THE annual meeting of the above was held in the Free Public Library on Thursday evening, the 10th instant,—The President (Mr. J. A. Forrest) in the chair.

The minutes of the previous meeting having been read and passed, the election of officers for 1888 was proceeded with, when the following gentlemen were unanimously elected, viz.:—*President*: John H. Day.—*Vice-President*: Paul Lange.—*Treasurer*: Edward Whalley.—*Auditors*: F. Evans and A. W. Cornish.—*Council*: A. W. Beer, B. J. Sayce, G. A. Kenyon, M. D., J. A. Forrest, H. H. Williams, W. P. Riley, R. W. Hill, H. Lupton, P. H. Phillips, and T. C. James.—*Secretary*: George A. Carruthers, Woodley, Rock Ferry.

A hearty vote of thanks, proposed by Mr. A. W. BEER, and seconded by Mr. B. J. SAYCE, was tendered Mr. Forrest for his indefatigable exertions on behalf of the Association, in which both gentlemen spoke of his unvarying courtesy and *savoir-faire* during the three years he had occupied the chair.

In replying, Mr. FORREST, among other matters, alluded to the fact that he was then celebrating his jubilee of photography, and handed round photographs of several pioneers of the art, *collaborateurs* with himself when he first commenced its practice.

The annual report and Treasurer's accounts were read and passed, the latter showing a balance in hand to the credit of the Association of 11s. 2s. 10d.

The resignation of the Vice-President, Mr. H. N. Atkins, through failing health, was received with regret, his labours on behalf of the Association being highly appreciated.

The annual competition prints were handed in during the evening, the new

medals of the Association offered as prizes having apparently a favourable influence on their number and quality as compared with previous years. The Judges, Messrs. G. E. Thompson, R. Hartley, and H. J. Whiteside, unanimously awarded the prizes as follows:—Silver medals: "Best picture," John H. Day; "Best set of pictures," H. Lupton. Bronze medals: "A pretty face," George A. Carruthers; "Village street view," A. W. Beer; "Flower study," James A. Forrest; "Instantaneous," H. Lupton; "Animal study," George A. Carruthers; "Winter scene," Paul Lange.

The number of competitors in comparison with the strength of the Association not being as large as they should be, it was felt that the present mode of awarding the prizes, viz., for previously selected subjects, was capable of improvement. Mr. J. H. DAY, therefore, to test the feeling of the members on the subject, brought forward the following recommendation:—"That the system which has hitherto prevailed of selecting special subjects for annual competition be abolished, and that in place thereof a silver and bronze medal be awarded for the two best sets of six pictures respectively, irrespective of subject or size, which may be sent in upon a date selected by the Council, of which due notice be given upon the circular."

An animated discussion *pro* and *con* then took place, but, on being put to the vote, the proposal in its original form was passed by a large majority.

In reference to the above plan of giving medals for the best pictures of six specially selected studies, Mr. SAYCE said he had always considered such a practice was no test of skill on the part of the prize winners, but that success in such competitions was principally attributable to opportunities of securing such subjects under the most favourable circumstances; and those who had most time and funds at their disposal had a much better chance of carrying off the medals than others who, perhaps more skilful, did not possess the advantage of liberty to roam in search of models. In athletic competitions, for example, all candidates for the prize must be present when the moment for trial arrives; prizes for a race are not awarded to those who run the same distance in different localities, but all must assemble at the same spot and do their best, under fixed conditions, to secure the coveted prize. He considered that the only fair way of awarding a prize for best work of a society was to have a day and *rendezvous* appointed when all desirous of ascertaining their relative position as photographers should assemble, and, no matter what might be the state of the weather—fine, windy, wet, or foggy—each should do his utmost to arrive at the best photographic and artistic reproduction of the neighbourhood selected; all conditions being thus equal the award to skill would be more truly granted.

After considerable discussion as to conditions, in which Mr. BEER suggested that the number of exposures should be limited to six, Mr. SAYCE proposed the following resolution, which was seconded by Mr. P. LANGE:—"That, on a given day, and at a given *rendezvous*, members of the Birkenhead Photographic Association shall meet for the purpose of testing their skill in photography and artistic treatment of subject, and that on such occasion only six exposures shall be made by each competitor, and a resulting print from the untouched negative of every exposure shall be handed in by the competitor at the second ordinary meeting after such outdoor meeting, and that the Judges shall award a silver medal for the best and a bronze medal for the second best set of six exposures."

The idea met with the approval of the members, and the resolution, on a show of hands being called for, was carried.

Mr. H. WILKINSON remarked that he hailed the innovation with much pleasure, for, only having had some three days' holiday, all of which with one exception were wet, he had been entirely debarred from entering this year's competition.

This being all the business there was to transact, the meeting broke up.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

A REGULAR meeting of the above Society was held in the Mayor's parlour, Old Town Hall, on November 9.—Mr. George Bankart, President, in the chair.

The minutes of the last meeting were read and confirmed.

Two members were proposed and two members balloted for and unanimously elected.

The PRESIDENT then called on Mr. Wilkinson to give his promised demonstration on *Bromide Printing and Development*, more particularly with reference to double printing from elond negatives.

In his opening remarks, Mr. WILKINSON premised that he was unable to understand why amateurs so persistently stuck to silver printing when the beautiful results which the bromide papers gave could be obtained with ease and success. Carbon and platinum printing, both giving results excellent in their way, could only be practised by daylight, while the Eastman bromide paper, with little attention, would give results equalling either. In proof of which assertion, he proceeded to demonstrate by printing by gaslight from a somewhat dense negative of Tintern Abbey, and by an arrangement of masks roughly cut out of paper and registered in two frames; he inserted in the print a double print from a separate cloud negative, the result showing an admirably exposed print with the clouds faithfully rendered.

After explaining *in extenso* the detail of the process, and replying to several questions asked by members, a vote of thanks, proposed by Mr. TUCKER and seconded by Mr. HEMLEY, was unanimously accorded to Mr. Wilkinson for his useful and instructive address.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE opening meeting of the Session was held on Thursday, November 3, in the Philosophical Society's Rooms, 207, Bath-street.—Mr. William Lang, jun., F.C.S., presiding.

Minutes of last meeting were read and confirmed.

Mr. Andrew Bryce, Engineer, 13, Abercromby-street, was unanimously admitted a member.

The President now vacated the chair for the purpose of delivering his opening address, and the Vice-President (Mr. A. Robertson) occupied the chair during the rest of the meeting.

The subject of Mr. Lang's address was *Photography on the Continent*, and, being illustrated by some splendid examples of lithdruck, phototype, and photographic prints, proved exceedingly interesting.

Mr. LANG, as convener of the Photographic Section of the Glasgow International Exhibition, 1888, was delegated to proceed to the principal cities on the Continent for the purpose of procuring exhibits. He, therefore, gave a graphic account of his travels; the various towns he had visited; the men well known in photography, such as Vidal, Stebbing, Liesegang, Obernetter, Otto, &c., he had come in contact with; the studios and photo-engraving works he had been kindly permitted to see through; and many little things which occurred *en route*; the whole proving very interesting and racy, and was thoroughly enjoyed by all present.

PRESIDENT'S ADDRESS.

GENTLEMEN.—Since our last meeting a good deal has happened that is not without interest to a Photographic Association such as ours. The Photographic Convention of the United Kingdom held its second meeting in our own town early in July, and that it was a success I think no one will be prepared to dispute. We were favoured, on the whole, with charming weather for the excursions, and the photographic material in the shape of papers brought forward night after night during the week the Convention lasted was a sufficient evidence that photography is by no means to be considered dormant, that whether we regard it as an art or as a science, it possesses a vitality that is all its own. I need not enlarge further on this matter, but simply express the hope that when the next meeting comes to be held in Birmingham, as many of our members who can possibly spare the time will wend their way southwards next summer to Birmingham, to testify by their presence their interest in the annual gathering of the photographers of the United Kingdom.

Gentlemen, time rolls on and each succeeding year brings with it its invariably series of changes. Since last we met two honoured names have passed away—Tunny, of Edinburgh, and Robert Hunt, F.R.S., of London. With the former many of our members had a personal acquaintance, while the fame of the latter was not confined to our own shores. What man interested in photography is there who has not heard of Hunt's *Researches on Light*? Nor is his *Manual of Photography* to be reckoned as worthy of less notice than the *Researches*. True, it has been superseded by other treatises and other manuals, but this has been due to the progressive nature of our art. This manual went through many editions, and it is interesting to note that the publishers were a Glasgow firm, Richard Griffin & Co., and formed a volume of the *Encyclopædia Metropolitana*. A copy of the two works in question lies on the table, as also two others from Hunt's pen, *Panthea*, the *Spirit of Nature*, and *The Poetry of Science*. The later editions of Ure's *Dictionary of Arts, Manufactures, and Mines* were edited with Hunt's name attached. Hunt for many years has not identified himself with matters photographic. That the work he has done still bears good fruit, I may perhaps be permitted to state the fact that while at Vienna Dr. Elder mentioned to me that although he had access to Hunt's *Researches on Light* in one of the public libraries in Vienna, he had not so far secured a copy for himself. I told him that on my return to Glasgow I would be able to put this right, and accordingly, having picked up a copy at a second-hand bookshop, I posted it to him without delay. One word more regarding the *Researches* and I am done, and it is this, that there is no work in our own or any other language that is so full of suggestive material for the photographic experimentalist, and that, although it is now thirty-three years since the first edition was published, much of the original matter therein brought forward by the author has never further been added to. It may not be without interest to state that at the first meeting of the first Photographic Society in Glasgow, with the late Sheriff Bell in the chair, Hunt was present. The date of this meeting was March 8, 1854, on which occasion the late Jabez Hughes read a paper on *The Prospects and Progress of Photography*. All the information I have on the subject regarding Hunt's part in the proceedings of that evening's programme is that he addressed the meeting. Are there any members present who can further enlighten us?

Before passing on to the more immediate subject matter of my communication this evening, perhaps I may be allowed to refer for a moment or two to those classical researches of Carey Lea's which have been published during the term of our recess; nor do I purpose taking up your time by going into the production of the coloured compounds to which Lea has given the name of photo-chloride, photo-iodide, and photo-bromide of silver (it will be within your recollection I discoursed on these in my paper at the Convention), but simply to refer to a later communication in which Carey Lea described what he called "image transference." This consisted in taking paper covered with a salt of silver, other than a haloid salt, say a tartrate, and exposing to light, and afterwards in the dark room applying a solution of hydrochloric or hydrobromic acid, then a solution of dilute nitric acid, to be followed by washing. On applying the developer the effect produced by light in the first instance was made manifest. I have always been expecting to see some English experimentalist going into these matters, and giving us some further insight into these unlooked for phenomena. Another most interesting experiment brought forward by Carey Lea for the first time is that of the application of a solution of sodium hypophosphite which works the same change upon a silver haloid, giving a developable image exactly as if the salt had been exposed to the impact of light. It has been ascertained that this salt in question acts in no way as a developer, and the outcome of the whole of Lea's work may be briefly set down as an attempt (and I think a successful one) to establish the identity of what is known as the latent image with the coloured photographic compounds, produced in quantity by the various methods detailed in the original memoir. These researches have opened up a fresh field for those interested in the photo-chemistry of our art, and whether practical applications may or may not follow in their wake, the American investigator is entitled to receive from the hands of an Association such as ours a full recognition of the good work done.

At the close of the address he handed round a detective camera of foreign make for going inside the vest, the lens protruding through a buttonhole, and being provided with a shutter for snap shots.

The CHAIRMAN, in proposing a vote of thanks to Mr. Lang, said they were greatly indebted to him for the very vivid description which he had given them of his tour and the many fine specimens of photo-mechanical work he had brought back with him and which had been placed before the meeting.

Through the kindness of Mrs. Baden-Pritchard, the first picture procured by the action of light by Niepce was handed round. This picture, done in 1827, had been brought by Niepce to this country to illustrate his paper read before the Royal Society, and had been presented by him to the Secretary of

the Royal Society, and after a time had fallen to the late Mr. Baden-Pritchard at an auction sale.

The original memoir of Niepee that had been read at the same time when the picture was exhibited was also handed round, and, after the members had examined both, a hearty vote of thanks was accorded Mrs. Baden-Pritchard for her kindness in allowing this interesting relic to be exhibited.

There being no other business, the Chairman intimated that a popular meeting would be held on the 10th instant, when Mr. Armstrong would lecture; and, after a vote of thanks to the Chairman, the meeting separated.

CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

THE November meeting of the above Society was held on Friday, the 11th instant, at headquarters.—The President, Mr. S. W. Allen, in the chair.

The following gentlemen were elected ordinary members:—Messrs. Horton, Travers, F. Thomas, and W. H. Thomas.

A communication was read from the Town Clerk *re* National Institute for Wales, and Messrs. Allen and Kellar were deputed to watch the interests of the Society.

The second annual meeting was afterwards held and largely attended.

The report as presented was taken as read, received and adopted.

The officers for the ensuing year were elected as follows:—*President*: Mr. Alexander Kellar.—*Vice-Presidents*: Messrs. H. Dyer and S. W. Allen.—*Hon. Treasurer*: Mr. G. H. Wills, jun.—*Hon. Secretary*: Mr. G. H. Bedford.

A private exhibition was also held, and although short notice had been given, a most interesting collection was brought together, embracing all the different processes. A chief feature was the enlargements shown, many of these being extremely well executed.

Although not definitely decided upon, we understand either a public exhibition or *conversazione* will shortly be held.

A vote of thanks to the Chairman and past officers terminated an agreeable evening.

Correspondence.

Correspondents should never write on both sides of the paper.

PHOTO-MICROGRAPHS AT PALL MALL.

To the Editors.

GENTLEMEN,—There is hardly a line in Mr. Evans's letter to you dated Nov. 4, to which I might not, if so inclined, take exception, not personally but from a scientific point of view. But your space and my time are too limited to justify me in following Mr. Evans specifically into his extraordinary explanations and statements.

Even his first letter in no way offended me personally—if Mr. Evans was not hurt by it certainly I was not; in proof of which I sought and obtained a personal interview with Mr. Evans, not with intent to assault or batter, but to talk matters over in a quiet way. At that interview I told Mr. Evans, as quietly as might be, my opinion of his work, so that I need not say anything about it here.

At this interview I learned that Mr. Evans had not read any of the accepted classics of bacteriology—in other words, that he knows nothing whatever about it. He appears to have read some wonderful book by a Dr. Garth Wilkinson, truly wonderful if it says that inoculation and vaccination “trample upon Nature's safeguards and wisdoms.” But as Mr. Evans confesses himself an unfit receptacle for argument I need not pursue this subject. But I must say some of Mr. Evans's assertions (as that bacteria “are only found in the later stages of disease”) are fairly dogmatic for one who confesses to know nothing of such matters, as he does in his letter by implication and did to me directly.

There was no covert detraction in Mr. Evans's statement that my prints would make fine “decorative designs.” It was good plain English.

If there is one thing to be avoided above all others in photo-micrography it is the attempt to make “pretty pictures”—“a love of the beautiful and artistic,” as Mr. Evans puts it. The beautiful and artistic in this sense may be found elsewhere, and may be as easily rendered by ordinary photography as by micro-photography, with much less risk of doing harm by misrepresentation. One of the first lessons the photo-micrographer has to learn is to dismiss all thoughts of pictorial effect.

Of course, if Mr. Evans's only object in writing his first letter was not to make invidious comparisons between his work and mine, but only to draw me out in a jocular letter, then I am pleased to note that in his flattering opinion he succeeded. As he can blush to his very soul no doubt he can also laugh in his very *tendo Achillis*.

I do not propose to continue this discussion. Mr. Evans got his medal, and I hope he will do it again. I got mine, and I hope that my work may be greatly improved before next Pall Mall Show.—I am, yours, &c.,

ANDREW PRINGLE.

Bealys Heath, November 12, 1887.

BACTERIOLOGY.

To the Editors.

GENTLEMEN,—As the subject of bacteriology has been introduced into your columns, you will, perhaps, allow me to add a word or two which

shall be strictly matter of fact, and shall not deal with disputed matters, though it can hardly be said to have any direct bearing on photography. Mr. Evans appears to me to abandon an entrenchment which is well capable of scientific defence, and the question which he opens can only be permanently decided on the grounds of scientific fact, and by the assistance of that bacteriology which he contemns. It is now undisputed that the protection against smallpox given by vaccination is much less absolute than was supposed by Dr. Jenner, while careful analysis of statistics has shown that some of those which appeared strongest in its favour were really influenced by other causes. It is equally undisputed that vaccine inoculation may be the means of communicating more serious diseases; and even calf-lymph is in this respect not above suspicion. The ready communication of tubercular disease by accidental inoculation (see Klein, *Micro-organisms and Disease*, third edition, p. 218), is also matter for serious consideration. The point, then, for discussion is whether the degree of protection obtained is worth the risk incurred, and especially whether the balance in its favour is so clear as to justify the interference with personal liberty involved in compulsory vaccination.

With regard to Pasteur, all who have studied his work in other directions than that of rabies, while they must recognise his splendid genius and brilliant experimenting, are bound to regret a certain precipitancy in accepting conclusions which renders him an unsafe guide to follow without mature reflection. His so-called “vaccination” for anthrax has been shown by eminent English bacteriologists to entail greater risks than advantages, and it is gravely suspected by many that the same is true of his latest discovery.—I am, yours, &c.,

Tynemouth, November 13, 1887.

HENRY R. PROCTER.

SULPHUR AND GELATINO-BROMIDE PRINTS.

To the Editors.

GENTLEMEN,—On page 692 of your present volume you insist on the absolute necessity of elimination of acid before fixing gelatino-bromide prints to prevent sulphuration. Without questioning the expediency of this on general principles, it seems evident from recent experiments that these prints are very differently affected by sulphur to those on albumenised paper. I may also draw your attention to the opinion on sulphur-toning of these prints (*Instruction in Photography*, fifth edition, p. 191), expressed by Captain Abney, who says, “It is the organic compound of silver which gives rise to fading, and not the sulphuration of the metallic silver. Sulphide of silver is about as permanent a silver compound as can exist, and there can be no danger of its fading.” Where such eminent “doctors” differ there is clearly some room for inquiry; and from a practical point of view the question is worth settling, as Eastman paper can be toned with sulphide of ammonium to a colour not unlike albumenised paper.—I am, yours, &c.,

HENRY R. PROCTER.

AMATEUR PHOTOGRAPHIC EXHIBITION.

To the Editors.

GENTLEMEN,—In connexion with our Third Annual International Photographic Exhibition it will doubtless interest both your professional and amateur readers to learn that this Company has just paid the sum of 32l. 5s. to Mr. Harland, the Secretary, in aid of the Photographers' Benevolent Association. This consists of the amount received for entrance fees, which were fixed at 2s. 6d.; but as we have sent out some thousands of circulars to amateurs setting forth the aim of the Association, we believe that we have benefited the Society to a far greater extent than the sum actually sent as above.

The exhibition will be open to the public, on presentation of visiting card, on and after December 7, when, although no actual charge will be made for admission, visitors will be invited to place a small contribution in a box that will be provided for the purpose by the Association, and we trust we may thus be able to collect a further goodly sum from amateurs and others.—I am, yours, &c.,

S. M. CLARK, Secretary.

London Stereoscopic and Photographic Company, Limited,

110 and 108, Regent-street, W., and 54, Cheapside, E.C., Nov. 14.

Exchange Column.

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

Wanted, books and periodicals on photography in exchange for other books, apparatus, &c. All letters answered.—Address, HARRISON, Science Laboratory, Icknield-street, Birmingham.

Exchange quarter-plate camera, view lens, double slide, and tripod, complete, for enlarging lantern or burnisher.—Address, E. C., 6, Fore-street, Salcombe, South Devon.

Wanted, stereoscope by Smith & Beck, Dallmeyer, or other good maker, in exchange for photographic apparatus.—Address, W. I. CHADWICK, Brooklands, Manchester.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

PHOTOGRAPH REGISTERED:—

T. Ball, Kidderminster.—Photograph of Kidderminster Jubilee Committee.

J. JONES.—No.

T. C.—The rapid.

J. A. FORREST.—Thanks for enclosure.

HIGH PEAK.—Your letter has been sent to the gentleman named.

SCOTUS.—Yes. Magnesium will answer. Conical form not necessary.

WAX PAPER.—We shall be glad to see you when you are in this quarter.

V. C. YEALLET.—The sulphate of baryta is intended to remain insoluble.

C. E. PEACOCK.—We do not undertake the testing of lenses professionally.

ADOLPHUS.—The spots appear to us to be caused by some defect in the paper.

J. W. COPLEY.—Both your questions will be found fully answered in the forthcoming ALMANAC.

A. G.—The "battery" has been received. Trials will be made and the result published in due time.

HENRY E. DAVIS.—We imagine the gentleman who wrote under that *nom de plume* has left this country.

WM. BISHOP.—We rather think that the Brins's Oxygen Company do not wish to court publicity as regards photographers.

J. D. HUMPHRE.—The roundness of field is not unreasonable. It could be flattened by the separation of the lenses, but we question its advisability.

QUANDARY.—Try the effect of slightly increasing the strength of the fixing bath, although we think the prints ought to be sufficiently fixed by your treatment.

BICHROMATE.—The white spots are caused by not placing the carbon tissue in perfect contact with the paper on which it has been squeezed. Procure the new manual issued recently by the Autotype Company.

A. M. L.—1. Get a larger camera.—2. See an article by Mr. J. Hubert in our issue for February 25 of the present year.—3. We have not had an opportunity of becoming acquainted with the Iris diaphragm of the maker indicated.—4. Two ounces.

W. JONES.—Having decided upon the nature of the lighting as regards its primary and secondary directions, screen out all that militates against this. You will arrive at a solution of the question much better by making a few trials than by all the written or printed instructions in the world.

W. T. Z.—Let the walls of the studio be seven feet high and the slope of the roof an angle sufficient to allow melted snow and rain to run off easily. Commence the glazing three feet from the end. It is better to have too much than too little glass, as the proper amount of light can be easily regulated by blinds or screens.

AJAX.—To remove the old silver from the black cloth trousers is easy enough. Apply first a strong solution of cyanide of potassium followed by a strong solution of iodine in cyanide. But concerning the probable discharging of the dye and the restoration of the spots to their primitive blackness, we are a little uncertain what to advise. The services of a dyer will probably be required.

E. H. EARL inquires: "1. Will you tell me if I can get as good a light for the limelight supposing I fill one bag with coal gas from the gas main instead of pure hydrogen?—2. If not so good, would it be any better than using the oxyacalcium or blow-through jet?"—In reply: 1. Opinions vary. See articles that have appeared on this subject in our columns during the past two years.—2. Very much better.

A. B. C. writes: "I am about to build a studio; would you kindly give me the best size—I can have fourteen feet in width and without limit as to length—giving the size of side and top lights; also where I could procure the blue wings now so much in use for top lights?"—A convenient length for a studio for general work is about thirty feet. Four feet six or five feet at the background end of the roof and side should be opaque; then about twelve feet of glass top and sides will be sufficient; all the rest may be opaque. Any blind-maker will construct the blue wings to your order,

JUSTINIAN.—We do not imagine for a moment that any slur was intended by the writer of the article to be cast upon professional photographers.

W. A. Z. (Amsterdam).—1. By "back focus" is meant the distance between the ground-glass and the surface of the lens next to the ground-glass screen.—2. The lens inquired about will probably be similar to that which you now possess, neither better nor worse.—3. We are not acquainted with either of the shutters named. Both the Grimston shutter and one just brought out by Perken, Son, & Rayment, will fulfil the conditions required.—4. Avoid actinometers when exposing in the field.—5. We do not know what will keep cockroaches away from the leather bellows of a camera when on shipboard.—6. The thicker the plate the more widely spread will halation be. But why not adopt means to prevent halation altogether?—7. Not having tried the Bernaest plates we do not know their rapidity.

** WITH this number we give an engraving of Mr. W. H. Hyslop's medal picture; *The Thistle*.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—Thursday, November 24, will be a lantern evening. Visitors are invited.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, November 23, 1887, will be on *Development*. Mr. B. J. Edwards will demonstrate the working of a new process of development.

THE JENNINGS'S FUND.—The following additional sums have been received:—P. D. R., 10s.; Frederick York, 3l.; A Friend, 1l.; Editors, *W. M. A.*, 2s. 6d.; W. Bedford, 10s. 6d.; K. A. B., 5s.; E. Gail, 10s.; A Friend, 2s. 6d.; John E. Fawcett, 5s.

THE PHOTOGRAPHIC EXHIBITION.—In addition to the exhibits of apparatus already noticed the following were also shown:—A developing portmanteau, G. Houghton & Son; Two cameras and roller slide, S. D. McKellen; Patent roller slide, Morgan & Kidd; The Secret Camera, J. Robinson & Sons; Improved camera, Sands & Hunter; Roller slide and camera, J. E. Thornton; Camera with winding focussing screen, T. Samuels; Portable camera, detective camera, adjustable bamboo and other stands, C. G. Collins; Double band shutters, W. Tylar; New shutter, detective camera, negative book, and camera case, J. F. Shew & Co.; Plate boxes, Arundel & Marshall; Stereoscopic shutter, Reynolds & Branson; Detective camera, J. B. Thistleton; and two of Eastman's new model roll holders, Eastman Dry Plate and Film Company.

A NEW ANTISEPTIC AGENT.—At the last meeting of the Manchester Section of the Society of Chemical Industry Mr. Watson Smith gave some particulars concerning a new antiseptic agent called alpha-oxynaphthoic acid. It was, he said, a body strictly analogous to salicylic acid—in fact, it might be termed the salicylic acid of the naphthalene series. Dr. Von Heyden, of Dresden, had kindly sent him a specimen of the new antiseptic. It consisted of a crystalline powder, free from odour, becoming electrical on friction, and melting with decomposition at 186° C. It had a pungent taste, was sparingly soluble in water. Boiling water only dissolved three-quarters of a gramme per litre. The alkaline and earthy salts were all soluble in water. Experiments had shown that, as regards the effect of solutions, tried side by side with those of salicylic acid of the same strength on solutions of sugar and yeast, the influence of alpha-oxynaphthoic acid as regarded antiseptic power was more than five times stronger than that of salicylic acid. It had, moreover, been found that the new antiseptic was especially powerful in killing certain bacteria and some low forms of animal parasite.—*Brewers' Guardian*.

THE annual dinner of the North London Photographic Society was held on Monday evening in Beal & Co.'s Restaurant, Holloway-road, and was very numerously attended. Mr. J. Traill Taylor, President, occupied the chair. After the toast of the evening, "The North London Society," responded to by Mr. Hedley Smith, Hon. Secretary, the various other societies there represented were duly toasted. These were, the Photographic Society of Great Britain (acknowledged by Mr. W. Bedford), the Photographic Club (Mr. E. Clifton), the London and Provincial Photographic Association (Mr. L. Medland), the Photographers' Benevolent Association (Mr. John Jackson), and the Photographic Convention of the United Kingdom (by Mr. Mackie). The Photographic Press was responded to by the Chairman; and various informal toasts were proposed by Messrs. Humphries, J. Nesbit, and others. The proceedings were enlivened with music and recitations, lasting up to a late hour. A novel feature was introduced, viz., that of making an impromptu collection in aid of the funds of the Photographers' Benevolent Association, and a goodly sum was collected.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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WINTER NEGATIVES.

WE recently dealt with the subject of veiled shadows, a topic which would naturally be embraced by the title of our present article, which has, however, many other aspects. We see a great amount of trouble experienced, and are witness to the production of large numbers of prints of most indifferent character, all of which might be modified, in the direction both of prevention and cure, by a well-thought-out system having regard to the exigencies of the season. The season of frost will soon be upon us, when those beautiful effects of frosted bough and spangled hedgerow form such entrancing subjects for the camera; but in the main winter negatives are devoted to portraiture.

The subject that lies heaviest on the photographer's mind just now is the length of time it takes to execute a commission, and this, coupled with the liability to the production of negatives of indifferent calibre so common to winter photography, is well worthy of consideration so as to arrive at the best way to meet the evil. It is an excellent method of working to endeavour to produce a negative all the year round of as uniform a type as possible; but whereas, in summer, a little extra density does not mean any additional trouble, the slightest increase in light-resisting power in the winter months is fraught with the possibilities of the dragging on of printing operations to an inordinate length of time to obtain a single print. A negative may be put out on a Monday and, in some weather, almost be insufficiently printed on a Saturday. It is then obvious that every step taken to prevent the production of over intensity will be of advantage in winter weather. One little observed, but exceedingly fertile cause of undue strength, lies in ignoring the fact that when a developed negative is judged to have arrived at the correct density, the mere operation of giving it a rinse under the tap and placing it to soak in water is by no means sufficient to keep the intensity at the stage it had arrived at when taken out of the developer. When a large number of negatives are being developed at once with the idea of fixing all in one operation afterwards, it is quite possible to find that, though the utmost care be taken, the last negatives developed are always the weakest, the fact being that though first rinsed and then put to soak in clean water the developing or intensification will continue to progress—at a slow rate, after a time, it is true—almost the whole time the plate is in the washing water. It is therefore obvious that uniformity of results, and the absence of too great an amount of density, may be facilitated by always keeping in view this tendency. As to preventing its action, if the plate be fixed after a slight washing only it is obvious that the evil would be prevented; but many operators object to this plan on account of the rapid darkening of the hypo brought about.

The plan that commends itself to us is one we have before mentioned as being employed by a well-known professional, namely, to place each negative into an acidified alum bath as soon as taken out of the developer and rinsed. The acid neutralises the alkali of the developer, and at once destroys the power of any pyro left in the film to continue in action; added to this is the advantage of having films perfectly colourless and unobstructive of light, so far as the film alone is concerned; so that we are surprised that we do not hear more frequently of the adoption of such a simple arrangement, whose usefulness is by no means restricted to the winter months alone. We are, however, aware that the question of colour is a disputed point.

Then, again, it is quite permissible to make negatives giving excellent prints in winter, but which shall be considered too thin in summer; for the dull light of the present time is just the condition calculated to give good prints from thin negatives, and, after all, it must, we should think, be the case that not more than, perhaps, one out of a dozen winter-taken negatives are wanted for summer printing afterwards; so that it is not objectionable in policy to take them with characteristics best adapted for the time of year they are produced at. As to the physical peculiarities connected with the season, absence of frilling tendencies is a great boon when some brands of plates are employed, though the evil is greatly reduced in frequency and extent nowadays; but this gain is almost counterbalanced by the difficulty experienced in drying the finished negative without the use of methylated spirit, which is both expensive and troublesome. A drying box, such as has been described by many writers in these pages at one time or another, is almost a necessity where time is any object.

We have had brought before us an extremely singular defect brought about solely by the use of spirit in this connexion. A negative was required for instant use, and was put through the usual process; when drying before the fire to expel the last trace of water left from the spirit a peculiar opalescent appearance was left—in certain portions only—in the film, and it materially interfered with the printing. We surmised that the spirit employed must have been used for dissolving the varnish from some negative and the fact have been forgotten. But, upon trying the experiment ourselves with another negative, and with spirit of undoubted purity, the same effect was seen; any doubt as to the shellac idea was set at rest by the fact that the opalescence disappeared if the negative was placed in water. It presented the appearance of some substratum insoluble in spirit but soluble in water having been employed. Be the explanation what it may, the phenomenon was remarkable enough, and the plates could not be used in the circumstance.

Many photographers print from their negatives without first varnishing them; but at this time of the year it is a most dangerous practice, for there is now always more difficulty in getting the daily sensitised paper sufficiently dry, even in fairly well-heated rooms. Add to this the danger of there being condensed atmospheric moisture on the film, or of the hygrometric condition liable to be induced by breathing upon the plate, and it will be seen that it is well worth while going to the trivial expense, and the equally trivial loss of time, involved in varnishing a negative, rather than risk its destruction by the silver paper print adhering to its surface; a silver stain thus produced being, practically, ineradicable. If, however, it be determined to dispense with the use of varnish, the utmost care must be taken to gently heat every negative before placing in the printing frame, and to see that the paper also is well dried; though, here again, excess of caution may cause evil in a contrary direction, paper too thoroughly dried being deficient in printing qualities and incapable of being well toned.

We conclude by saying that it is evident, therefore, that the endeavour to give a special character to winter-made negatives is capable of materially influencing the quality of the work at the same time that it facilitates its production.

RESTORING SOLUTIONS OF PYRO AND SULPHITE.

In our last issue we published a suggestive and useful communication from the pen of Mr. A. P. Higgins on the subject of *The Regeneration of Sulphite-Preserved Pyro Solutions*, and during the few days that have elapsed we have taken the opportunity of testing the method practically.

Solutions of pyro and sulphite are well known to possess excellent keeping qualities, extending, when proper care has been exercised in the first preparation of the solution, to years, but clearly it is unfair to expect that such solutions will remain entirely unchanged for even short periods. Both the pyro itself, as well as its preservative, are unstable compounds prone to oxidation, and, therefore, we must expect some slight change to proceed constantly; but whether the alteration brought about is sufficient to materially affect the developing power of the solution is a question which remains to be answered. We are of opinion that practically it is insufficient to seriously, or even noticeably, interfere with the result, provided, as has already been said, the solution is properly made to commence with; still, in view of the undoubted fact that a change does occur, a method of counteracting any possible ill effects that might accrue must be welcome.

The change brought about by oxidation results, as shown by Mr. Higgins, in the conversion of the sodium sulphite and sulphurous acid employed as preservatives into sodium sulphate and sulphuric acid respectively, the former of which is totally devoid of any preserving power, while both are strong retarders. It is a curious circumstance that so apparently inert or neutral a substance as sodium sulphate should possess such a property, but such is in fact the case, and numerous other salts of a similar character may be included in the same category. The method put forward by Mr. Higgins aims simply at the removal of these newly formed retarding agents, but does not attempt to restore any power that may be lost by the oxidation of the pyro itself; hence we come back again to the proviso that, in order to derive any benefit from the treatment, the solution must have been originally a properly prepared one.

In effecting the removal of the retarding agent, Mr. Higgins avails himself of the well-known affinity of sulphuric acid for

barium, and by treating the solution with barium hydrate converts the acid, both free and in combination, into insoluble, and therefore harmless, barium sulphate, which may be separated by subsidence. Sulphurous acid is then added to reconvert the liberated sodium hydrate into sulphite, and so the solution is restored to its pristine vigour, except for the inevitable oxidation of a small quantity of the original pyro. This, however, is, under favourable conditions, inappreciable.

But an element of danger creeps in in the course of the process, simple though it is, which probably does more permanent injury to the solution—as a keeping solution—than the benefit it confers. The result of the reaction that occurs when barium hydrate is added to the oxidised pyro-sulphite solution is, as Mr. Higgins correctly points out, the formation of barium sulphate, which is probably harmless, and sodium hydrate, which is with equal probability the reverse.

In an editorial article in the ALMANAC for 1885, the comparative effects produced upon a solution of pyrogallol by caustic and carbonated alkalis respectively were pointed out. Pyro, we know, in neutral solution oxidises comparatively slowly, the action being retarded in the presence of an acid, and accelerated, on the other hand, by an alkali, the degree of acceleration depending upon the strength of the alkali. In the caustic state the effective strength is naturally far greater; and, as pointed out in the article referred to, while in the presence of a carbonate the pyro solution oxidises slowly, and at the surface only where in contact with the atmosphere, the caustic alkali causes it to oxidise and discolour evenly throughout its entire volume. In fact, in the one case the atmosphere supplies the oxygen, while in the other the solution carries in itself the germs of deterioration.

Now, it is evident that on treating the pyro-sulphite solution in the manner indicated, soda in the caustic state is liberated, and must necessarily remain in contact with the pyro for some considerable time, as the elimination of the sulphate cannot be performed instantaneously, but requires time and care. Consequently we have during a certain period a rapid oxidation of the solution, which, if it only result in the discolouration and enfeeblement of the developer, is bad enough, though we are strongly of opinion that it goes farther. For instance, we know that a properly prepared pyro-sulphite solution—that is, one which is free from colour, or nearly so at first—will remain in that condition for a practically unlimited period; but should any oxidation occur during the mixing, resulting in a discolouration of the liquid, the fault will go on increasing with time, and the more rapidly in proportion to the extent of the original colouring. Thus it would seem that the mere presence of oxidised pyro tends, if not to set up decomposition, at any rate to aid in its continuance; and it is probable that a solution treated on the Higgins's plan, though not seriously deteriorated at the time, would be found upon keeping to rapidly discolour and lose its strength. Absolute destruction of power, it is needless to say, is an infinitely greater evil than the mere holding in check of a force that still remains in existence.

Such were the reflections that induced us to practically test the method as described, and the results obtained have so far fully borne out the theoretical anticipation. Not having at hand a bad sample of pyro-sulphite solution, a fresh one was made, and to it were purposely added a liberal dose of sodium sulphate and sulphuric acid. It was divided into four portions, which were variously treated, as we shall describe. One portion was first treated by Mr. Higgins's method, neutralised, or rather rendered slightly acid with sulphurous acid, and set

aside for the barium sulphate to subside. When clear the "regenerated" solution was, as we had fully anticipated, very considerably deepened in colour.

Upon trying this side by side with the untreated solution in developing a couple of test plates, the treated portion proved the more energetic of the two at the commencement of the development, though, when the other did commence, it appeared to progress as rapidly as its rival, and at the finish exhibited a decidedly more vigorous image. Several repetitions of the experiment gave the same result, from which we draw the conclusion that the treatment does remove the retarding action of the oxidised sulphites, but that either from the removal of that restraining action, or else the weakening of the developing power of the pyro, the regenerated solution gives a more feeble image than the other.

It is true the conditions of this experiment were not such as actually prevail in the case of an oxidised solution of pyro, but it is difficult to see in what respect they materially differ. At any rate, they are such as to give the regenerating system a thoroughly fair trial, if indeed they do not work slightly in its favour. So far sufficient time has not elapsed to enable us to say whether the treated solution is likely to remain without further deterioration.

Arguing from these results that the liberation of sodium hydrate in the solution is objectionable, we varied the experiment in the following manner. A quantity of freshly precipitated and carefully washed barium carbonate was added to another portion of the solution, thoroughly shaken, acidified, and allowed to subside. Here the theoretical interchange that takes place would result in the formation of barium sulphate and sodium carbonate, the latter being subsequently reconverted into sulphite. Here no discolouration of the solution followed the treatment, and so far theory and practice worked together, but when tested for developing power there was far less difference between the treated and untreated solutions than in the previous experiment. The former acted a little more rapidly, and gave a softer image, but the difference in general behaviour was not such as would, under ordinary circumstances, have attracted any attention. This we do not attribute to inefficiency of the method so much as to want of sufficient time for the full reaction to proceed. The carbonate of barium would be more slowly acted upon by the sulphates than the hydrate, and, in addition, a portion of the liberated carbonic acid would also be absorbed and held in solution to act as a restrainer. By allowing more time we anticipate a more favourable result.

The last experiment, and one which holds out the greatest promise of practical utility, consisted in treating the remaining portion of the solution with barium chloride. A good deal has been written during the past year or more with regard to the value and action of chloride of sodium in the developer; not that the base of the chloride is a matter of vital importance, the sodium salt being selected as being the readiest to hand. If, as many believe—ourselves amongst the number—a soluble chloride is, under certain conditions, beneficial in the developer, and produces little or no slowing effect, it seemed feasible that by adding barium chloride we should at once get rid of the obnoxious sulphates without submitting the solution for however brief a period to any influence at all likely to cause or hasten its deterioration, and in the result we found complete justification.

To the remaining portion of pyro solution we added barium chloride in the proportion of three grains to the grain of pyro,

and simply allowed the precipitate to subside. Upon trying this side by side with the untouched solution, it developed with slightly greater rapidity at the start and progressed with far greater energy, giving an image combining with an equal amount of detail decidedly greater "pluck" and brilliancy and cleaner shadows. In fact, the useless retarder, sulphate of soda, was replaced by a restrainer consisting of soluble chlorides (sodium and barium), which possesses beneficial qualities in addition.

The addition of barium chloride to a properly and newly made pyro-sulphite solution causes only a comparatively slight opalescence, with scarcely any precipitate, properly so called. Indeed, added to a solution which had been made nearly twelve months, the deposit formed was not sufficient to interfere in any way with its immediate use. Thus it seems that the real necessity for this remedy is, perhaps, very slight when the preserved solution has been made with care.

If upon extended trial the use of barium chloride should prove to possess no serious disadvantages, we are disposed to claim for it a decidedly beneficial action. Assuming that chloride in the developer is desirable and useful, we may make up our preserved solution of pyro with barium chloride at the outset, and, rejecting the use of restraining bromide, trust entirely to the chloride for the brilliancy and clearness of development. Then, again, as the solution becomes oxidised, the sulphate or sulphuric acid will at once go to the barium, and in the interchange of elements all that will happen will be the very gradual disappearance of the preservative sulphite and the conversion of a portion of the soluble chloride from the barium to the sodium salt, with the simultaneous deposition of insoluble barium sulphate. If free sulphurous acid be present to commence with, of course a corresponding liberation of hydrochloric acid will follow, and this in the free state may probably not be a desirable adjunct to the developer; but if such should prove to be the case, it is easy to dispense with free acid.

In this manner, it will be seen, we secure a solution which is always in the best condition, and which practically undergoes no change, so far as its developing power is concerned. For the gradual disappearance of the sodium sulphite can only be said to affect the keeping qualities of the solution, and as there appears little reason to doubt these the balance would seem to be in favour of barium chloride.

VERY suddenly, on the 21st inst., died Mr. James Ramage, of Edinburgh. He dropped off his seat without any warning. Mr. Ramage was the manager of the art and illustration department of the printing and publishing business of Thomas Nelson & Sons, which important position he had occupied for over thirty years. In this capacity he employed photography extensively, and initiated many applications of it for book illustration purposes. He was one of the five who organized the Edinburgh Photographic Society. After the process of photo-lithography had been divulged by Osborne of Melbourne, Mr. Ramage was the first in this country to produce results which were admittedly of a high class. As an artist he was very skilful with either brush or pencil.

WE note in the list of lectures and lecturers announced for the forthcoming session of the Society of Arts, Sir Howard Grubb will read a paper on *Telescopes for Stellar Photography*, and another name well-known to photographers, Mr. J. Mayall, jun., is set down in connexion with the subject, *The Modern Microscope*. It goes without saying that the two lecturers will be heard with special attention by photographers, and we may anticipate that Sir Howard Grubb's paper will be of especial interest at the present time, when the preparations for making the great stellar map are so far advanced.

WE recently had detailed to us by a well-known correspondent, an instance of a singular failure of perceptive power which had occurred in his own practice. On a certain day he had developed a large number of negatives in, as he thoroughly believes, his usual manner—development, fixing, and washing, done by the aid of a uniform light, all were carried through in his usual manner; but when he came to examine the finished negatives after drying, he was astonished to find that, with scarcely an exception, they were all far too dense, so much so as to be useless until reduced. He could find no satisfactory mode of accounting for his lack of judgment than to ascribe it to a sudden temporary aberration in his power of judging, for every solution was overhauled and found to be in its normal state. This incident was forcibly recalled to our mind in reading an account of a paper on *Colour Blindness*, by Professor W. Ramsay, read before the Bristol Naturalists' Society. Hitherto it has been usually held that the cause of colour blindness lay in some peculiarity of the retina, which was unable to appreciate certain colours of the spectrum, although quite sensitive to all the others. Professor Ramsay says of cases where the ear cannot separate differing tones of sound, that "it must be concluded that in such a case the brain is the defaulter, and it may equally well be the case that the inability to perceive certain colours is not due to a defect in the instrument of sight—the eye—but to the power of interpreting the impressions conveyed to the brain by the optic nerve." If this is the case, the problem is no longer a physical one—it falls among those with which the mental physiologist has to deal. And it further appears to us that as the power of perception is greatly influenced by the condition of the body, it may well be imagined that the case of our correspondent as quoted above and many others, where discordant opinions exist as to matters of sight in the dark room, may be explained by a similar hypothesis.

MOST amateurs in electrical science, be they photographers or otherwise, have been bitten by the mania of economical electric light production by primary batteries on a large scale, in which the by-products shall be of such value as to prevent loss on account of chemicals. But at a meeting of the Society of Engineers held early this month, a paper by Mr. Perry F. Nursey led to a discussion, in which the ideas above alluded to were shown to be fallacious by no less an authority than Mr. Preece, F.R.S. He said there were few men who had had more experience of the behaviour of primary batteries than he had, and he was sure that any attempt to utilise primary batteries for any such extensive purpose as that of lighting mansions or houses must end in disastrous failure. His experience was that the cost of zinc and acids formed an insignificant fraction of the cost of working batteries; the chief expense was in attending them. In the Post-Office they had some five or six hundred thousand batteries, and where they had so many it must naturally follow that the products were very weighty; but they never yet had paid the cost of collection. It does not, however, follow from this, that for such electric illumination an occasional glow lamp for dark room and one or two other purposes might not be arranged at a very slight cost when the photographer undertook all the working arrangements himself.

THE Instantaneous Process is evidently still a matter of profound belief with the press and the public at large; no considerations of light or depth of focus, or special circumstance or condition, entering into their minds. The instantaneous process is a process for taking instantaneously—what could be simpler? The securing of negatives of objects in rapid motion has been considerably facilitated of late years as regards mechanical contrivances, and really rapid plates are more readily obtainable than once was the case; but, fortunately, or unfortunately, the day has not arrived when the photographer can walk out of his premises, regardless of the strength of light or the positions of objects, walk to any scene or assemblage of moving objects, be they human or otherwise, and secure a set of negatives which shall be sharp in all planes and contain all gradations of tones.

SUCH, however, is the idea apparently held by Mr. Mallock in his now famous letter to the *Times*, where he recommends that instantaneous photographs should be secured of the incidents of riots, or the

physical appearance of political prisoners. There is no doubt that an element of value is to be found in his suggestion, but we doubt whether it could be put to practical use, for it generally happens that when the evidence of the camera would be invaluable the condition governing the circumstances are inimical to instantaneous work.

PROFESSOR HELMHOLTZ has lately been conducting a series of experiments upon the conditions producing the deposition of particles of mist, and they have led him to the deduction that the general accepted theory connected with the name of Aitken affords a partial explanation only. Experimenting with chemically produced mists he showed that a nucleus of some material particle is not a necessity and that the precipitation of mist might be brought about by vibratory influences. It might be thought that long ere now some practical mode of preserving ourselves from the fog and mists so terribly harassing to the photographer might have been discovered but the boon is still in the future. Possibly prevention and not cure will be the only panacea.

THE Cellier Syndicate has now developed into The Photographic Company, Limited, the primary object of which is to acquire the patents of Mr. Cellier and Mr. Parkes, and work the same. Now we are aware that a good deal of dissatisfaction has been expressed by photographers at what they justly considered a misleading statement by the Syndicate named, that theirs was a process of "photographing in natural colours," whereas the colours were actually applied by a brush to each individual print. But on the representations of the photographic press as to the deceptive nature of the distinctive phrase it was at once suppressed, and Mr. Parkes and others of the directors said they were far from having any desire to deceive the public as to the real nature of the process. Still, although by a mistake, as Mr. Parkes informs us, the original misleading announcement certainly did appear up to the last in one London weekly newspaper, and in a modified form it is being perpetuated in the advertisements in the daily papers, in the abridged prospectus advertised being found the words, "Cellier & Parkes' process of photographing in colours." The artistic results are, however, unmitigably excellent. Mr. George Augustus Sala is chairman of the new Company, and other good names are on the directorate. Mr. Vernon Heath also is attached to the Company.

ON THINGS IN GENERAL.

WHAT an excellent opportunity the daily papers have recently been afforded to show their utter incapacity to write half a dozen consecutive sentences on a scientific topic without showing indications of the curse of smattering, for such a strong word is the only one applicable where an overwhelming torrent of words, written with such arrogance as to suggest their being entirely *ex cathedra*, is used to conceal an amount of crass ignorance that is really pitiable. We should like to look up to our "dailies" as responsible authorities on the topics they dilate upon, whereas, as a matter of fact, we find that their usual mode of treatment of a technical subject indicates knowledge of the English language, but worse than ignorance of the subject that language is made use of apparently to elucidate. Talleyrand said that the use of language was to conceal thoughts; if he lived nowadays he would say it was to conceal want of thought. Look, for example, at the criticism of the *Builder* on Mr. Sawyer's picture in the late Pall Mall Exhibition, of two fond parents playing with their offspring. Any one who ever saw a baby could tell that the baby in the picture was an undersized dummy, yet the critic here anxious to show his knowledge of "art," heaven save the mark! must needs decry the pretty part of the picture, the (assumed) parents pleasantly toying with their baby, and praise the pinned-up, be-shawled bundle doing duty as a human being of immature age, describing it as "capital, and worth the attention of a painter!"

But such a *fiasco* of criticism as this pales into insignificance when compared with the remarks brought about by a letter in the *Times* from Mr. W. H. Mallock, suggesting the use of instantaneous photography at political meetings, &c. We were lately dosed *ad nauseam*.

with wonderful treatises upon photography in colours, till the bubble burst, as per usual, and now the instantaneous process is having its turn. The *Daily Telegraph* wishes to know when "the art of focussing will be brought to perfection," and, pending the acquisition of the necessary knowledge, discusses the "purposes of utility to which photography, even as we possess it in its existent infantile form, may be adapted." Photographers of late years have come to look upon photography as a very lusty infant. "The indispensable condition to the graphic success of an instantaneous photograph is the entire immobility of the object focussed." So says this interesting paper. One wonders, in turn, what the use of instantaneous work can be under these conditions. Space is lacking to continue these quotations. I advise all my readers to obtain the original article and read it through, it will well repay perusal. I must make an exception with regard to this present writer and his knowledge of English, he speaks of Mr. Mallock's "inchoate" suggestions, evidently under the impression that the word has some resemblance in meaning as it has in spelling to incoherent. I need not say that the word as used is simply nonsense.

I am driven also to wonder how it is when people begin to write on the "ten per cent. system," they are almost certain to make some absurd mistake or other before they dismiss their subject. The Editors have shown up several mistakes of the kind, and I see in the early part of the month a letter from Manchester from a writer who has been "looking the subject up." He depicts specific gravity "as the weight of a unit of volume;" this really, in a letter bristling with figures, cannot be passed by. Specific gravity is a ratio and not a weight. He evidently has "density" and not specific gravity in his mind, in which case he might have been still more precise, and used the word, "mass" for "weight." Again, in his wonderful exactitude he applies a correction for water at 14° C., stating it to be less than 1.0. In this country, Acts of Parliament dealing with specific gravity recognise 60° Fahr. as the standard temperature at which water is 1.0 s.g., whence it follows that the correction is wrong, unless he shows that Carius took another temperature as his standard.

In penning my remarks upon photo-micrography in my last letter, I was most careful not to allude to the remarks of Mr. F. H. Evans in regard to M. Pasteur. I considered them idle, misleading, and unjust but seeing the Editors have opened their columns to the anti-vaccinationists, I feel there is less need for reserve, though I don't see how photography is to gain by discussing the question, except the Editors, as I shrewdly suspect, intend to close that correspondence by giving it a little "law," and then telling the disputants to go and photograph the various bacilli engaged in the operation, and afterwards to "come again."

I see that at a meeting of the London and Provincial Photographic Association there was a remark made by the chairman that a member desired to call attention to a statement about an alleged rainbow photograph shown at some London photographic society's meeting. There is no doubt that the photograph alluded to was one shown at a previous meeting of this Association. I remember being struck with the droll aspect of the question as to whether it was a rainbow or a rope that was photographed, the difference being so slight between the appearances of the two objects. I could not gather whether doubt was thrown on the possibility of photographing a rainbow at all or not. Perhaps the American paper remembered Professor Tyndall's stating that the reflection of a rainbow could not be seen in the water, and so judged it could not be photographed either. If this was the case he might, by referring to Professor Tyndall's foot-note to the published account of the lecture, have discovered that the Professor explained his statement away by saying it was another rainbow and not the one seen above the water that was reflected in it.

I quite agree with the spirit of the Editors' remarks in regard to the opal plaques now so freely being sold by the stationers and others. Some little time ago, when I was giving my opinion about them to a stationer who sold them, he replied, "Oh, they will wash easily with a little soap and water." It is easy to imagine what they would be like after a few washings with soap and water, especially if followed by a dry rub with a towel.

With regard to the elaborate instructions given on page 731 as to the restoration to its pristine condition of the sulphite of soda changed by the action of air, I am inclined to ask, *Cui bono?* If only the

writer would inform us how to recuperate the pyro of a developer, I think we might be quite content to disregard the possible restraining action of the sulphite converted into sulphate. FRANK LANCE.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

HAVING successfully treated the picture so far, we have only the background to finish, and our task will be complete. Many people who do not give the matter sufficient thought may think this a very unimportant point, but I beg to tell such as hold this opinion that it is not so. On the contrary, it is a very difficult portion of a picture, if we are desirous to give it the value that it really deserves. A badly treated background may and will spoil our picture, while a skilfully treated one will undoubtedly enhance our work. Therefore, I recommend giving our attention to a few of the essentials for its successful treatment.

Needless to say the treatment of a background in natural colours demands great judgment as well as artistic skill in its painting. In monochrome our efforts are limited, nevertheless a great deal can be done to enhance the effect of our picture. It is the successful treatment of the background, be it in natural colours or monochrome, which will produce the effect of a harmonious whole in our picture. By its aid we can blend extremes of light and shade, which otherwise would be hard and inartistic, so that they become harmonious, and thus secure the balance necessary to a successful picture. By judicious contrast we can heighten or lessen effects which left to themselves would be glaring defects. Of course in cases where the portraits are what is called *vignetted* there is but little scope for the special treatment of the background, so these remarks will mostly apply to cases where it is desired to make not only a successful *likeness* but a pleasant *picture*. Many of our greatest artists looked upon the painting of a successful background as the most crucial test of ability. Indeed, if I remember rightly, I believe Sir Joshua Reynolds is credited with having declared, "I let my pupils paint draperies and accessories, but the background I paint myself." Thus this great artist, having more or less completed the painting of the *flesh*, allowed his pupils to treat the draperies, &c., but reserved to himself the putting in of the background. If this were the case with Sir Joshua Reynolds, I think we may take it as granted that the backgrounds of our pictures are well deserving of our greatest attention.

Whatever relief your figure may require can be amply supplied by a really good background. According to the lighting of your model, you place in contrast a light here and a dark there, which will in every way be complementary to it and heighten its general effect. It should never be too even in tone, and always of a tint in harmony with your subject. The general tone of your background should not be so dark as your deepest shadows, but yet of sufficient depth to enhance the value and effectiveness of your lights. A very great object to be attained in a good background is *atmosphere*; indeed, without this quality you cannot say you have secured a good background. I had a very strange experience some few years ago which will, I feel sure, give a very palpable proof of the powerful influence a background will have on a picture. I gave the painting of two portraits to an artist upon whose work I could thoroughly depend, and who was especially noted for the beauty and effectiveness of his backgrounds. The portraits were on kit-cat canvases, showing head and shoulders life-size. In due course they were completed, and I was invited to see them at his studio. Now, they were most successful in every way as paintings, yet they would never do as a pair of companion portraits. This may seem very strange, after saying that they were successful as paintings. But it is very easy to explain it.

As individual pictures, they were in all ways satisfactory from a painter's point, yet they were perfectly impossible as companions. Why? Well, because they did not appear the same size; and this fact so impressed me that I actually measured the canvases to "make assurance doubly sure." I asked the artist if anything struck him as being strange, but being used to them I suppose he did not see it. I said they would never do, to which he replied that he would like to know what is wrong with them. I replied that they were not the same size. To this, his reply was that "they must be; besides, you

* Continued from page 709.

have only measured them this moment." I then drew his attention to the painting of the backgrounds—that there was much more indication of space and atmosphere in one than there was in the other. The moment I said this he realised the fact, and was astonished at the difference, and offered to at once alter the background, which he did, and made them both match. This shows how much a picture can be influenced by a background. If I sent these pictures away they would never look the same size when against the wall. One really looked double the size of the other. They were both beautifully painted, but one had greater *breadth*, and gave the idea of greater space than the other, and the eye could never be brought to believe them companion pictures.

The general arrangement of a plain background is such as will bring its darker portions against the lighter ones of the figure, and *vice versa*. As you descend towards the lower portions of the picture the general tone will deepen and the outline of the figure will become less distinct, and partly appear to melt into and blend with it. All the outlines must be softened, and care taken so that the figure may not present the most objectionable appearance of being cut out or, as it were, inlaid. It may be laid down as a general rule, that the fewer objects or accessories introduced into a background the better, and when introduced they should be put in very broadly, avoiding too much sharpness or detail.

As the background should always be painted with the object of setting off the figure, the system of treatment should be somewhat of a bolder or broader nature, in order to add to the greater delicacy of touch employed in the face and other parts of the subject. Put in all backgrounds, as far as possible, with washes and broad hatching, studiously avoiding all approach to small or niggling work.

Now, if we carefully examine our picture, we will find that there is a something wanting; in fact, there is a general lack of finish. It is true we have secured more firmly all the features and other markings of our photograph as regards the face, &c.; we have also washed in the draperies, giving them depth and richness, emphasised and strengthened the folds, and secured a certain degree of relief, light, and shade, and a feeling of atmosphere in the background; but still, there is a lack of finish. This is only natural. The face (which appeared completely finished when compared with the untouched background), now that all parts have been advanced to a certain degree of greater finish, will require a little more work to restore its importance and effect. We must, therefore, proceed to soften by stippling, or other means that may appear more suitable, all lines that may appear harsh or otherwise offensive to the eye. The various shadows here and there may require intensity; these, where necessary, must be treated. Lights which at first appeared strong enough, may be found weak; they must be forced into greater prominence, and many half tones may require *picking out*, which may be done by using a clean brush, just slightly moistened to remove the superfluous colour, or in cases where colour may not have been used, the eraser must be employed.

In the first instance we may be said to have worked each part in detail, but having done so our efforts must now be directed to secure a general harmony in our picture. We must now look over every feature or marking in the face, and give it its relative value as a whole, and not as a part as before. We must also treat the lines and markings (landmarks as it were of time) with great care, in order to preserve them sufficiently to secure the character of the face, yet at the same time to keep them subdued, in order to produce a *pleasing* as well as a true portrait.

Having so treated the face, proceed to finish off the draperies and background in like manner, stippling when advantageous, but more generally hatching, and so softening every part until you feel that nothing more is likely to improve your work.

The general rules which must guide us in working upon all the materials I have before mentioned are the same. Of course the different materials used may demand slight modifications of treatment, but the general idea remains unaltered.

For the treatment of Woodburytypes and carbon prints generally, whether on opal or paper, a slight sizing will be found advantageous at starting. If carefully looked over, after this, there will no doubt be many dark spots visible, which must necessarily be removed. This is an easy matter. Take your eraser or scraper (which latter, by-the-

by, must always be very sharp), and remove these blemishes. Great care must be taken not to cut the surface of the paper, but carefully to scrape off the spot, which really only lies on the surface. The sharper your scraper is the more surely and easily it will work, and I advise having a good oilstone constantly by you, so as to keep this useful little instrument in good working order. Naturally with so fine an edge the least thing will spoil it, but a few touches on the stone will restore its edge, and always keep it in an effective state.

In this manner we go ahead with the various features and general strengthening, adhering to the rules laid down. Often we will have to work upon over printed and very dark carbons, but this will not always be a disadvantage. In such a case we must, with the help of some finely-powdered pumice-stone, reduce such shadows as are too heavy. This is done by rubbing the pumice-stone with the finger (adopting a circular motion in so doing) over the places requiring lightening. Should you, however, require any lights more distinctly marked they must be put in with the ink-eraser as before described. The background, if too dark, can also be treated in like manner. Either the scraper or the eraser may be used with great effect, either to secure the appearance of hatching, or even the suggestion of a pattern may be put in. If this should be necessary or advisable it would be best done *before* sizing.

Very beautiful results can be gained, on carbon base, by the use of the scraper, but a good knowledge of drawing is necessary to ensure success. It partakes much of the style and quality of mezzotint engraving, and the best scraper would be one used by engravers, as it is made of best steel, and will take an exceedingly fine edge.

An ordinary carbon has a fairly glossy surface somewhat resembling the ordinary photograph. It will be found, therefore, very advantageous to use a little gum water with the colour, in order to match the natural gloss of the carbon. Let your brush be only moderately filled with colour when working. The size of the brush you use should be to an extent governed by the size of the picture. High lights are best put in with a scraper or eraser rather than by the aid of Chinese white, as the general effect will prove much more harmonious.

REDMOND BARRETT.

(To be continued.)

PINHOLE PHOTOGRAPHY.

[A Communication to the Edinburgh Photographic Society.]

A GOOD deal of interest has been taken of late in pinhole photography, considerable attention having been bestowed upon it in France, and afterwards among photographers in this country. There have been so many and varied opinions about it that, having myself tried it occasionally, I thought it would not be out of place to say a few words about it here, narrating my own experience. I daresay it is needless to explain what is meant by pinhole photography, but as I have met a few who have not only never seen a pinhole photograph, but do not know how they are produced, it may be well to say that pinhole photographs are taken by means of a minute hole in a metal plate without the aid of any lens. There is nothing new in this. It is just an example of another of those things which come to the surface now and again—new, perhaps, to a new generation, but well known to those of larger experience.

I think I have seen it stated that an aperture of one-eightieth of an inch is the smallest which can be used effectively with a lens. With a pinhole, however, the aperture may, I think, be much smaller.

The camera I used is a rough pine box firmly screwed together, with a hinged door at the back. It is large enough to take a 5×4 plate. The plate lies in a rebate, screwed on all round inside about half an inch from the door, and after the plate is put in I place upon it a piece of paper larger than the box and shut down the door, which is held close by two spring clips. The paper effectually prevents the access of light. The camera, as I originally made it, was four and a half inches in length from the pinhole to the plate, and thus gave upon a 5×4 plate an angular image of about 60°. I have, however, shortened the camera to three inches, which now gives me an angular picture of over 70°, and so includes more subject. The front of the camera has a hole bored in it by a one-inch centre bit, and over this hole is screwed a piece of thin zinc about two inches square. In the centre of this zinc plate I countersink by a small drill a portion of the zinc, and then by a gentle tap drive the point of a needle through the thin portion in the centre. A movable piece of zinc swinging on a pin in front acts as a shutter, which can be held in place over the whole

by means of a small screw through its lower end. I pass the camera round that you may all see it.

It has been said that to get good pinhole photographs you must have very excellent apparatus. I have not found it so. You will see that no camera could be simpler or made in a more inexpensive way, and yet you may get good photographs by its means. The pinhole which is in the zinc on the camera you now see is forty-eight one-hundredths of an inch in diameter—much larger than what I should recommend. I measured it only a few days ago, and thought it had been smaller; yet, with a hole of that size, very fair results can be obtained.

The good qualities of a pinhole camera are many:—1. The first and chiefest of all is its cheapness. Anyone with the least ingenuity may make one for a few pence, and produce with it photographs at least equal to the production of many who use expensive apparatus. 2. There is no lens required, no stops to lose, and no glass about it to break, except the sensitive plate, which may be so well-cushioned as to be also well-nigh unbreakable. 3. Another very important quality, and one which is of very great importance, is the fact that there is no distortion in the picture, every line being rendered as straight and true as in nature. The pinhole camera ought in this way to be of very great use to artists and others who wish to paint scenes which embrace architectural subjects. What can be so simple and easy as to place a pinhole camera in front of any building, and by a short exposure and a little trouble obtain a photograph in which every line of the building is rendered by the very best rectilinear lens ever conceived, perfectly straight and true and in true perspective? 4. Another good quality of the pinhole is, that there is no focussing required. Everything which the pinhole sees is in perfect focus—both near objects and distant ones. You may be standing beside a wall which will be rendered as sharp as the pinhole can, and so also will the spire of a distant church, or the sign of a shopkeeper a hundred yards away. 5. Any amount of subject may be got on the plate of a pinhole camera, according to the length of the camera, or the distance of the pinhole from the plate. It is not advisable, however, to shorten this distance too much for the size of plate used. I have mentioned that I used one giving an angle on the plate of about 60°. This appears to be about the best limit, and gives the best results. If this angular aperture is exceeded, the difficulty is increased in getting the margin of the plate sufficiently lighted to develop evenly. You may see this very well exemplified by means of a ring or hoop. Those sitting directly in front can utilise the whole aperture, while those sitting towards the side fail to see the hoop as a circle, but more as an ellipse. Every plate, however thin we may make it, having a hole in it, acts much in the same way, and stops a considerable amount of the marginal rays.

W. FORGAN.

THE PLATINOTYPE PROCESS.

[A Communication to the North London Photographic Society.]

I do not purpose this evening detaining you with a history, interesting though it may be, of the experiments made by noted chemists over half a century ago—experiments which are, I suppose, considered to be the germs from which this process has resulted—but rather to endeavour to give an outline, at least, of the process, and my remarks will be addressed, therefore, more especially to those who are unacquainted with it. I propose, at the close of my paper, to illustrate some of my remarks by practical demonstration. The platinotype process was invented by Mr. William Willis, jun., and is the subject of three patents; but it is with the third and improved patent that I shall deal to-night. These patents are in the hands of the Platinotype Company, and a license is necessary to work the process. I will pass round mine, so that you may see it is not a formidable document.

The ordinary paper supplied by the Platinotype Company is ready-coated or sensitised on one side with a mixture stated to consist of ferric oxalate and chloroplatinite of potassium, and this surface presents prior to exposure to affecting light a lemon-yellow colour. During exposure under a vigorous negative, the parts acted upon by light become a pale, greyish brown tint, and if the action be allowed to continue the colour will gradually change to a dull orange. The ferric oxalate has been reduced to ferrous oxalate by the action of light, carbonic acid being set free. The print can now be developed by flotation, face downwards, upon a hot solution of potassic oxalate, which dissolves the ferrous image, the platinum salt is reduced, and a picture in metallic platinum black remains, a substance most durable, acted upon by aqua regia alone, and quite immutable by atmospheric influence. The print is then immersed in acid baths, followed by a wash in water. Such is an outline of this simple process. Practically speaking, daylight is necessary to print by. Printing has been conducted by other means, such as electric light, at present out of the reach of the ordinary worker. The paper prints

rapidly—it is said, three times as quickly as ordinary silver paper, and the rapidity in comparison with silver is more noticeable at this time of the year, when the light is less rich in the violet rays, which have a great effect upon the silver and but little on the sensitive salts of platinotype paper.

Development of the print should be done in subdued daylight, or by gas or lamp light, and numerous substances in solution can be used for the purpose. It has been pointed out that simple cold water will act upon the ferrous oxalate, of which the printed image is largely composed, and this will reduce slowly and partially the platinum salt; but I have not obtained good results by this method. What is wanted is a substance which will increase the action of the ferrous oxalate, and a hot solution of potassic oxalate has been recommended as the best for this purpose. The stock solution for the bath is made up as follows:—

Potassic oxalate	16 ounces.
Hot water	54 "

The Company state that this solution must not have an acid reaction. I may say that, although I gave the neutral bath a fair trial, I found, as I believe others have done also, that by acidifying it with oxalic acid the results were more brilliant and satisfactory.

The normal temperature for the bath is 170° Fahr., although a higher temperature must be used for under-exposed prints, and a lower one for those over printed; indeed, in the case of a very considerable over exposure, a cool, if not cold, bath is, I think, a necessity, and the only way I know of obtaining a passable result. The higher the temperature of the developer the more rapid will be the action of the platinum and iron salts upon one another. In development upon a cool bath the chemical action is weakened, and before reaction takes place a part of the materials which would have helped to form the picture are dissolved into the developing bath, and a less vigorous, less rich print is the result. I would recommend a beginner in platinotype to fully expose, that is, have all details of the picture visibly printed out, and to develop upon a hot bath. The development in this case will be completed in a very few seconds. I am, however, aware that many experienced workers do not aim at such brilliancy as this will give, but prefer a cooler bath and different, perhaps softer, results. It really must rest with individual experience, judgment, and taste, to determine beforehand, from examination of a negative suitable for printing with the ready prepared paper, what style of print will suit the subject best; exposure and development are then regulated accordingly.

After development of a batch of prints, the solution is poured back into the stock bottle for use again and again; at the same time, I would point out that this solution must not be over worked. It is, therefore, advisable to keep up the bulk by adding fresh solution to make up for evaporation during developing operations. The bottle containing the stock solution should be either kept in the dark or painted with Bates's varnish.

Immediately each of a batch of prints is developed, it is immersed in a bath of hydrochloric acid—one part acid, eighty parts water—for, say, ten minutes, then into a second bath of same strength for another ten minutes, and again into a third. The object of these baths is to remove from the paper all iron and other salts, and leave only the platinum forming the picture, and the operation must be thorough. It will generally be found that after the prints have been passed through these clearing solutions, that the first and second bath will show a yellow tinge, but the colour of the third bath remains unchanged. Should the third bath show any discolouration, a fourth must be used, and so on. The prints are now removed from the final acid bath and washed in changes of water for, say, twenty minutes to eliminate all acid from the paper; they are then dried and can be mounted.

The question is often asked, "Are not very dense negatives required to give best results in platinotype?" My answer is, that the Company offers to the licensee the opportunity of purchasing from them the materials for sensitising purposes, and that the relative proportions of the constituents can be so varied as to give a sensitised surface to suit, I believe, almost any negative. I am told few workers in this country avail themselves of the offer, and it is not advisable for beginners, for obvious reasons, to sensitise for themselves, but rather to use the ready coated paper, which will be found to suit a sparkling negative, one not necessarily intense, but showing nicely graduated contrasts. The negatives I usually print from received full exposure and were developed slowly. It is said that negatives showing really fine gradation should yield prints exhibiting all the range of tone between a deep black and a clean white. At the same time, I would point out that good results are to be got from negatives of a different character.

The sensitised paper is said to keep in its best condition for a period

of about two months; but it must not, therefore, be assumed that paper of greater age will not yield good results, in fact, it has been recommended that better prints are to be obtained on old paper in cases where very dense or hard negatives with great contrasts have to be employed. My own experience corroborates this, working with paper at least six months old, cool developer used. I was lately shown some excellent results obtained by cold development on paper a year old, and recent experiments made lead one to hope that there is a possible future for old, and even light-fogged, paper. But there is at present an uncertainty regarding the behaviour of old paper which renders its use undesirable.

Great attention must be paid to the fact that damp is fatal to platinotype paper. I refer not merely to the dampness which is apparent, but also to that which is present in the atmosphere during our driest weather. The precautions to be taken are these: The paper must be stored in suitable cases; the metal ones supplied by the Company are made with a perforated chamber at one end, containing chloride of calcium, for the purpose of absorbing moisture which may be present, and, further, the joints of the cases are protected by india-rubber bands to prevent the entrance of moist air. The chloride of calcium on becoming damp must be heated over a clear fire until the moisture is driven off, when it is again packed in the chamber. A sheet of indiarubber must be placed on the back of the paper before the printing frame is closed.

In damp weather, I always, prior to printing operations, dry my frames and warm my negatives before a fire. A damp print on development will give an image wanting in vigour, and generally foggy and unpleasant in appearance. I may mention that prints can be obtained of a sepia tone by using the Company's "Special Sepia Paper" and adding a special solution to the developer; also that various substances, such as wood, tiles, and textile fabrics, can be sensitised and printed upon. The more noticeable advantages of the process are—general simplicity of manipulation; the small quantity of apparatus and chemicals required for working; and the great sensitiveness of the paper as compared with silver. Moreover, undoubted permanence is claimed for the results.

The Company will supply full printed instructions for working the process, and containing the explanation of many minor details not mentioned by me; and I would recommend those who wish to dive deeper into the particulars of platinum printing to carefully peruse the interesting little work on Platinotype by Pizzighelli and Hnbl, published by Harrison & Sons, Pall Mall. To the above-mentioned excellent publications I am indebted for much of the matter in my paper.

In conclusion, it is scarcely necessary for me to speak of the true charm and beauty of artistic prints in platinotype; this is already well known and appreciated. I cannot help thinking that a large number of photographers, frequenters of the various photographic exhibitions, within quite recent years especially—photographers whose partiality lay in the direction of the colour and glaze of a silver print—have gradually, perhaps sometimes unconsciously, yet surely, been educated in favour of tones, subdued—may I add more refined?—whether in platinum or photographic processes giving tones similar. Whether or not these are now to be counted in the increasing ranks of platinotype printers, I leave you to draw your inferences from the fact that many whose names at least, I venture to say, are familiar to all of us present on account of their artistic photographic achievements, are now exhibiting their choice works done in this process.

FRED. W. COX.

A SIMPLE METHOD OF MAKING INSTANTANEOUS PORTRAITS AND OTHER PHOTOGRAPHS AT NIGHT.

[Read before the Society of Amateur Photographers of New York.]

PORTRAITURE by artificial light resolves itself into the employment of gas, kerosene, electricity, calcium, or magnesium. With an abundance of either gas or kerosene quite satisfactory portraits may be made with an exposure of from one to three minutes, if care be taken in the arrangement of the lights, reflectors, &c. With the electric light exposure may be very much shortened, and portraiture by this means has already been placed on a commercial basis. The calcium light is also capable of being used for portraiture, but the apparatus employed is bulky, expensive, and troublesome, and the results obtained are not sufficiently satisfactory to bring this method into use. Exposure required by the calcium light is longer than in ordinary daylight gallery work.

The intensely actinic light yielded by burning magnesium has been utilised experimentally, but not commercially, and has generally been obtained by the ignition of a small length of magnesium tape, either suspended free or fed from a specially constructed lamp. It usually requires an exposure of fifteen or twenty seconds. This method is

unsatisfactory, owing to the fact that the magnesium tape is apt to break and the light go out before the exposure is completed. Powdered magnesium dropped from a funnel upon a burning lamp or other source of heat has not been found in practice to yield the results that were hoped for.

Quite recently Dr. H. W. Vogel has communicated the results obtained by him with the use of a photographic powder prepared by Gädicke. By this means he obtained an instantaneous flash of extreme brilliancy and actinism, and capable of fully impressing the sensitive plate. In other words, he succeeded in making instantaneous portraits at night, a feat which had not been previously accomplished. The exact composition of Gädicke's powder is, we believe, unknown, except to the inventor, but is supposed to be a mixture of magnesium, chlorate of potash, and sulphide of antimony. Commenting on this mixture, THE BRITISH JOURNAL OF PHOTOGRAPHY of August 26 says:—"The statement that it cannot be inflamed by pressure or percussion is difficult to believe, since most dangerous explosions have taken place with such a composition. Of course the materials must be ground separately and mixed gently, but even then, no matter how far the chlorate of potash may be diluted down, so to speak, with the other two substances, the statement that the mixture is safe against pressure and percussion is too serious, as well as too improbable, to be safely accepted on the authority of an anonymous newspaper paragraph." The efficiency of the Gädicke light may be easily conceded, and is sufficiently attested by the eminent Dr. Vogel, and the only drawback to its use appears to be the danger of premature explosion of the powder, a danger that will be fully appreciated by those who are familiar with the behaviour of mixtures containing chlorate of potash.

Experiment has already shown that the light given out by the burning of ten or fifteen grains of magnesium is sufficient to fully expose a sensitive plate, and, with the aid of a quick-acting portrait lens, to yield a satisfactory negative so far as actinic effect is concerned. In using magnesium tape, the ignition takes place gradually, and a time exposure is necessary. For instantaneous exposures it is requisite that the entire quantity of magnesium be ignited simultaneously, so that the full actinism of the light is developed in an instant. This Gädicke has accomplished, but by means which appear to be somewhat hazardous. The problem that remained was to obtain a substance capable of instant combustion, and the heat from which would cause the simultaneous ignition of the magnesium, and which would be free from the dangers incident to the use of chlorate of potash. Such a substance is ordinary gunpowder. If one part of gunpowder be mixed with four parts of magnesium powder, and ignited in an open space, an extremely actinic light is instantly developed. This mixture is absolutely safe, as it cannot be ignited except by the application of fire, and will not explode by concussion.

Another simple method of accomplishing the same end is to take a small tuft of ordinary photographer's cotton, such as is used for making collodion, lay it on a metal plate, and strew over it a small quantity of magnesium powder. The cotton is then lighted with a match, and the heat developed by its combustion ignites the magnesium, and we have an instantaneous blaze sufficiently actinic to effect the desired result, as I will presently demonstrate. It is not for portraits only that the method here described is applicable. Excellent copies of photographs or other objects can be made, and even enlargements on bromide paper. In practice I have found that seven or eight grains of cotton, with from ten to fifteen grains of magnesium, will produce sufficient light for a single portrait or a small group. For copying, lantern slides, or even bromide enlargements, the same quantity may be used.

The methods here described are not the only ones by which the extremely actinic light of magnesium may be safely developed, as I have made several negatives by the flash of a pistol, the weapon being loaded with a mixture of gunpowder and magnesium.

In comparison with other methods of artificial illumination adapted to portraiture, this panactinic light, if I may be permitted so to call it, is characterised by extreme softness, a feature impossible to obtain with either a single electric or calcium light, or with the magnesium tape; due to the fact that with these latter the light emanates from a comparatively small point, while the magnesium-cotton light gives a large diffused blaze.

The prints which I exhibit this evening are from negatives which have been taken simply with a view to the demonstration of the actinic power of the light, and are to be judged from this and not from an artistic standpoint. It remains for the professional photographer, skilled in the use of screens, reflectors, and other accessories, and familiar with the art of posing, to obtain the best results that this means of illumination is capable of producing.

HENRY G. PIFFARD, M.D.

ZINC ETCHING.

A ZINC plate having a smooth, polished surface is taken, and upon it is drawn the required design with an ink composed of asphaltum, turpentine, and oil (enough to keep the composition in a liquid state), and a little lampblack to darken it. Or, if the object to be reproduced be an engraving, either stone, plate, wood, or any other material, it is transferred by the usual mode; that is, by taking an impression from the engraving on "transfer paper," and thence to the zinc plate.

The transfer ink used is a compound of ordinary lithographic printing ink and asphaltum, in the proportion of about one-third of the latter to two-thirds of ink. The drawing or transfer having been completed, and before the ink has become dry, it is covered with a coat of powdered resin or copal, the back of the plate being also coated with asphaltum to render it acid proof. The plate is now ready for the bath, which consists of muriatic acid of about 1.2 specific gravity (or other suitable acids, either in their pure or diluted state, such as nitric acid, &c.), where it is allowed to remain about five seconds. It is then taken out, washed, dried, and when dry, heated only enough to melt the powdered resin or copal, so as to form a crust which will protect the edges of the drawing or transfer which has been formed by the first exposure of the plate to the etching agent. The plate is next returned to the bath of muriatic acid, again allowed to remain about five seconds, and washed and dried once more. Those portions which are high enough to print are then covered with asphaltum, and another coat of powdered resin or copal is added, after which it is replaced in the bath and allowed to remain until sufficient depth is obtained on the exposed parts. These operations of covering the plate and returning to the acid may have to be repeated three or four times, according to the nature of the work. The plates used are, of course, restricted to such metals as are affected similar to zinc.

-Scientific American.

FAILURES IN CARBON PRINTING AND THEIR CAUSES.

FAILURES.	CAUSES.
<i>The black gelatine whilst sensitising runs off in streaks.</i> <i>The same occurs whilst drying.</i>	The sensitising bath was too warm.
<i>Particles of dust or fibres of the paper adhere to the tissue after squeegeeing.</i> <i>The tissue does not lay flat in the printing frame.</i>	The bath was too warm; squeegee the tissue plates on a glass or zinc plate and dry in cooler room. The plate was not clean, or the squeegeeing had been done without the rubber cloth.
<i>The tissue sticks to the negative.</i>	The paper has been dried too fast and should be allowed to absorb a little dampness.
<i>The wax on the plate cannot be polished.</i>	The paper was not dry enough, or the negative or pad was damp. Impermeable paper or rubber cloth should be laid between the tissue and the pad.
<i>Small air-bells appear after laying the sensitised tissue upon the glass plate.</i>	The plate was too cold, the wax was not pure, or the polishing flannel was damp.
<i>The tissue does not stick to the plate, the borders raise.</i>	The paper was not a sufficient time in the cold water, or had not been lowered with enough care upon the plate. Withdraw the tissue, re-moisten and replace it.
<i>The tissue in developing does not separate from the plate, or the picture does not develop, remaining too dark.</i>	It had remained too long in the water, was over exposed, or suffered from emanations from kitchen, gas, &c. Apply pressure for ten to fifteen minutes. A prompt way to learn if the paper is still good is to apply hot water to a small piece of unexposed tissue; if the gelatine dissolves it is still good.
<i>The tissue lifts too quick from the plate and the picture is too light.</i>	The exposure was too long, or the transfer was made too late after the exposure to light. Hotter water, or a bath of two per cent. carbonate of soda, or the addition of a few drops of liquid ammonia may be used; or the paper is not good.
<i>Air-bells appear on the back of the tissue when immersed in the developing bath.</i>	The exposure to light was too short. Develop with cooler water. The water was too warm. Begin with cold water and raise its temperature by degrees. The air-bells often show in the picture.

FAILURES.	CAUSES.
<i>The picture lifts on the borders whilst the collodion remains.</i>	No safe edge has been used, or the paper was spoiled. Too old, or affected by emanations from gases.
<i>The picture, together with collodion, lifts from the plate.</i>	The wax contains tallow. A slight addition of resin to the waxing solution is the remedy. The collodion had dried too much before the plate was immersed in water.
<i>The collodion film breaks.</i>	It is too soft or too fresh; addition of negative varnish. The film was hurt. The borders of the plates are too sharp.
<i>Dirt or particles of paper between picture and plate.</i> <i>Air-bells between the picture and the plate or the flexible support.</i>	If they were not on the plate since the beginning, they come from the water. The tissue was not lowered carefully upon the support, or the squeegeeing was not done in the right way.
<i>The picture is full of small fissures.</i>	The paper was too long in the sensitising bath, or the bath was too strong or too warm.
<i>The picture appears granular or reticulated.</i>	The tissue was not left long enough in contact with the support. Paper which has suffered from emanations of gases, or dried too fast, shows these defects very often.
<i>The picture swells up much when immersed in water, and moss-like excrescences appear in the picture.</i>	The sensitised paper is spoiled by emanations from kitchen, stable, gas, or closets.
<i>Reticulation of picture during development on glass plates.</i>	The exposed paper had not remained a sufficient time in cold water before effecting the transfer.
<i>Small brilliant spots or air-bells appear in the picture.</i>	Same reason as the preceding. They form some minutes after the transfer, and as they are between the paper and the collodion, there is no remedy.
<i>Cloudy appearances, principally in the background of the picture.</i>	If hotter water does not remove them, then they are due to the alcohol which was still present in the collodion when making the transfer.
<i>The picture shows no half tones.</i>	The negative was too dense. Expose the tissue before or after printing for a few seconds to daylight; or the paper was dried too fast, and consequently is too soluble.
<i>The transferred and dry picture does not leave the support, or sticks to it in some places.</i>	The proper flexible support or plate was not well waxed; the waxing solution contains too much resin; the waxing was polished off entirely; or the flexible support was dried with too much heat.
<i>The double transfer paper leaves the plate without the carbon picture.</i>	It has been dipped in too hot water, or the alum bath was too strong.
<i>The picture is full of brilliant spots, principally in the high lights and around the outlines.</i> <i>The picture is granular.</i>	The transfer paper was soaked in too cold water. The second transfer was made too late. MAX BÖELTE in "Anthony's Bulletin."

NOTES FROM ABROAD.
(From our Special Correspondent.)
III.

THE LICHTDRUCK WORKS OF HERR OTTO AT DUSSELDORF.
IN Dusseldorf I have had the pleasure of seeing in operation the lichtdruck process at the works of Herr Wilhelm Otto, 42, Schadowstrasse. These works have belonged to Herr Otto for seven years, but were founded about thirty years before that by J. & R. Overbeck. One of the printing machines in use during my visit, and driven by a gas engine, was constructed by Messrs. Schmierns, Werner, & Stein, of Leipsic.

- A solution is first prepared consisting of:—
- Silicate of soda 60 grammes.
 - Water 120 "
 - The whites of two eggs.
- A well cleaned, thick piece of plate glass is coated with the above solution and dried; it is next washed for half an hour in running water, and dried again. By this means a fine, even, and insoluble grain is given to its surface.
- The sensitising solution, which is next applied, consists of:—
- Gelatine 20 grammes.
 - Water 200 "
 - Bichromate of ammonia 2 "
 - Bichromate of potash 2 "

The plate is then exposed under a negative. A gelatine negative is never used for the purpose if it can be avoided; in all cases, negatives taken by the wet collodion process are preferred.

In dull weather the printing is effected by the electric light, a suspended lamp being made to slowly vibrate like the ball of a pendulum before the printing frame, at a distance from the latter of about ten inches. This printing by artificial light is effected in from ten to forty-five minutes, according to the density and colour of the negative; by sunlight the time of printing is from three to ten minutes, according to circumstances.

After exposure the plate is washed in cold, running water for four hours, then placed upon a rack to dry during the night. It is next placed upon a levelling stand and some of the following solution is poured over it:—

Glycerine.....	1000 grammes.
Water	300 „
Ammonia (0·880).....	100 „
Thiosulphate of soda.....	25 „

This solution, which gives the gelatine the power of taking colour from the printing rollers, is left upon the plate for fifteen minutes or half an hour, then it is wiped off with a sponge. The surface of the plate is next dabbed with a clean, dry cloth, and the plate is ready for the printing machine.

If too much ink, or too strong ink, be applied in the first instance, there is much trouble in getting the plate clean again afterwards, but it must then be cleaned before good prints can be obtained. The back of the plate is cleaned with a knife before it is put upon the machine.

The chief difficulties of the process lie, as in all engraving printing, in the machining; the machine must be a good one, and the proper amount of ink and pressure to give good results must be carefully adjusted. I saw a specimen of lichtdruck work at Herr Otto's which had just been executed for a London photographic firm. It was a vulgar picture, comprising three large heads—a picture which would break the heart of any French, Italian, or, I hope, German artist, did he have to devote his skill to printing the same.

Herr Otto carries on, as well, a general photographic business. He has a portrait studio, and takes likenesses when necessary by the aid of his electric arc lamp; the little dynamo is driven by the gas engine. The same engine, by means of suitable apparatus, produces an air blast, by means of which the gelatine plates are dried, for Herr Otto makes his own plates for portraiture, and by Audra's formula. In photographing by the electric light, the rays from the arc do not, of course, fall directly upon the sitter; they are sent back by a great parabolic reflector made of whitewashed canvas. Herr Otto is agent in Dusseldorf for Stirn's coat-button camera, and from selected pictures taken therewith he has some fair enlargements, about eight inches in diameter.

DR. LIESEGANG'S ESTABLISHMENT AT DUSSELDORF.

Who has not heard of Dr. Edward Liesegang, whose establishment at 13, Cavalleriestrasse, Dusseldorf, is one of the great headquarters of photography in Europe? Externally his establishment is a large private house, built with that solidity which characterises houses in countries where householders are their own ground landlords; internally it has plenty of offices and clerks, for in Dr. Liesegang the man of science and the man of business are combined.

Dr. Liesegang was born in 1838 at Elberfeld, near Dusseldorf, and was educated at Vienna, Berlin, and Giessen Universities; he always devoted special attention to the subjects of chemistry and mathematics. About the year 1853 he bought a collodion positive process of Wulff, of Paris, for one hundred francs, and tried to make collodion; by the process direct positives on glass were transferred to leather, and the pictures were called "panotypes." The photographs looked nice, so the public began to ask him to make collodion for them, which he did, while in business with his father in Elberfeld. Thus he gradually became known in the photographic world. In 1859 he published the first edition of his *Handbuch der Photographie*, and in January, 1860, the first number of his monthly journal, the *Photographisches Archiv*. Next he started *Le Moniteur de la Photographie* in Paris, with M. Lacon as editor. In Dusseldorf he brought out in March, 1877, the *Lanterna Magica*, a monthly journal, which at present is the only one in Europe devoted specially to the optical lantern and allied subjects. Lastly, he issued the first number of the monthly journal *Der Amateur Photograph*, in January, 1887. In 1861 he issued the first *Photographischer Almanack*, the earliest annual volume of the kind. Up to the present time his *Handbuch der Photographie* has been translated into ten different languages. In 1873 Dr. Liesegang moved from Elberfeld to Dusseldorf, and at the present time he has some chemical works at Bilk, near Dusseldorf. He does not allow any stranger to go over any of his works. He has published a large number of books by different authors upon photography, including German editions of some of the best books by English writers upon the subject.

Among the historical curiosities on the premises at Dusseldorf is one of Sutton's panoramic cameras, made by Cox, of Ludgate-hill. Dr. Liesegang took some pictures with it in Jersey, and bought the French and Belgian patent rights for its construction, but he never made one. Its chief objectionable feature is that the curved plates are difficult both to coat and print. The printing was the greatest difficulty; contact had

to be effected by means of indiarubber backs, and to get equal illumination the printing frame had to have a motion of rotation. Dr. Liesegang has a modification of Johnson's pantoscopic camera made by himself, and by means of which very large and perfectly sharp pictures can be taken with but a quarter-plate lens.

Another curiosity in the possession of Dr. Liesegang is a positive picture taken about 1864 in America, by the process of the late Wenderoth, of Philadelphia. Wenderoth, in his process, took a Daguerreotype plate, spat upon it, then rubbed it with a toothbrush to give it a dead instead of a polished surface; next he squeezed a positive carbon print down upon it, and afterwards fixed a glass over its face. Such pictures were turned out commercially for several years in the United States, but the process is now extinct. The first lichtdruck pictures were taken by Tessier du Mothay, at Metz, from plates of copper; Dr. Liesegang has some specimens of his work as good now as the day on which they were printed. Tessier du Mothay was a commercially unsuccessful photographic inventor; the last time Dr. Liesegang saw him was at the Hôtel de Ville in Paris, where he had a commission from Napoleon III. to perfect the zirconium light as produced by a method of extracting oxygen from the atmosphere.

About a dozen years ago, Mr. Jabez Hughes took Dr. Liesegang to Oxford, where he had to copy a water-colour painting for Queen Victoria, who examined the image of the picture upon the ground-glass of the camera, and remarked that it was a great pity that photographs could not be taken in natural colours. Dr. Liesegang then informed her that he had seen Nièpe de St. Victor taking photographs in natural colours at the Louvre. Nièpe could reproduce true greens, such as that of the emerald, but not the green of the leaves of trees; exposures of several hours' duration were necessary.

Dr. Liesegang obtained his degree of "Doctor" at Rostock, in Germany, for proficiency in chemistry. He is ably supported in the work relating to his different journals by his assistant-editor, Herr Hermann Schnauss, son of Dr. Von Julius Schnauss, the author of a valuable book upon photo-mechanical printing.

In my walks about Dusseldorf I chanced to see the house in which Mr. J. Hubert, the well-known London photographer, was born, in the street leading from the Market Place and through an archway to the Bridge of Boats over the Rhine. At the residence of Dr. Liesegang I had the pleasure of meeting Mr. William Lang, jun., who was travelling on the Continent, to make arrangements for the forwarding of interesting photographic works of high art to a forthcoming exhibition in Glasgow.

CELESTIAL PHOTOGRAPHY.

At a joint meeting of the Literary and Philosophical and Astronomical Societies of Liverpool, Mr. Herbert Sadler, F.R.A.S., read a paper on *Celestial Photography*, in which he referred to the great advances which had lately been made in astronomy by the assistance of photography. Starting from the first crude and imperfect pictures of the sun and moon, astronomy and photography had marched hand in hand, until the present methods of manipulation enabled us to photograph objects which the eye can never hope to see. The paper was profusely illustrated by celestial photographs, and in calling attention to a picture of *Capella*, Mr. Sadler explained that the rays which affected the plate started on their errand during the battle of Waterloo. As an illustration of the far-reaching power of the photographic eye, the map of the Pleiades, constructed by M. Wolf, contained 671 stars, and after a careful sounding in this direction with the largest telescope in the Paris Observatory, the author felt assured that all beyond was darkness, and that he had absolutely reached the utmost depths of space. But a photograph of the same district, taken by the Brothers Henry with a much smaller telescope, in one hour showed 1421 stars, against the 671 which had taken M. Wolf three years to map.

Our Editorial Table.

A STUDIO CAMERA.

By PERKEN, SON, & RAYMENT.

In these days of pocket, portable, and detective cameras, one is sometimes apt to forget the studio camera, which has, or ought to have, no claims to be considered as belonging to the featherweight fraternity. Especially is this the case when, as in the one now before us, such camera is constructed for 10 × 8 plates with reversing arrangement, by which the plate can be placed in either a vertical or horizontal position.

The studio camera of Messrs. Perken, Son, & Rayment, although not professedly one of the portable class, does, however, fold up in a wonderfully small bulk, more especially when its various appliances and great length, when fully extended, are taken into consideration. The range of focus capable is from four to twenty-eight inches, which, when a rapid doublet is employed, means a further focal power of

about two inches added to its already considerable range. With this camera, therefore, a lens of thirteen inches focus could be employed in copying a picture on a scale even larger than the original. The value of a great extension of the camera is now universally admitted, and with this instrument a lens may be employed in taking scenes on a telescopic scale. The camera in question has an ingeniously contrived swing back, and the lens is fixed upon a front which is rigidly attached to the baseboard, an advantage when either weighty lenses or those of long focus are employed; for whereas a tremor of the sensitive plate during exposure will only tend to a slight softening of the definition, an equal tremor of the frame, which carries the lens, may cause the image to dance over a large portion of the plate. The camera, however, has both horizontal and vertical sliding motions for the lens. Finished and fitted with singular care, and brass bound wherever necessary, this camera also possesses an easily unshipped division, by which two different pictures may be taken on one plate if desired.

Invited by the makers to say if in our estimation it could be improved in any way whatever for the purpose for which it is intended, we must answer, No.

STEREOSCOPIC APPLIANCES.

Rapid Lenses by WRAY, London. The Kershaw Shutter.

A PAIR of lenses of the very rapid doublet class, and accurately paired for stereoscopic work, is, we were about to say, on the editorial table, but as a matter of fact they are now on the editorial camera.

Dark weather demands rapid lenses, and those which Mr. Wray, of Highgate, London, has sent are certainly very rapid, for they give sharp crisp definition with an aperture much in excess of most lenses of the "rapid" genus, and while purporting to cover a 5×4 plate, we have made them cover (with a small diaphragm in this latter case) an 8×5 plate quite easily. For either instantaneous stereo work, or for a detective camera, they behave nobly—dull though the November weather be. Being symmetrical in construction they project an image with rectilinear accuracy. The equivalent focus of each is about five and a half inches.

Allied with the above is a shutter we have received from Mr. Kershaw. When lately in Manchester we heard much concerning the Kershaw shutter, and saw much good work effected by its aid, and now we have an opportunity of judging of its merits from personal trial. Mr. Kershaw's invention consists in a framework which slips upon the lenses (the one before us is for a binocular camera), the circular apertures in which are covered by an opaque screen, having in it a square opening to admit the light. There are axes at top and bottom, around which this screen winds. One of these axes is fitted with a spring, which is capable of being braced up to impart any desired degree of rapidity of action. The other serves to wind up the curtain; and the liberation of a catch, by pneumatic ball, throws a click out of gear, thus effecting an instantaneous passage of the aperture in the curtain across that of the lens.

CHRISTMAS CARD MOUNTS.

London: MANSELL & Co.

FROM Messrs. Mansell & Co., 271 and 273, Oxford-street, W., we have received samples of photographic mounts specially intended for the Christmas and New Year. The mottoes are reasonable and well selected, while the mounts themselves—elegantly finished in gold—are all that can be desired.

PRACTICAL GUIDE TO PHOTOGRAPHY.

By MARION & Co.

THIS is a reissue of a very useful work which we have lately reviewed. A leading feature in the present edition is the devoting, by way of commercial addendum, of over a hundred pages to a description of the various productions of this enterprising Company.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 15,827.—"An Improved Method of Heating Hollow Rollers for Photographic Rolling Presses, Rolling Machines, and the like." W. E. MOSS and J. MITTON.—Dated November 18, 1887.

No. 15,984.—"An Improved Method of, and Apparatus for, Coating Glass

or other Surfaces for Photographic Purposes." W. J. COX.—Dated November 21, 1887.

No. 16,003.—"Improvements relating to Photo-chemical Printing." Complete specification. W. WILLIS.—Dated November 21, 1887.

PATENTS COMPLETED.

[IMPROVEMENTS IN THE MANUFACTURE OF SENSITIVE PHOTOGRAPHIC FILMS AND IN APPARATUS THEREFOR

(A communication from GEORGE EASTMAN, Rochester, New York, United States of America, Manufacturer.)

No. 3530. ALFRED JULIUS BOULT, 323, High Holborn, Middlesex.—March 8, 1887.

SINCE the introduction of the article known as bromide paper for photographic positives and negatives, numerous attempts have been made to devise a practicable method of manufacturing the material on a large scale and at less expense, both in time and material, but until the present invention no material progress had been made and the manufacture was conducted by what may be termed the original processes, that is to say, either by laying the sensitised material on the paper with brushes, or the more common method of passing the strip of paper around rollers, uniting the ends of the strip to form an endless band, and by the rotation of the rollers causing the band to travel in contact with a body of emulsion until the entire surface had received a coating, when it was suspended or left hanging until dried.

A moment's consideration of the nature of the sensitised material, the conditions under which it is applied, and the changes to which the paper is subjected, will serve to show why the ordinary processes of coating and the machinery employed are incompetent to perform the operations and at the same time preserve the necessary conditions.

The sensitised emulsions, so ordinarily compounded, contains as the sensitive medium silver salts dissolved or held suspended in a mixture of water and gelatine, the latter serving as the vehicle for carrying and holding the sensitive material upon the paper. The silver salts are a valuable product, hence it is desirable that the minimum quantity capable of producing good work should be employed; and for that and other reasons only sufficient gelatine is mixed in the emulsion to produce, when applied to the paper, a film layer of just sufficient depth to retain the desired or requisite quantity of the sensitised medium.

As is obvious, the layer or film of emulsion deposited on the paper must be as free from spots and irregularities as possible, hence any treatment of the paper or coating before, during, or after the emulsion is applied, which will produce or favour the formation of spots, streaks, or irregularities in the surface or thickness of the film, will result in the production of defective and unsalable paper, involving the loss of much valuable time, labour, and material.

It must also be remembered that the emulsion is in a liquid condition when applied to the surface of the paper, that the paper becomes saturated by the water contained in the mixture, that no opportunity is afforded for a critical examination of the coating nor can the defects in its surface be removed or remedied after the gelatine is once set, and that the entire process has necessarily to be conducted in a photographic dark room; hence, if the finished article contains the irregularities and inequalities mentioned, they cannot readily be discovered or detected even by a critical examination,—the coating is so extremely thin—until the final test,—actual use—has been applied and then, and not before, can the mercantile and practical value of the material be ascertained.

It will be readily understood, therefore, why the ordinary processes employed for coating cloth, paper, and other materials, with paint, glue, paraffine, and other substances and compounds not requiring so even and regular a surface as photographic paper, whose irregularities are measured not by instruments but by the results produced by the action of light alone—why said processes and machines have not, and cannot as ordinarily worked, be used in the manufacture of photographic paper.

As before stated, notwithstanding the many attempts made to produce a successful article of bromide paper by a cheaper and more practicable method, the only process by which it was generally understood it could be made successfully and the only one in practical use at the time of this invention, was that in which a belt or band of paper with its ends united was caused to pass through a bath of emulsion; and when the band had been drawn through the liquid and the coating applied, it was either raised out of the bath and allowed to hang until dry, or, what is the same thing, was removed to a drying frame and suspended thereon.

The use of brushes for applying the coating, although attempted, has not proved successful, owing to the extreme difficulty experienced in applying the emulsion evenly throughout the entire surface of the paper.

After many unsuccessful attempts and the expenditure of much time, labour, and money, my foreign correspondent has succeeded in discovering a method of manipulation whereby, by a continuous process, he has been enabled to produce a commercial article of bromide paper expeditiously and cheaply in sheets of any desired dimensions and with the minimum of waste.

In the following specification and claims, the expression web, web of paper, fabric, paper, &c., is intended to mean the web or band drawn from the roll or other source of supply, whether that web be of paper, muslin, silk, or other material which may be employed; and similarly the expression emulsion, sensitised emulsion and the like, is intended to mean any emulsion solution or photographic substance, salted or unsalted, sensitised or unsensitised. Coating, coated, &c., refer to the coat or film spread upon the web.

This improvement in the method relates more particularly to the treatment of the paper after the coating has been applied, and consists, generally stated, in so conducting the operation that after the paper has been supplied with a thin and uniform coating of the emulsion, and while the layer is still in a fluid state the coated web of paper shall, while under sufficient tension to maintain its surface flat, be drawn or moved continuously in the same direction until the gelatine in the coating has set, after which and as rapidly as the web is delivered, it is hung in loops or deposited upon a frame where it is allowed to remain until the paper has thoroughly dried.

It is of the utmost importance in practising this improved process, that the paper (which is drawn from a roll of any desired dimensions) should receive an even coating of the fluid emulsion, and it has been found that this can best be secured by causing the strip or web of paper to pass into and emerge at an angle from a layer or body of the fluid emulsion, so that the paper as it rises from the level surface of the liquid may carry only so much of the emulsion as adheres to its surface, the surplus flowing back into the receptacle.

The web of paper, as it passes through the emulsion, takes up a large quantity of water which acts to expand and soften it, hence it becomes necessary to apply sufficient tension to draw it flat over the rollers or other supporting devices. The tension on the paper must be, however, so regulated that, while serving to maintain the web flat and move it at a uniform speed, it shall not produce wrinkles by the unequal strain upon the now weakened and expanded paper, for if such wrinkles or other irregularities on the surface occur, the still fluid coating will run irregularly and form in streaks on the paper.

It is to be observed, moreover, that after the coating has been evenly applied to the web, and while the latter bearing the fluid coating is confined in motion to preserve and maintain its uniformity, it is essential that the coated face be unobstructed while the material is setting, that is to say, it must be held and maintained out of contact with any foreign substance, such as pressing rolls, scrapers, or other devices, which, if permitted to so much as touch the coating, would defeat the purpose of the process by destroying the uniform character of the film and render the latter unfit for photographic purposes.

The rate of motion and distance intervening between the coating devices and the hang-up frame vary with the state of the atmosphere and the quality of the emulsion. Ordinarily, in using a machine such as hereinafter described, the rollers are driven at such speed as will advance the paper twenty feet a minute, and with the temperature of the room maintained at about sixty-five degrees, the hang-up is located at about thirty feet distance, that is to say, the paper is maintained in motion for about one to two minutes after leaving the coating bath before it is deposited upon the slat of the drying frame. The time and distance must, of course, be adjusted and regulated according to the temperature and state of the atmosphere, and, if desired, artificial cooling and drying devices may be employed, but under all circumstances, in order to prevent blemishes when practising the continuous process, the coated web must be kept in motion and flat until the gelatine has set so as to be incapable of further movement upon the surface of the paper, and when this stage has been reached, but not before, can it be suspended in loops upon the drying frame and remain there until the moisture has evaporated, without injury to the coating.

The movement of the web after the coating material has been evenly applied, and which is continued until the coating has set or stiffened so as to prevent running, is a progressive movement, the travel being at all times forwards, but in order that the flow of the material may be regulated, and the uniformity of the coating maintained, it is desirable that the direction, *i.e.*, the angle of inclination of the web during its progressive movement, should at times be reversed or altered, so that at one point it will travel upwards and subsequently downwards, or *vice versa*, thereby arresting or changing the direction of flow, if any takes place, of the liquid coating upon the travelling web.

Thus, in the machine illustrated, the web, as it emerges from the coating device, is caused to move first upward, then horizontally, then downwards, then horizontally, and again upward to the delivery roller.

Under certain circumstances, as when it is desired to use a thin emulsion or in warm weather, the setting of the coated film may be facilitated by reducing its temperature as it passes from the coating apparatus to the hang-up machine. This artificial cooling of the coated web may be accomplished by the use of a current of air, or by causing the web to pass over a surface the temperature of which is kept down as by a current of cold air, water, or a cooling mixture or compound. A fan-blower or other suitable device may be employed to produce a current of air, which is cooled by passing over ice or in any other preferred manner, the air being carefully strained from dust.

It is obvious that the process herein described is adapted to the coating of webs or strips of fabric with a surface coating of any material which has a tendency to run and streak after its application, and which possesses the property of setting or stiffening gradually while the web is maintained in motion, to preserve the uniform surface of the coating.

It will be observed that according to the present invention three distinct operations are required to produce the finished article, first, the application of the coating material; second, maintaining the web in motion until the coating thereon has set or stiffened sufficiently to prevent running; and third, depositing the coated web as rapidly as the coating sets or stiffens upon a support to dry, and further that all those operations are performed simultaneously, but upon different portions of the same continuous web or band of paper, so that while at one point in the length of the travelling web, the coating is being applied at another, it is setting or stiffening, and at still another and more advanced stage is delivered or deposited upon the drying frame.

The improved apparatus for manufacturing sensitive photographic films is represented in accompanying drawings.

The claims are:—1. The herein-described process of coating a continuous web with a uniform layer of emulsion, consisting in applying the emulsion to one side of the web as it is passed through the coating device, in artificially cooling the coated web, in keeping the coated web in continuous motion and the coated surface free from damage by contact until it has set, and finally in delivering the web to a suitable rack or frame to dry, substantially as described. 2. The herein-described process of coating a continuous web with a uniform layer of emulsion, consisting in applying the emulsion to the lower side of the web as it is passed through the coating device, in carrying the coated web on suitable supports around the coating apparatus, and keeping it continuously in motion and the coated surface free from damage by contact until the emulsion has set or stiffened sufficiently to prevent flowing, and in subsequently delivering the coated web to a suitable drying frame or rack substantially as and for the purposes set forth. 3. The herein-described

method of producing uniform coatings upon continuous webs which consists in applying the coated material in a fluid condition evenly upon the face of the web, and in changing the flow of the coating upon the web to regulate and maintain its uniformity and maintaining the web in motion and its coated surface free from damage by contact until the coating has set hardened or dried sufficiently to prevent running substantially as described. 4. The herein-described improvement in the art of producing photographic paper which consists in applying to one face of the web a uniform coating or surface of fluid sensitised emulsion, by causing the paper to emerge from the level surface of a body of emulsion, and subsequently maintaining the coated web in motion continuously and uniformly in the same direction and the surface of the coating free from damage by contact until the emulsion has set or stiffened sufficiently to prevent running substantially as and for the purposes set forth. 5. The herein-described process of producing sensitised photographic paper consisting in applying to a moving continuous web a uniform layer of sensitised emulsion, keeping said web in motion and the coated side free from damage by contact until the coating is set or stiffened sufficiently to prevent flowing and finally drying the coating. 6. The herein-described method of producing uniform coatings upon continuous webs which consists in applying the coating material in a fluid condition evenly upon the face of the web, and subsequently maintaining the web in motion and its coated surface free from damage by contact until the coating has set or hardened sufficiently to prevent running substantially as described. 7. The herein-described continuous process of producing sensitised photographic fabric consisting in applying in a suitable non-actinic light to a running continuous web a uniform layer of sensitive fluid emulsion, keeping said web in motion and the coated side free from damage by contact until the coating is set or stiffened sufficiently to prevent flowing, and finally while the web is in motion and the coating being applied depositing that part of the web on which the coating has set or stiffened at rest with relation to its supports to dry. 8. In a machine for coating a continuous web with emulsion the specified arrangement of the rollers about the emulsion trough whereby the coated web is carried around the said trough without the coated side coming in contact with said rollers and space is economised and sufficient time allowed for the coating to set before being transferred to the hang-up apparatus substantially as described and illustrated in the accompanying drawings. 9. The complete apparatus constructed and operating substantially as and for the purpose described and illustrated in the accompanying drawings.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
November 29 ...	Bolton Club	The Studio, Chancery-lane, Bolton.
" 30 ...	Burnley and District	
" 30 ...	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
December 1 ...	Bolton Photographic Society ...	
" 1 ...	Dundee and East of Scotland ...	Lamb's Hotel, Reform-st., Dundee.
" 1 ...	Glasgow Photo. Association	Philosophical Soc. Rms., 207, Bath-st.
" 1 ...	Leeds	Philosophical Hall, Leeds.
" 1 ...	London and Provincial	Mason's Hall, Basinghall-street.
" 2 ...	Yorkshire College	

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. William England, Vice-President, occupied the chair.

Colonel NOVERRE said that after developing some of Eastman's stripping films with ammonia in the solution, a faint negative was left on the insoluble substratum; the sensitive film appeared to be thinner than desirable. He thought the negative itself in such cases to be too granular. What was the cause of the phenomenon?

Mr. ARNOLD SPILLER responded that Mr. Warnerke had discovered that under certain circumstances the film became insoluble where the image was formed; perhaps some of this insoluble matter adhered to the substratum.

Mr. WILLIAM BEDFORD called attention to an important modification of the platinum process recently published.

Mr. T. BOLAS knew no more about the new method than had been published.

Mr. G. SCAMELL said that an important question had been asked in THE BRITISH JOURNAL OF PHOTOGRAPHY, and never answered yet—"What is the best method of photographing upon wood?" Could any one give a reply?

Mr. E. COCKINO said that very little water must be used in any such process.

Colonel NOVERRE asked whether the image in brown platinum types was all of platinum?

Mr. A. COWAN believed such to be the case.

Mr. COCKING stated that he had been erroneously described in the *Daily Telegraph* as "Manager of the Photographic Society of Great Britain," although in his letter to that journal he had correctly styled himself the Assistant Secretary to the Society and Manager of its Photographic Exhibition.

Mr. A. MACKIE said that some persons had been fooling several daily papers into the belief that by a commercial process they were taking photographs in natural colours.

Mr. W. COBN called attention to an advertisement of "The Photographic Company, Limited," in the *Standard* of November 22, which he said would be likely to convey the idea to the public that the Company was taking photographs in natural colours. Could not the Photographic Society take some action in the matter?

MESSERS. DEBENHAM, BOLAS, and others, made some strong remarks about the Cellerier-Parques process.

The CHAIRMAN stated that at one of the meetings of the Society in January, the subject of stereoscopy will be brought up; Mr. Donkin intends to bring some reflecting stereoscopes, and he hoped others would bring anything interesting relating to the subject.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

On Thursday night, November 17, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. W. M. Ashman presided.

Messrs. F. H. Berry, W. B. Wright, and R. W. Goodden were elected members of the Association.

The HON. SECRETARY announced that the Liverpool Amateur Photographic Association will hold a photographic exhibition for one fortnight, commencing March 5, 1888, at the Walker Art Gallery, Liverpool.

Mr. F. W. Cox exhibited a simple and very cheap Fletcher's burner, giving a solid flame for heating platinotype solutions.

Mr. F. A. BRIDGE said that it was a burner which consumed little gas.

The CHAIRMAN believed it to be used exclusively now in laboratories for heating small quantities of solutions.

Mr. A. HADDON stated that if it were used with the enamelled iron trays issued by the Platinotype Company the enamel would crack over the burner, because of the local concentration of heat; those trays should be made part of water baths, by placing them in zinc trays containing water, and then heating the water with the burner.

Mr. BRIDGE had had an enamelled dish in use over a bare flame for five or six years and it had not cracked; it was very thinly coated with enamel.

The CHAIRMAN had had one in use for twelve years over a bare flame for boiling down silver solutions; it exhibited no sign of a crack.

Mr. A. P. HIGGINS exhibited an arrangement for keeping emulsion warm while filtering, consisting of the inverted upper part of a bottle; a cork was placed in the inverted neck to let the neck of the funnel pass through, and the outer vessel thus made was filled with hot water. He had cut the bottle with a glass-cutter followed by the application of a hot iron.

The CHAIRMAN cut bottles by means of a string soaked in turpentine tied tightly round them; he then set fire to the turpentine and while the glass was very hot where the string had been, he dipped it in cold water.

Mr. BRIDGE had broken three bottles out of four by that plan.

Mr. W. H. PRESTWICH had found the plan to work well except when the bottles were thicker upon one side than the other.

Mr. A. COWAN said that Mr. Leon Warnerke cut bottles by first filing a notch in them, and then drawing a crack slowly round each bottle by means of a red hot point of hard charcoal.

Mr. HADDON remarked that Mr. W. J. Wilson and himself had discovered that if they could get a diamond to cut a ring inside a sufficiently large tube, and then applied outside heat from a Bunsen's flame, that tube could be cut into definite lengths with certainty; at least there were but one or two failures in cutting twenty or thirty pieces.

Mr. W. H. HARRISON had read in an American periodical that a bottle could be cut by placing it in a pail of water, with the surface of the water covered by a thin layer of turpentine. The turpentine was then fired, and the flame split to pieces the bottle above the level of the water, but left the rest of the bottle intact, so it was alleged.

The CHAIRMAN exhibited a photograph rather less than life size of the human eye. Such photographs, he thought, would be useful to artists. In the one exhibited he could recognise the expression of Mr. Offord.

Mr. COWAN stated that there was more expression in the human mouth than in the eye.

Mr. A. MACKIE was once working in hospitals with Mr. Francis Galton, classifying the colours of human eyes; he (Mr. Mackie) then concluded that it was necessary to make thirty or forty colour charts and to number them before they could give the idea to others of the particular colour of any particular eye.

The Chairman exhibited a small photograph of an interior taken by the magnesium light and gaslight combined.

Mr. HARRISON said that *Industries* newspaper, of the week before, contained a statement that magnesium is now being sold by a firm in Antwerp at one shilling and tenpence per pound; it did not state if in powder, or in what form.

The CHAIRMAN said that the powder when burnt in a descending flame after being mixed with sand diffused much more smoke in the room than if burnt as ribbon; in the latter case much of the oxide fell as ash.

Mr. HARRISON responded that German experimenters had found out how to burn the powder without any smoke being liberated in the room, and without the use of a long chimney.

Mr. MACKIE stated that at the Photographic Club recently, a photograph had been taken by means of seven and a half grains of magnesium flashed off upon fifteen grains of guacotton.

Mr. COWAN added that the picture so obtained was well exposed.

Mr. EDGAR CLIFTON said that a friend of his was of opinion that a wick might be thickly charged with magnesium powder, then soaked in alcohol, and fired.

The CHAIRMAN believed that a friend of his would shortly exhibit before the Association a method of burning magnesium upon a line cylinder made white hot with oxygen.

Mr. W. COBB asked what was the most prolific cause of white spots upon silver prints.

The CHAIRMAN replied that the causes were numberless; one fertile source was the use of albumenised paper kept too long before or after sensitising.

Mr. BRIDGE remarked that a lawsuit was going on about white spots in prints, and that several hundreds of pounds were at stake upon the result.

Mr. W. E. DEBENHAM had known spots to appear upon prints in the hypo or final washings from dust falling upon them from a badly plastered wall near the sink.

Mr. COBB asked how about prints in which white spots appeared several days or weeks after they were mounted.

The CHAIRMAN had known that to occur with prints mounted in a room below the toning and fixing room; small crystals or dust from the solutions which had penetrated the ceiling fell upon the prints.

Mr. BRIDGE had known spots to appear after a long time in prints upon one batch of white enamel mounts, but not upon prints mounted on another batch similar in appearance.

Mr. COBB said that he had found bronze powder to be the most fertile cause of white spots, because of the sulphide of tin therein.

The CHAIRMAN said that mounts of all colours might have bronze powder in them, in consequence of being printed in the works of a man who used bronze powder over other jobs, so that there would be plenty of its dust about the premises and the machinery.

At the meeting of the Association next Thursday, Mr. Bridge will read a paper upon *Spots on Prints*.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The Committee of this Association met on the 17th inst. The minutes of the previous meeting having been read, the election of Messrs. J. O. Dewey, J. S. Grimshaw, W. C. Smith, and J. Joel was confirmed.

The Committee then considered an application for aid to enable a member to proceed to a situation. The sum of 2*l.* was granted.

The following letter received under date of the 11th inst. :—"Dear Sir,—I am directed to hand you enclosed cheque, value 32*l.* 5*s.*, being the net amount received as entrance fees from ladies and gentlemen (253 in number) who have contributed their productions to our Third Annual International Amateur Photographic Exhibition, 1887. When the pictures are exhibited at our Regent-street Gallery we entertain the hope that the contributions we shall invite from visitors may form an important addition to our present donation.—I am, dear Sir, yours faithfully, S. Clark, Secretary, London Stereoscopic and Photographic Company, Limited."

The Committee passed unanimously the following :—"That the Committee of the Photographers' Benevolent Association tender their best thanks to the Managers of the London Stereoscopic Company for handing to the Benevolent Association the entrance fees of the contributors to their Exhibition."

A letter was then read from the North London Photographic Society, as follows :—"Dear Sir,—I have much pleasure in handing you a cheque for 1*l.* 4*s.*, being the proceeds of an impromptu collection at our dinner last night.—H. M. Smith, Hon. Secretary."

A member of the Committee then stated he was authorised to hand over the sum of twenty guineas to the Association on the conditions that 500*l.* should be obtained within twelve months for the express purpose of forming the nucleus to an orphanage. This generous offer was received with enthusiasm, the Committee pledging themselves to use their utmost endeavours to fulfil the requirements of the conditions. The amount was then handed over in trust, and the meeting terminated.

CAMERA CLUB.

At the lantern evening (Thursday, November 17) there was an unusually excellent and varied show of slides. Amongst the exhibitors were Messrs. C. B. Wright, P. Newman, Fison, F. Evans, Frith, Stainthorpe, Davison, Barclay, and Lionel Cowan.

The first part of the evening was devoted to pictures taken in Norway by Messrs. C. B. Wright and Fison, and to Swiss scenery by Mr. P. Newman. Mr. Fison's series included some interesting slides showing scenes in Norwegian villages, and those of Messrs. Wright and Newman comprised most beautiful and artistic effects of clouds and atmosphere amongst the mountains and lakes of Norway and Switzerland respectively.

After an interval Mr. Evans showed a very fine set of transparencies of cathedral interiors, also country studies; Mr. Frith a set from negatives taken in Egypt, and Mr. Barclay several illustrating work done on Club excursions. The lantern was worked by Messrs. Lyonel Clark and E. Ferrero.

The subject for Thursday, December 1, is *Photography as Applied to the Arts and Sciences*, when Mr. T. C. Hepworth will lecture and show illustrations. Meeting at eight p.m.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At a meeting held at Myddelton Hall on the 15th instant, Mr. E. Traill Hiscock in the chair, Mr. R. S. Allan was elected an honorary member of the Society.

A large number of views of Lisbon and neighbourhood were passed round by Mr. A. P. Higgins, and a selection taken in Holland by Mr. A. C. Cossor followed.

Mr. E. W. PARFITT showed two negatives taken under similar conditions; he desired to know why the difference in quality.

Mr. A. PRINGLE thought one had been slightly fogged.

Mr. F. W. COX then read a paper on *The Platinotype Process* [see page 743], and developed several exposed prints.

Mr. J. TRAILL TAYLOR (President) testified to the permanency of platinotype prints, and referred to some which had been subjected to extremes of temperature for some years and were now as good as when first made. Other prints made in silver at the same time had faded very much.

Mr. W. COBB confirmed the President's remarks as to permanence, and mentioned that he took the first medal given for this class of print.

Mr. PRINGLE said his name had been mentioned in connexion with the question of the permanence of these prints, and he should like to correct a misunderstanding. He had put platinotype prints to a series of tests quite satisfactory to the Company. He found by treating them with sulphuretted hydrogen he could materially reduce the image, but under ordinary conditions he believed them to be absolutely permanent.

Mr. A. COWAN spoke of a difficulty in matching panoramic views by this process. On one occasion when he desired to match a picture four feet long from four negatives it was necessary to produce eighty-four prints in order to get twenty-four alike in tone.

Mr. W. M. ASHMAN alluded to the difficulty of printing-in skies from separate negatives, and congratulated the lecturer upon the results shown.

Mr. BISHOP (a visitor) expressed his pleasure at being present to witness the demonstration of the process, being one in which he took a great interest, and thanked the Society for their kindness in inviting non-members to their lectures.

A hearty vote of thanks was accorded to the lecturer.

The next meeting will take place on December 6, when Mr. T. Charters White will lecture on *Photo-micrography*. Visitors are invited.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held at the rooms, 36, George-street, on Wednesday, November 9.—Mr. A. Coventry, Vice-President, in the chair.

The minutes of the previous meeting were read and confirmed.

The ballot was taken and Mr. E. G. Wrigley admitted a member.

Mr. H. SMITH gave an account of some recent experiences in the working of stripping films, and exhibited many stereoscopic transparencies produced on stripping films attached to glass plates. Mr. Smith gave details of his method of printing these stereoscopic pictures, which was briefly as follows. The negative was first measured to the exact requirements, the film was cut to the size required for the two stereoscopic pictures, then folded in two with a piece of opaque paper between, and in an ordinary printing frame the right-hand side of the film was printed from the left side of the negative, then reversed, viz., the left-hand portion of the film printed from the right-hand portion of the negative. He could thus, by correctly masking the negative and adjusting the folded film to lines drawn upon the mask on the negative, print the transparencies at any distance apart, as he wished. When the films were squeezed on to glass, and dried in blotting-paper, they gave a little appearance of ground-glass but not sufficient to dispense with a ground-glass. Mr. Smith replied to many questions from the members, the subject of stereoscopic printing and mounting being one of great interest.

The CHAIRMAN said the name of Mr. Abel Heywood, jun., was on the circular for a paper on *Pumphrey's Films*, but this being the last night before the closing of the Royal Jubilee Exhibition, and as Mr. Heywood was a member of the Executive Committee of the Exhibition, he was obliged to attend a very important meeting there.

The HON. SECRETARY (Mr. W. I. Chadwick) said as Mr. Heywood was unable to be present he had himself come forward as a poor substitute, and read a paper on *Transparency Making and Stereoscopic Work*, exhibiting several pieces of apparatus used in that branch of photography. Mr. Chadwick said he had brought the apparatus from home that morning and intended to snatch an hour or so during the day in which to write his paper, but was sorry to say he had found very little time, and had therefore very little to read, but he would "talk" the remainder.

At the conclusion of Mr. Chadwick's communication the formal meeting was adjourned, and the members passed around the room to inspect a series of about one hundred and fifty stereoscopic transparencies, views of the Royal Jubilee Exhibition taken by the Hon. Secretary. About thirty-five to forty stereoscopes were provided and arranged on tables properly illuminated. The admiration of these pictures was universal, and the following is the style of remarks that were passed by the members:—"I've been to the Exhibition twenty or thirty times, but I declare I have never seen so much of it as we have to-night." "Oh, I say, Smith, come and look at this one, isn't it splendid? How much does a stereoscopic kit cost?" "I never thought I should ever go into stereoscopic work again, but I am quite converted to-night." "I tell you what it is, Chadwick, your paper and exhibition to-night will, I am afraid, cost me ten pounds for a stereoscopic camera and lenses."

A vote of thanks was passed to the Hon. Secretary in complimentary terms, and in reply Mr. CHADWICK said he would accept all their compliments not for himself but for the stereoscope.

CHELTENHAM PHOTOGRAPHIC SOCIETY.

ANNUAL general meeting held November 10, at 4, Clarence-street.

The formal business consisted of the election of officers, which resulted in last year's officers retaining their posts.

Certain variations in the rules having been agreed to, the meeting proceeded to examine an exhibit of apparatus sent by Mr. McKellen.

General DAWSON produced and explained Mr. McKellen's camera with all the recent additions, including the new back which enables the operator to dispense with the focussing cloth.

Mr. BRETHAM showed the working of the roller slide of the same maker. This differs in some respects from the Eastman slide, having a means of marking the paper between each two pictures, and also in recording automatically the number of exposures made.

Sarjeant's shutter was also on view, notable for its small size and easy working.

The exhibition finished, General DAWSON introduced the subject of stripping films, showing his own negatives and prints, and calling attention to the different effects produced, according as one side or the other of the gelatine skin is placed in contact with the negative, in one case producing a clear negative, in the other a ground-glass effect, very suitable for their negatives.

It was arranged that at the next meeting Mr. Bretham should demonstrate the process of developing and stripping these films.

A vote of thanks was passed to Mr. McKellen for sending his apparatus.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The following is an abstract of the annual report presented at the meeting on November 2.

In presenting the twenty-eighth annual Report the Council are again pleased to have it in their power to congratulate the members upon the good progress which the Society continues to make. During the session forty-nine new members have been elected, and after making the deductions which a year's vicissitudes bring, in removals, resignations, and deaths, the total presently stands at 425, as against 393 last year. In one instance death deprived the Society of one who has been almost from its beginning a prominent figure in its history. Mr. J. G. Tunny died on September 24, after a protracted and painful illness. He ever took an active interest in the welfare of the Society, and was repeatedly an office-bearer. Nine ordinary and thirteen Council meetings have been held, and besides numerous sub-committee meetings. A number of outdoor excursions took place, which, though not numerously attended, were much enjoyed by those who took part in them. Two popular evenings were given in Queen-street Hall, which was crowded on each occasion. On both evenings vocal and instrumental music was provided by members and friends.

The annual exhibition of members' work took place in December, and was considered a very creditable one. About two hundred and sixty pictures were shown in prints, ceramics, and transparencies. The presentation print for the session was issued in August, from a negative by Mr. H. P. Robinson. The subject is entitled *A Chat with the Miller*. It is executed in colotype, and has been much approved. An interesting feature of the year was the visit to Edinburgh, on July 8, of a large excursion party from the Photographic Convention of the United Kingdom, then meeting at Glasgow. The report alluded to the papers and communications, demonstrations of film-stripping, and apparatus exhibited, all of which have been duly chronicled in these columns.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

At the meeting of the 11th ultimo, President Walker in the chair, after some preliminary business,

The CHAIRMAN said, I wish to call your attention to the use of hydrokinone as a developer. It has been used with great satisfaction by some of our members, and with the best results. It does not stain the hands, develops clearly without producing chemical fog, and gives a negative of good colour, with any degree of intensity required. A single mixture may be used for the development of a large number of plates, probably fifty or more, without any addition being made to it. It works more slowly toward the end of the day's use, but may be restored in a measure by a small addition of alkali. If a dozen plates are developed, the developer may be returned to the bottle and kept for another day's use. The only disadvantage thus far discovered is the lack of promptness with which the image appears, making the total time occupied in developing a plate perhaps fifty per cent. longer than would have been the case had pyro been used. But the results are fully equal, if not superior, to those ordinarily obtained by the use of the more familiar agent. In using hydrokinone it does not appear to be as necessary to rock the plate as is usually done with pyro, so a number of plates can be put in a dish and left there for development while other matters are being attended to, an occasional glance at them being all that is necessary until they are ready for removal to the hypo bath. It may also be used for bromide prints, and is especially good for lantern slides. A very good formula would be that adopted by Dr. Piffard; say, for No. 1, make saturated solution of hydrokinone about fifteen grains to the ounce; to each ounce of this add 60 grains crystallised sulphite of soda. For No. 2, make a solution containing 30 grains crystallised carbonate of soda to each ounce of water. For ordinary development mix equal parts of No. 1 and No. 2 to each ounce of water, and after using return developer to bottle and keep to use again. With over exposures a little bromide of potash may be used with advantage, but less than would ordinarily be used with pyro under the same circumstances. For under exposure less of No. 1 and more of No. 2, also plenty of water and patience. Photographers of all classes have long made research for some practical method, simple in manipulation and cheap as to cost, for use in making photographs at night. Electricity is expensive, the magnesium ribbon is too feeble and uncertain, and all have so far proved of no appreciable value for general use. To-night, however, Dr. H. G. Piffard, one of our most active members, will read an article upon a recent method devised by him for the production of such a light, and will exhibit for your instruction the whole operation of using it.

Dr. PIFFARD then read a paper on *A Simple Method of Making Instantaneous Portraits and other Photographs at Night* [see page 744].

Mr. ROCKWOOD: Last evening Dr. Piffard was at my gallery, and I made some negatives interposing a screen between the source of light and the sitter, thus affording an opportunity to soften the light if necessary. This picture of a little child which I have here, and which you can see, will serve to show you how quickly it was taken. I was at the child's side tickling her, and just as she said, "Oh, don't," her picture was taken, and you see her eyes have a very laughing expression. [The speaker then exhibited other photographs taken by agency of the light], and continued: There will be emergencies where it will be of the greatest possible use. I think it is practicable to attach it to an instrument which has got a small camera—a pistol, for instance—which will be uncovered at the moment of the flash, so that the picture will be taken by the light at the same time, and certainly anything within a distance of fifteen or twenty feet will be photographed accurately and quickly. I shall certainly introduce it to supply the light which is necessary for me to take photographs with in the latter part of the day. Very soon we will be in the short days when the light is very poor and insufficient, especially after half-past four or five o'clock, and I shall certainly supplement my day's work to the extent of an hour or so by the use of this light.

The PRESIDENT: I conceive this to be a very useful device for amateurs for taking photographs at home, or where they are spending their evenings out, and desire to take photographs of their family and friends. It will be of inestimable use to them, because the great difficulty of the amateur is want of time during the day to take photographs. This is the general complaint, that they haven't time, and in the evening heretofore they could not take photographs. But the light exhibited this evening affords the means, and if it is all that is claimed for it, will be a great boon for us all.

Mr. ROCKWOOD: It is proper to place a little emphasis on the fact that a screen made of thin material, such as Swiss muslin, should be introduced between the light and the subject. It serves to soften the light very effectually. This is why we get such perfect roundness in the picture which you have observed here.

Dr. H. VALENTINE KNAGGS, of London, was then introduced, and said: With respect to hydrokinone, I have used that a great deal in the development of lantern slides. I find it one of the best developers you can use for that purpose when they are made on bromide instead of on chloride plates. I have used the ordinary slow plates largely for lantern slides, and with this developer too, and I find it is very good for the simple reason that it does not produce fog. If you use the pyro or ferrous oxalate you will find that if you expose your dry plate underneath the negative in the ordinary way that you will get more or less fog. Of course that does not happen with a chloride plate, but when you have an ordinary bromide plate it certainly does.

Mr. BELLSMITH, of the Eastman Dry Plate and Film Company, of Rochester, then gave a demonstration of stripping films.

Mr. F. C. BEACH: I have a shutter here which is intended to go into the place occupied by the diaphragm. It is mounted on a flat piece of brass which forms a back to hold the disc operating the shutter. The shutter is merely a round disc of metal fastened by an arm to a wheel or disc about two inches in diameter. The novelty in this particularly is the escapement or catch for letting off the shutter, and also for adjusting it to make a time exposure. It is very simple and very certain. It is nothing more than the escapement which you see in a clock, and is divided in the centre, the lower knob being fastened to a little lever, and as you move this arm to the right or to the left it allows the lower leg of the escapement to catch the projection on the drum at the back of the disc, in which is a special spring which operates the shutter, and that spring is made strong or weak according as you turn the pointer on the back. To operate the shutter you turn it around as I have indicated, and you will see the movement. It simply goes and returns. To make a time exposure you simply move the upper lever to the further pin and compress the bulb, and then by releasing the bulb the shutter impinges there [indicating]; by again releasing the bulb it closes so that you can make them as rapid or as long as you hold it. There is nothing about it to get out of order, and it has the advantage of working between the lenses, and by a peculiar movement it allows more exposure to the foreground than to the sky. The escapement part is the invention of Mr. Gregg, and that is the main improvement. The other part of the shutter is patterned after the Grimstone shutter which is sold in England.

Mr. FISK then exhibited a London made camera, remarking,—There is no doubt at all in my mind but what America can build better yachts, or at least faster ones than England; but certainly England can teach us how to make cameras.

The meeting thereafter adjourned.

Correspondence.

THE HISTORY OF PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In my forthcoming book on *The History of Photography* I believe Mr. B. J. Snyce will find that I have done full justice to his important discovery of collodio-bromide emulsion in 1861. The title of my article in your issue of November 4 was *The History of the Gelatino-bromide Process*. In anything like a general review of the progress of photography I should have drawn marked attention to Mr. Sayce's claims.

With reference to Mr. W. H. Harrison's inquiry, just at present I am unable to refer to my books, but I believe Gustave le Gray's book was published in France in 1849 (English translation appeared in 1850). Halleur's book was published in Germany a year or two later, and an English edition also appeared (see my *Bibliography of Photography* for details of the English editions).—I am, yours, &c.,

W. JEROME HARRISON.

Science Laboratory, Icknield Street, Birmingham.

DEVELOPING EXPERIENCES.

To the EDITORS.

GENTLEMEN,—I have been experimenting with the modification of Beach's developer incidentally referred to in your article on the *Responsibilities of Plate Makers* in the *JOURNAL* for November 4, and as the results may be interesting to yourselves and readers I give them herewith.

I first of all made up a quantity of the solution strictly in accordance with the proportions given, using hot water to expedite the solution of the salts, sufficient being added to make up the bulk to ten ounces. On cooling, the greater portion of the ferrocyanide crystallised out, and I found that the addition of two ounces more water was necessary to redissolve the deposited crystals and to retain them in solution.

I now proceeded to develop two portions of a roll of Eastman's stripping film, which had been exposed on the same subject under identical conditions as to light, stop, and duration of exposure. One I developed with Beach's normal potash developer and the other with the ferrocyanide modification. The amount of pyro solution was the same in both cases—one drachm. Of the normal potash solution I used half a drachm, which was amply sufficient for a rapid development of the picture. Using a similar quantity of the ferrocyanide modification no trace of the picture was visible after five or six minutes immersion, and I found that further additions, amounting in all to one and a half drachm, were necessary to complete development. I can detect no material difference in the colour of the resulting negatives, which I send for your inspection.—I am, yours, &c.,

EXPERTO CREDE.

PHOTO-MICROGRAPHS AT PALL MALL.

To the EDITORS.

GENTLEMEN,—Mr. Pringle is quite right, your columns are not the place for a discussion on bacteriology; but I should like to say this one word, that at the very pleasant chat with Mr. Pringle all I "admitted" was that I had not read Dr. Klein's book *Micro-organisms*, or Dr. Crookshank's more recent one. I do not admit that I know "nothing whatever about it," for I know very surely from my general (and special) reading that when I read Dr. Klein's book, as I mean at once to do, I shall be familiar with all the arguments he puts forth. If I get converted from the error of my ways, and turn to the light that is with Mr. Pringle and his apostles, I will confess it with alacrity.

By "the beautiful and artistic" I meant *artistic truth to nature*, but when she is ugly or uninteresting I don't want to photograph her. In such objects as I exhibited at Pall Mall I mean, therefore, more than ever to stick to the "artistic and beautiful," or, in other words, "pictorial effect." In physiological work truth to nature may not always, I allow, make "pretty pictures," but I can't believe Mr. Pringle means to limit the meaning of "artistic and beautiful" to "pretty pictures."

I very heartily agree with all of Mr. Procter's letter, and am really obliged to him for it. I only "abandoned the entrenchment" because your columns are hardly the place for its defence. I hope Mr. Pringle enjoyed Mr. Procter's letter, and will—may I say it?—profit by it also.—I am, yours, &c.,

FRED. H. EVANS.

158, Osbaldeston-road, N., November 21, 1887.

¶ P.S.—May I correct a grotesque misprint in my letter of November 4? "Hereditary server" should have been "hereditary sewer."

"ADCOCK" AND "MONITOR."

To the EDITORS.

GENTLEMEN,—Permit me to notice "Monitor's" criticism of my little paper, read at the Camera Club on October 6. Although adverse to my views it is so kindly and fairly put that I have had pleasure in reading it.

It is, I think, possible, the altered circumstances of Trafalgar-square may somewhat affect "Monitor's" opinion of my advice to amateurs "to go and take the sprawling groups to be found there on a sunny day." I am ready to admit the groups I saw there three weeks ago seemed very unlikely stuff for picture making. It is even possible that, had my later experience come to me sooner, I might have thought the impressions made on me in July mere fleeting things that had passed, and too unlikely to occur again, to make recommendation of them a strong point. But supposing the things of which I spoke had not taken the turn they have, or that they again occur next summer, would a camera taking either a group on a bench in Trafalgar-square, or the paviers in Regent-street when closed to all but footway traffic, cause an obstruction? I think not. I think I could have taken twenty shots a-day in either place without any complaint of obstruction or inconvenience to man, woman, or vehicle.

I read with much amusement a description of "Monitor's" experiences in a London street. It would be so new to myself that I think I would like another summer to try my hand, even if I incur some chaff in doing so. The clever, witty fellow "Monitor" met with might be absent. This individual is frequently but not always found, and without him the fun caused at "Monitor's" expense might not be forthcoming. If I am wrong in thinking the difficulties of getting shots are less than "Monitor" found I shall be glad next autumn to say so. But even then I shall cling to the opinion long held, that true pathos may be got into a photograph by picking up the models the streets afford, and, after considering what can be done with them, doing it. *Where?* is another question. It is a debatable one. It would be made easier to the members of the Camera Club had it on its premises any den with a top light, large enough to hold a sitter, a camera, and an operator. Assuming one half or more London amateurs live in the suburbs, it seems likely they possess a piece of back-yard or garden. Here is a studio. For twenty years I photographed the figure in nothing better than the shade given by a south wall, and that can be got at most suburban houses. If the figure have any charms, the amateur may study it there; if not, let him pursue view-hunting and put his own value on results.

My aim in another respect, I think rather misunderstood by "Monitor," if, as I suppose, he thinks I would set up a camera and take, under all circumstances, a subject where I found it, he has misjudged my meaning, or I have said what I meant not. There are materials in the streets I would not accept off-hand, focus them, and take them. No; I would rather consider them, negotiate with them, and make them what I wanted. If in the Strand I saw a picturesque flower-girl, would I think it essential I should take her there? Certainly not! Telling her what I wanted, I would induce her to go to one of the quiet by-streets and pose as a flower-vendor there. I would pay her better for doing it than she would get paid by refusing. I would even ask a passer-by to aid a better picture by seeming to be a customer for her flowers—that is, just for the minute necessary to snap the picture.

I am even at issue with "Monitor" as to the impossibility of getting a child, a dog, and a doorstep, into a picture, under such circumstances as would speak a language to the onlooker, if not as powerful as that rendered by the artist, a lesser sermon on the same theme, but not in Seven Dials or the slums.

I am, gentlemen, about to send to you, with the request you will give them to "Monitor," five $7\frac{1}{2} \times 5$ studies, taken last week. I met a poor chap who has often been to me a model, looking pinched and pined. I told him to come to my *atelier* the following morning. In the meantime I thought over a few subjects, put half-a-dozen plates into my dark slides, and on the morrow, in less than one hour, I had exposed five plates, five seconds each, by my Dallmeyer IAA rapid rectilinear (open lens); and my sitter, poor Topey, had filled my water-tank and gone away to get a decent meal. In the evening I had pleasure in developing these plates. They are nothing, have no intrinsic value; but I prefer them to views, and I took them in less time than I should be hunting for one, even if near home. To indicate to your readers the subject of these prints, I send the

titles, I call them by—1, *Enforced Idleness*; 2, *Private Affairs, urgent*; 3, *Brooding*; 4, *Thinking, hardly of others*; 5, *Prospects brightening*.—I am, yours, &c.,

Melton Mowbray, November 21, 1887.

WILLIAM ADCOCK.

Exchange Column.

- A 12x12 studio camera in exchange for whole or half-plate tourist camera and slides.—Address, S. GRANT, 419, Kingsland-road, E.
 Wanted, whole or half-plate apparatus in exchange for fifty-four-inch bicycle as good as new.—Address, C. HAWKINS, 37, Tunis-road, Shepherd's Bush.
 Wanted, whole-plate portrait lens in exchange for a magic lantern, a 7½x7¼ camera, and a quarter-plate lens and camera.—Address, JAMES DENTON, 70, Sheffield-road, Barnsley.
 A quantity of quarter-plate negatives, mixed subjects, suitable for printing lantern slides, in exchange for some slipping slides or quarter-plate negatives of other subjects.—Address, R. J. SHEERMAN, 147, Clarence-road, Lower Clapton.

Answers to Correspondents.

PHOTOGRAPH REGISTERED:—

H. MOWER, Birmingham.—*Photograph of twin children born at Camden-street Birmingham, joined together at the stomach.*

THE THISTLE.—By a mistake, discovered too late to be rectified in time, the illustration we gave last week was entitled *The Thistle*, instead of *Yachts on the Clyde*.

J. LESTER.—The requirements for silvering mirrors may be had at any chemist's.
 F. B.—By adding cyanide of potassium the precipitate ought to be dissolved; if not, filter it out and use the clear solution.

J. ADAMS.—In stating that the yacht picture by Mr. Hyslop which we published last week was the *Thistle*, we were unwittingly guilty of an inaccuracy. It was not the *Thistle*.

COLLO.—1. No work specially devoted to the subject of collotype has been published in this country.—2. Either the ordinary lithographic press or that used for letterpress printing may be employed.

LUX.—By inserting a plano-convex lens between the condensers and the light a great addition to the illuminating power will result. Either of the lenses mentioned will answer for enlarging a portrait.

AN OPERATOR suggests that principals and operators in establishments where a number of hands are employed should take up a subscription for the Jennings's Fund. "Photographers," he says, "as a rule, I am afraid, too often forget how much they are indebted to scientific amateurs who freely publish their results."

N. W.—It is by no means uncommon for a difficulty to be experienced in getting the chloride of silver precipitated from the washing waters of ready sensitised paper to subside. If, however, a little nitric acid be added, and the whole vigorously stirred up, the silver will then subside quickly. Hydrochloric acid is better than salt for precipitating the silver from washing waters.

WOODVILLE GRAY.—1. We scarcely understand your query, as you do not say the kind of transfer you require. We, however, presume you mean one for photo-lithography; if so, we cannot understand why the lines in the negative, which ought to be black in the transfer, came white on a black ground, and when you used a transparency, still got blacks where there ought to be whites, and vice versa. For photo-lithography vigorous negatives with perfectly clear lines are essential. The property of bichromated gelatine, or albumen, after exposure to light is to render it non-absorbent of moisture, hence the fatty ink adheres to those parts while it is rejected where moisture is absorbed. Therefore a positive cannot be used to get a positive image—it must be a negative.—2. The cause of the gelatine splitting off is that the plates were over dried, thus causing a too powerful contraction of the gelatine.

J. R. G. writes: "1. Will you please tell me the best method of mounting prints on calico or other fabrics?—2. I have bought a wooden studio twenty-four feet by nine feet, and seven feet six inches high to the eaves; it has eight feet of glass on top both sides, also eight feet along sides, but it does not come to the bottom by two feet (glass all at one end of the studio), and I would like you to tell whether it will be necessary to have it altered or not. If so, where should glass be placed?"—Reply: 1. Strain the calico on a wooden frame, damp it, and then mount the print upon it with starch in the same way as you would on cardboard.—2. The glass need not be lower than it is. We should, however, advise you to alter the position of the glass, bringing it more towards the centre of the building, starting it, say, about four feet or four feet six inches from the end, as you will require about this to be opaque over the sifter. Perhaps the simplest plan will be to add about this space on to the length of the studio, making it opaque. The glass will then be in the right position.

EBBW VALE.—[But that we know that the following is genuine we should have treated it as an attempted joke.]—"Will you kindly give me your opinion on the following in your next 'Answers to Correspondents' under the *nom de plume* 'Ebbw Vale'?" A friend who possessed six unopened rolls of Eastman negative paper (7½x5) for which she had no use, and which she could not otherwise dispose of, sent them to a refiner, together with ten unused glass plates of the same size, the original cost being, six rolls at 8s., 2l. 8s.; plates, say, 4s. 6d.; total, 2l. 12s. 6d. She paid carriage, and received from the refiner 2s. After hearing so much of the way in which competition has reduced the price of plates, &c., to within a fraction of their cost price, does not this look as if the refiner was making too good a thing of it?—We wonder, if our correspondent had sent his lenses to the nearest metal founder to be utilised as old brass, would he complain that the sum received bore an astonishing disproportion to the cost price? We are truly surprised that so much as 2s. was realised after the expense of reducing.

J. H.—Mr. Hyslop employed a single landscape lens. We are unaware of the nature of his camera, but bear in mind it is the *man*, not the *camera*.

CITIZEN wishes to know how to write on the negative.—We presume he means so that the inscription appears white on the print, the same as in the case of the titles on the published photographs of scenery. This is done by writing in the names neatly with a sable pencil charged with black varnish. To increase the opacity of the varnish it is sometimes exposed to the air in an open vessel for a day or so, for a portion of the solvents to evaporate before using; or a little lampblack may be added to thicken it.

PIERRE REYON (Banquier à Gray) asks: "1. What would be the best way to revive prints with the silver salts turned completely yellow—(a), on the supposition that they can be removed from the Bristol boards upon which they are mounted; (b), in the event of not being able to remove them from the cards on which they are mounted?—2. For enlargements not exceeding 10x12 (English measurement), what would be the best paper to use, 1 or 2? and which of the three sorts that they sell would be preferable?"—In reply: 1. There is no satisfactory method of restoring faded prints. The yellowness may, however, be removed by immersing the prints in a dilute solution of bichloride of mercury. For this treatment the prints should be removed from their mounts. If this cannot be done a pad of blotting-paper moistened with the mercurial solution may be laid on the print and the whole put under pressure till the tint is removed, then fresh blotting-paper wetted with clean water must be applied to remove the free bichloride. But this treatment is not to be recommended.—2. There is not much to choose between them. Perhaps No. 1 has the largest sale. The kind selected is much a matter of taste; the rough surface yields the most artistic results. The others have a glossy surface.

ROBT. STEWART asks: "Might I ask you to answer the following queries?—1. What is a fair price for a business with a turnover of 300l. per year?—2. Does the price include any apparatus or fixtures or negatives?—3. In strengthening the acetate of soda toning bath, what proportion of acetate to gold do you add?—4. What lens would you recommend for 20x16 direct portraits in the studio—a Voigtlander's Euryscope, a rapid rectilinear or symmetrical, or a portrait lens pure and simple? Of course, if an equally good lens for portraiture could be had that would also take a view, so much the better, but I should not care to sacrifice quality of portrait for this."—1. This is a purely business matter, and we can offer no opinion. Perhaps some of our readers, better informed on the subject than we are, will give their ideas.—2. This, of course, is a matter of arrangement between buyer and seller.—3. It is not necessary to add acetate of soda every time gold is added. A little fresh acetate now and then is all that is required.—4. Either of the lenses named will do quite well for portraits, and for views as well. The only advantage possessed by a portrait combination is its large aperture, and, consequently, greater rapidity in working. It will yield no better picture. If a portrait lens be stopped down to the same ratio as a lens of the "rapid" type, it will then only have the same degree of rapidity.

A CORRESPONDENT writes: "I take the liberty of calling your attention to the remarks made on page 723 of this week's issue of the JOURNAL, on the copyright case against Messrs. Tuck & Sons. You there state, in giving the judge's decision, that the plaintiff failed through improper registration. This was so. But, having carefully read the evidence, I apprehend that the plaintiff was not suited owing to the sifter having erroneously declared Mr. Goodman as the author of the photograph, whereas it was proved in evidence that Mr. Goodman's assistant, one Sheidt or Suetit, had actually taken the photograph, and was therefore the legal author. It was solely on this point that the judge gave an adverse decision as against the plaintiff, and distinctly stated that he would give no opinion on the other contention as to whether payment or not had been made for the taking of the second negative, and this on account of the conflicting evidence offered. This I think puts a totally different complexion on the result of the trial to that summarised in your article, and in no way interferes with the accepted theory that where payment is made the copyright of a photograph vests in the sifter. In a word, the case in question shows the necessity of a correct declaration being made at the time of copyrighting a photograph. If you agree with my view of the case, perhaps you will kindly refer to it in a future issue of the JOURNAL, as the subject is a most important one."

RECEIVED.—Report of annual dinner of Cardiff Society.

PHOTO-MICROGRAPHY ON THE CONTINENT.—*Errata* in page 727: line 2, read Duboscq for Dubosog; line 48, Nacet for Nechel; line 52, Rafter for Raftio.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday next, the 1st proximo, a paper will be read by Mr. F. A. Bridge, subject, *Spots in Silver Prints*.

THE JENNINGS'S FUND.—The following additional sums have been received:—C. H. EVANS, 12s. 6d.; Francis Fowke, 1l. 1s.; Professor E. M. Crookshank, 5l. 5s.; A. Rivot, 5s.

PHOTOGRAPHIC CLUB.—Opening lantern night, November 30, 1887. This evening will be devoted to the lantern exhibition, music, &c. There will be no discussion. A limited number of admission tickets. Apply to the Hon. Secretary.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1439. VOL. XXXIV.—DECEMBER 2, 1887.

PHOTOGRAPHERS *VERSUS* REFINERS.

If there be a body of traders with whom photographers do not appear to be on satisfactory terms it seems to be the refiners. Periodically we receive a considerable amount of correspondence complaining that refiners have not remitted such an amount, in return for the residues sent for reduction, as it is supposed they ought to have done. These complaints usually reach us about this season, probably for the reason that as the dark days set in, photographers and their assistants have plenty of leisure for the collection and preparation of the wastes which have accumulated during the more busy part of the year.

Two letters on the subject are now before us: one is from an old and experienced professional who complains that, twenty years ago, he used to receive nearly half as much more for every pound weight of residue he sent than he does now. He adds that at times he has sent them to different houses, but the returns have, in each case, been about the same. Sometimes a statement, which he never understood, has been sent, but not always. The second correspondent says in effect: I sent to a certain refiner, whose name he gives, a large parcel of wastes, consisting of spoilt prints and paper cuttings; also a lot of toned and finished prints which must have contained a considerable quantity of gold, together with a jar full of chloride, as thick as cream, from the washing waters. He adds, the paper alone must have weighed nearly half a hundredweight, and the return was so insignificant that I am thoroughly disgusted. Surely such a quantity should have yielded a handsome sum. Our correspondent asks, Would it not be better for photographers to reduce their own wastes, and thus make sure of obtaining their full value?

From these letters, which are similar to others which often reach us, evidently many who do not give the matter due consideration, are under a misconception with regard to the value of residues. Take the latter case for example. The probable weight of the waste is given, but not the sum received in return. If these were known it would give one no idea as to whether it were fair value or not. Half a hundredweight of paper when reduced to ashes would not weigh much, and the amount of silver they contained would depend entirely upon the strength of bath used for sensitising. It may be taken for granted that the fixed prints contained less than five per cent. of the silver with which the paper was originally sensitised. Had our correspondent burnt the paper, dried the chloride, and then passed the whole through a sieve, he would probably have been greatly surprised at the smallness of the bulk remaining; yet it contained the whole of the silver.

When the residue is in a homogeneous condition, any one

with but an elementary knowledge of chemistry can make a rough assay, so as to arrive, approximately, at the quantity of metal that ought to be recovered. Had this been done the return would, doubtless, have given greater satisfaction. The refiner had, of course, to burn the paper and dry the chloride before it could commence the reduction, and doing all this added to the cost of the work. Our first correspondent we know always does this, and his complaint is that, weight for weight, he gets so much less of late than he did a long time back. This may, however, be satisfactorily accounted for if we consider the conditions then and now.

Twenty years ago the paper, as a rule, was sensitised on a solution at least twenty-five per cent. stronger than is customary now—in the case of the ready sensitised paper the difference is still greater—consequently the ash was proportionately so much richer in metal. But this does not fully account for the wide difference. If we refer back to the market value of standard silver twenty years ago we shall find that it was about five shillings an ounce, but now it is something less than three shillings and eightpence. When these two facts are taken together, it will clearly be seen why the return made for each pound weight of ashes is so very much less now than it was formerly. Some persons, without thinking of the matter, are inclined to estimate their residues—as the correspondent just quoted did—rather by their bulk or weight than by the quantity of the precious metals they contain and their value.

If the bulk of the waste be very large and the proportion of metal very small, it may not actually pay for its recovery. We have before now seen a large sheet of thick, coarse, brown paper thrown amongst the waste simply because it showed several splashes of silver solution. Now, in this case, the paper probably did not contain half a dozen grains of silver, while its ashes most likely, from its common quality, weighed an ounce or more. Clearly, in this instance, it would have been more profitable to have discarded the paper altogether; or, if excessive economy were studied, the stained portions might have been torn out and the remainder rejected. We have also seen large numbers of finished prints, mounted on stout cards, added to the wastes; this is certainly false economy.

Opinions differ somewhat as to whether it pays to recover the metals from toned and finished prints and their cuttings. Some idea on this point may be arrived at from an experiment conducted by Mr. William Bedford a few years back. From half a hundredweight of toned prints he succeeded in recovering thirty-five shillings' worth of the precious metals, and out of this sum the cost of collection and reduction had to be deducted.

As a guide to those about to collect their residues we would

say, Burn the paper as completely as possible, first by burning it in a stove, then collecting the ash and again incinerating it in an iron pot—an old saucepan will answer—for some hours over a brisk fire, so that it is reduced to a compact pale greyish powder. Dry the chloride from the washing waters, and the sulphide from the fixing baths, in the kitchen oven, and rub them up in a mortar. Then pass the whole through a coarse sieve—a cigar box with the bottom removed and replaced by a piece of perforated zinc will serve very well as an extemporary arrangement. When this is done it will be surprising the quantity of heterogeneous matters, in the shape of broken glass, nails, pins, &c., which are arrested on their way to the crucible.

There is no advantage whatever in keeping the different residues apart unless the quantity be large, except in the case of the gold residues—these should always be kept separate. When residues are treated as above, and are sent to a respectable refiner, the return will invariably be satisfactory; such, at least, is our experience.

ON RAPID DEVELOPMENT.

A CORRESPONDENT whose letter will be found in our correspondence columns utters a note of distress which, we doubt not, will be echoed by many another reader of these remarks. He has a large number of dry plates, exposed possibly during a summer tour of prolonged duration, and now he has to face the difficulty of developing them within a reasonable time before his interest in them is gone, or perhaps the time comes round for another tour. To some extent, the presenting this letter for perusal may serve as a warning to those whose constant practice when out photographing is to expose all their plates before the day is over, quite regardless whether or no they are likely to obtain a set of negatives worthy of being printed at all. We have constantly reprobated such a plan of procedure, for if the art be worth practising it is surely worth while to make the production of each negative a subject of some little study and thought. But not to moralise in a direction where a special temptation presents itself, we will discuss possible methods of aiding others besides our overwhelmed correspondent.

In the first case, ten minutes is really an unnecessary length of time to spend over developing a single negative which is assumed to have received about the correct exposure. We will not here enter into the various questions that might at once be raised on our assertion; we merely say that so long a time is not necessary under the circumstances.

It goes without saying that, unless the exposure is practically an assumed success, development will be started with a smaller amount of ammonia in the solution than the plate will bear; but it may be pointed out that it does not follow from this fact that the proportion must necessarily be excessively small. Taking what may be termed a normal developer for a given plate, to contain two grains of pyro and four minims of ammonia, with a little bromide to each ounce of water—and this is an average proportion—it would, unless the exposure was utterly unknown or uncertain, be a throwing away of time to start with less than one-fourth that quantity of ammonia whenever there was a fair number of plates to get through. The better plan would be to use half or one-third the quantity of the normal proportions of ammonia and thus leave ample margin for over-exposed plates while enabling under exposures to be readily combated. A little judgment here may save half

the time that would be needlessly expended under an imperfectly devised method.

We do not, of course, leave out of sight the great variation that is to be found as regards ease of producing density among the different brands of plates now in the market, but most plates properly treated will, nowadays, answer the developer with a fair amount of rapidity. There is, nevertheless, a very great difference even yet in their quality in this direction, and the photographer who, with a large number of negatives before him, finds himself in possession of a batch of plates that will take the maximum time for attaining intensity is truly to be pitied.

A two-grain to the ounce solution of pyro is a very common strength of developer—one leaving sufficient margin either way for reduction or increase; but, where rapid development is needed, this strength may be greatly exceeded without perceptible ill effect with a marvellous shortening of the requisite time. Many plates are now made capable of sustaining without injury the action of developers of six, eight, ten, and even more grains of pyro to the ounce, and the increased rapidity of procedure thus obtained is almost startling. But it must not be lost sight of that an increased expenditure is thus entailed.

The effect of increase of temperature in accelerating development is not sufficiently marked to render it worth while undergoing the risk of frills and blisters in the endeavour to save time. There is, however, another very simple method of encountering the difficulty, involving only the purchase of a few extra dishes and the possession of a quick hand, eye, and judgment. It is merely to develop a large number of plates at once. We have not heard of the practical adoption of any method of developing several dozens at a time in a single grooved trough with a very weak developer—a method we do not see any difficulty in carrying out; but we have seen a large number of plates developed at a time, each in its own dish. Our correspondent's purpose would perhaps be served if we gave him a description of the development of about a hundred half-plates as witnessed by us in the dark room of a well-known professional photographer.

In the first instance ten dishes were laid out side by side over the large sink; then fifty ounces of developer, containing, we understand, two grains of "pyro," one minim of ammonia, and half a grain of bromide of potassium in each ounce, were mixed, and five ounces placed in each dish. On a shelf immediately in front were three bottles containing respectively strong stock pyro solution, mixed ammonia and bromide solution, and ammonia solution the same strength but without the bromide. All being ready the dark-room assistant handed him, one by one, the ten plates, which were then carefully placed in the dishes. The image soon began to appear, and our friend at once became too busy to attend to any conversation. As soon as a plate was considered dense enough it was put under the tap, slightly washed, and immediately transferred to a grooved trough containing a solution of chrome alum and citric acid. A new plate was immediately handed to him, and placed in the empty dish, which was then not allowed to remain where it stood but was placed at the left end of the row. We were surprised to find the negatives develop so uniformly, but soon one appeared which was apparently under exposed. The dish containing it was transferred to the right end of the row, and plain ammonia solution added so as to double the existing quantity. That sufficed to bring the image up completely. Every now and then, as the plates were being passed through, the rule of new plates to the left and underdone

plates to the right being uniformly adhered to, other unexposed plates took the place of the first named, and after a while there were two dishes to the right with stronger ammonia solutions. Ultimately there were three dishes, the third placed to the extreme right and containing four minims of ammonia to two of pyro, that being the limit—with the particular plate—beyond which we were given to understand no gain was experienced by further increments of ammonia. In a very short space of time, comparatively speaking, the whole century of plates was developed, though after an amount of exertion and close attention which we should imagine would be very fatiguing if persisted in for long. There is no need here to follow the plates in their after treatment, it suffices that we have given a thoroughly practical answer to our correspondent's query, and we may say that the narration of the experiences of a few others in a similar direction would be a valuable contribution to practical photography; and we venture to express a hope that we may receive particulars of a few such practical illustrations, which we may print for the benefit of our readers generally.

AGAIN have we to record the death of one who some years ago was well known to photographers. Mr. J. B. Dancer, of Manchester, died on the 24th ult. He was born in London on October 8, 1812, and may thus be said to have attained a good old age. He was born an optician, as both his father and grandfather were makers of optical and scientific instruments. Some account of his career will be found on another page.

In connexion with the alleged dynamite conspiracy, it is reported that one of the incriminated persons was photographed without his being aware of the fact, and that his portrait has been largely circulated and identified. Photographing suspected persons outside the prison walls without their being aware of it, is certainly a novelty to many. It says much for the astuteness and skill of our Criminal Investigation Department if they, unknown to the suspected, can secure portraits of them sufficiently good to serve as a means of identification. Only those who have really attempted to obtain an instantaneous portrait of any particular individual—especially one who was so erratic in his movements as the accused appears to have been—while walking through the streets under the conditions mentioned, can appreciate the difficulties to be encountered. We are of course assuming that the portrait was taken in the street, for it is difficult to conceive that it could be accomplished elsewhere without the knowledge of the "sitter." If the report be correct, which many will doubt, it will be gratifying to find that "detective photography" can be so successfully applied by our detectives.

DURING the past year or two, and prior to the introduction of stripping films, a considerable number of negatives were produced. Now, in printing from these in the ordinary way, the granularity of the paper in most instances does not show to any material extent. But it frequently happens that enlargements are required from them; then the case is different, and the grain of the paper sometimes becomes very palpable in the finished picture. It may not be generally known to amateurs who make their own enlargements that this defect may, to a great extent, if not entirely, be overcome by making the enlargement with the lens a trifle out of focus. It is a curious circumstance, that if the lens be judiciously put just a little out of the actual focus, the distinctness of the granularity of the paper may be destroyed without materially interfering with the apparent definition of the image. A little experience will determine the amount the lens should be put out, because it is manifest if it be too much the finer details of the picture will suffer.

NOTWITHSTANDING the stringent wording of the new Fraudulent Trade Marks Act and its heavy penalties, there can be no doubt that the law is being evaded—ignored would perhaps be the more correct term—and, so far as we are aware, no prosecution has yet been insti-

tuted, certainly not in connexion with matters photographic. We know that foreign made lenses, bearing the names of English houses, are being sold the same as they were formerly. Also, that chemicals, mounts, albumenised paper, and other photographic goods, are still being imported and sold as being of home manufacture, if not upon actual statement, at least by implication. When this Act was first passed it was thought that a severe restriction would be put upon this class of business, but this does not appear to be the case to any great extent. Up to the present, so far as photographic materials are concerned, the Act appears to be, practically, "a dead letter." Still dealers need be on the alert.

AMATEUR photography, that is for outdoor work, may now be considered as over for the season by the majority of workers. Some will, no doubt, obtain a few negatives of winter effects, but tramping about with the camera in snow and wet in search of the picturesque, and when it is found often having to wait for a suitable light, is not an agreeable occupation, even to the most enthusiastic. The majority of the negatives of outdoor subjects that are taken during the next few months will be taken, we surmise, not far from home, and their numbers will be limited. However, there is no reason why amateurs should let their favourite pastime be in abeyance, for there is really plenty of agreeable work that can be done indoors. For example, home portraiture, making lantern slides either by printing direct or by reducing them in the camera from larger negatives. Enlarging or printing on bromide paper; this can as well be done by artificial as by daylight. Photo-micrography is also an interesting occupation, and, for popular objects, requires no very expensive appliances or more skill than is possessed by the average amateur. For the larger objects many of the shorter focus photographic lenses may be successfully employed. Making transparencies for window decoration may also form a winter occupation; this also can be done by artificial light.

COPYING engravings and other works of art, either for scrap-books or for framing, can be done indoors during the winter months. In this work the negatives will prove more suitable if they be developed with ferrous oxalate instead of pyro. Negatives from this class of subject if printed in platinotype or on bromide paper will yield impressions very closely resembling the engravings themselves. In printing subjects of this character, the negatives may be masked so that the prints are obtained with clean margins of suitable width; then, if the picture be framed, no mounting is required, while, at the same time, it will more closely resemble an engraving. Many other directions might be indicated in which photography can be worked during the winter months, but sufficient has been said to show that the amateur need not throw his favourite hobby aside entirely at this season.

THE facts of nature are sometimes too strong for the logic of invention, and a reference to *Symon's Monthly Meteorological Magazine* for October will show the bountiful way in which London has been supplied with atmospheric moisture. Of all the meteorological stations in the British Empire, we learn that the palm for dampness has to be given to the Metropolis of this country.

In his recent paper on *Orthochromatic Photography* (see our issue for November 11), Mr. J. B. B. Wellington mentions that "one great advantage of orthochromatic plates (in conjunction with a yellow screen) is photographing outdoor subjects on a slightly foggy day; the result on an ordinary plate being flat and foggy, on the orthochromatic crisp and brilliant." This experience would indicate that orthochromatic plates should be of great advantage in the studio at this season, especially during a yellow fog. It is seldom during the daytime that the light is so bad that a fairly well exposed negative cannot be obtained, on a rapid dry plate, in a similar time to that which frequently had to be given in the collodion days; but the negative so obtained is, usually, spoilt through a lack of brilliancy arising from the mass of fog intervening between the sitter and the camera. If orthochromatic plates will overcome this difficulty they will prove a still greater acquisition to photographers. Used under these conditions, we presume, the yellow screen will not be required, the colour of the light supplying sufficient yellowness. The thing is well worth trying when sitters have to be taken in a November light.

THE preparation of orthochromatic plates, suitable for the above purpose, by the photographer himself is a very simple affair, all that is necessary being to bath the plates in the "orthochromatising" solution and then rear them up on the dark room shelves to dry. Prepared over night, if the dark room be a tolerably warm and dry apartment, the plate will be dry and ready for use by the following morning. Plates thus prepared will usually remain in a good working condition for several weeks.

PLATE BACKING.

I WAS greatly interested a little time back by the correspondence in these columns with regard to the backing of plates, the subject being one in which I have taken great interest, practically and theoretically, for a long time past. I am aware that a large number of photographers never have seen the need for anything of the sort, and to them, of course, any discussion of the matter would be uninteresting; but it may be safely asserted that every photographer who has any experience of varied subjects has produced some negatives that would have been the better for a backing of some sort. For astronomical photographs it is an essential condition in the production of good work; for landscape pictures some views could not be taken successfully without backed plates, and the same remark is to be made of interiors; while, in portrait work, given a sitter in a very light dress, and under a strong illumination, and taken with the full aperture of the lens, a single trial only is needed to show the inferiority of unprepared plates. A great deal will depend upon the make of plate employed. Some brands have enjoyed an honourable distinction in freedom from halation since the very early days of gelatino-bromide, while others equally have, to those who have given thought to the subject, been known always for the readiness with which they permit halation. The introduction of iodide into the emulsion was a great improvement in regard to preventing this evil; the introduction of machinery for coating was not an unmixed benefit, for it may be safely asserted that a machine-made plate on the average will, *ceteris paribus*, have a thinner film than one coated by hand. Of course, unless the due quantity of silver be employed it will not be in the film to give opacity, let it be coated by hand or machine.

To avoid halation, or rather to reduce it to a minimum, it is always advisable to choose a plate with a thick coating; the yellower in colour the better, I am inclined to believe. I speak advisedly in saying a "minimum of halation," for the plate is not made nor the backing invented which will, under all circumstances, prevent light action in dark places immediately contiguous to bright lights, as any one can quickly discover by putting a plate, prepared his best to withstand halation, to a crucial trial.

The cases where, in my own practice, I prefer backed plates are, in portraiture, where there is any large mass of white; in landscape or architecture, almost always; in interiors, invariably. A plate may at times be uselessly backed, but that is as nothing compared with the certainty that whatever the subject no trouble that is capable of prevention will arise from halation.

In portrait work my usual plan was to have a piece of dead black American cloth wetted with glycerine squeezed to each plate put in the slides whenever a sitter made his appearance whose costume had a superabundance of white. The plan was most effectual; but it was messy, and there was danger of the glycerine coming on to the film and causing the plates to become glued together. The glycerined plates were put back to back while they waited development, but there was always danger, and the plan was dropped in favour of another. Captain Abney's collodion of aurine or magenta formed a very handy substitute, and has been of great use on many occasions. Once my assistant placed a number of plates so treated into the dark slides directly after coating, before they had had time to dry; the consequence was serious trouble for some time with the slides. The alcohol vapour had softened the shellac, and dried out again, so that a considerable amount of "ungluing" had to be performed before using the slides again.

The most serious drawback was the getting rid of the collodion before developing. In the first place, if the plate had emulsion on the back it was very difficult to remove the collodion at all; and, in the next, if a piece of collodion were allowed to attach itself to the film it was most

difficult of removal, and if not removed it interfered with development, so that when a dozen or two large negatives, each with collodionised back, had to be developed, the washing away of the collodion was no light undertaking. I tried to develop without regarding the film; but the floating particles of collodion which soon made their appearance were quite in the way, and when a second plate was placed in the same solution it became impracticable to continue development. Hence, all negatives were first placed under the tap to flood away all collodion before developing. It was found necessary to moisten the film first to prevent the pieces of collodion adhering, if by chance they were washed over the edge. But the most serious drawback of any was the readiness with which these collodion skins collected in the sink and caused overflows. Twice over did I experience this, and then I felt it was time to try other backings.

One correspondent a little time ago recommended the old plan of the astronomers—a backing of asphaltum. This would answer well for a few negatives, but would be quite out of the question for a professional photographer who had many plates to develop; the time that would be involved in scraping off would be intolerable. Then, again, another correspondent recommended a tube of water-colour paint being purchased, and the contents put to the purpose of backing. A really excellent plan, but exceedingly costly, if, say, a dozen or two eighteen-inch plates had to be treated. The method that yet another gentleman recommended, namely, to take a sketch of a possible window to be included in the view, and to back the plate just there, and there only, is too droll for serious consideration.

The old sienna or lampblack treatment is but a slight palliative, as a small portion only of the particles remain in "optical contact." Any one can easily see for himself the extent to which a pigment touches the plate without an intervening film of air, by backing a piece of clear glass with the pigment to be examined, and, after well drying it, observing the reflection of the sun from the clear surface. There will, of course, be a second image from the back, and the degree of brightness which this image exhibits will be the measure of the imperfection of contact between pigment and glass. Still, a pigment backing appeared to offer most advantages, and a large number were tried.

The backing of pigment mixed into a paste with gum water and glycerine, as described in a leading article in THE BRITISH JOURNAL OF PHOTOGRAPHY a few months ago, has answered my purpose admirably; nothing better could be wished for. It is easily made, easily laid on, and very easily removed. A good plan after making a quantity by rubbing up with a palette knife upon a slab of glass, is to squeeze the paint through a piece of fine muslin: it makes so much pleasanter a paint to lay on, and ensures a greater perfection of optical adhesion.

As a matter of practice, I now always have a number of plates ready backed for any studio work that may require it, and for outdoor work, where it is never known exactly what kind of subject may need to be thrown on the focussing screen, backed plates are always employed. Some may call this excess of precaution, but as the whole operation of backing and removing is performed in so brief a time the slight extra labour is worth undertaking, if only for the peace of mind it entails. The whole backing from a twelve by ten plate may be washed off in a very few seconds without danger to the film, or to sink arrangements, as with collodion.

For all practical purposes of everyday work this gum and glycerine paint is the best it is possible to employ, but, as I said at the outset, perfect prevention of halation, even with this backing and the best plate in the market, is not always possible. If the nearest approach to perfection be looked for the plates must be stained also, but this branch of the subject cannot be now dealt with.

G. WATMOUGH WEBSTER, F.C.S.

"ON PAPER" PHOTOGRAPHY.

EVEN the worm, saith the venerable adage, will turn. This is not correct, but it is well-meaning as we all know. When a man is unfairly ridiculed *coram populo* it is only natural that he should, courteously or not, retort, as witness the case of Mr. L. Sawyer, also that of Mr. Robinson. A great many outside newspapers have "done" this year's

Pall Mall show, but some of them have not got through the task so successfully as one might wish. The *Builder*, in particular, seems to have been strangely maladroit, if not absolutely incomprehensible, in many of its remarks. Mr. Heathcote Statham is, as some of us are aware, a fierce partisan, much prone to making architects and others of that ilk uncomfortable; but in the case under notice he would have done better to have stuck to his T-square. It may be doubted whether his predecessor, Mr. George Godwin, would have penned or passed such butchery.

The esteemed organ of the architectural and building professions, however, sins in reputable company. There is an influential morning paper which sometimes treats its million readers to a photographic "pot boiler." Recently when referring to Mr. W. H. Mallock's suggestion as to the more extended employment of instantaneous photography by the Irish Executive during the present unhappy crisis, this same paper gravely propounded, *inter alia*, the following choice and learned riddle: "Whether the art of focussing will ever be brought to such a degree of perfection as to prevent a gentleman's hat when held in the foreground of a portrait from looking about three times the size of his head!" After a lot more inconsequential padding, *à la* "the art of focussing," it complacently proceeds to assure us that "the very finest instantaneous photographs will only give the general aspect of the scene delineated by the action of the solar rays, and that such a photograph is usually, in parts, so blurred and confused as to require a large amount of touching up before it is fit for public inspection." If the first part of this remarkable enunciation means anything at all, the Gregorian calendar, in the estimation of the practical photographer quoted by the leader writer, is seriously wrong, and instead of this being, as all of us believed, the year of grace one thousand eight hundred and eighty-seven, we must subtract ten, and then we shall be right. As to the amazing indictment that "the very finest instantaneous photographs are . . . usually in parts so blurred that," &c., this is contradictory and nonsensical drivel. One wonders if this amusing leader writer ever uses his eyes when he passes Mr. Spooner's shop or if, when he went to Pall Mall, Mr. Cocking wickedly covered up Mr. England's exquisite little excerpts of Metropolitan animation, or Mr. Cobb's bold transcripts of daily life in the great capital. These prints, so far as I could see, are untouched, and so, I imagine, are the negatives. In any case, and whether they are or not, the wholesale insinuation in a widely circulated daily newspaper, that sharp, well-defined, instantaneous pictures may not be obtained without touching, is as ignorant as it is silly, and deserves to be well laughed at, as no doubt it will be.

Photographers are treated to a deal of scolding and abuse from art journals, and any amount of rightdown misrepresentation and falsification on the general press. Probably nothing is so thoroughly well misunderstood in this country, among outsiders, as photography. The ignorant sit in judgment upon it with delicious self-confidence, the unthinking diagnose and dissect it as if it were some paltry bagatelle well within the comprehension of the meanest capacity. The morning journal referred to is one of many whose recurring photographic blunders make one ask if their general news and politics are of the same cast in point of strict value, and whether the miserable public gets a fair exchange for its matutinal bronze. In the name of the myriad photographers of the community, one protests against the mendacious character of the photographic wisdom that is deposited at our doors with the breakfast milk, and ventures the hope that the time may be at hand when the occupants of these "pulpits," as Thomas Carlyle once called them, will know what they are writing about, or if they don't, will find out; and if it is really necessary for them to preach from a photographic text to the non-photographic public—which some of us take leave to doubt—that they will do so intelligibly, if even they are unable to do so accurately.

MANSTON MOORE.

THE PRESERVATION OF SILVERED PAPER.

In or about the year 1875 I commenced a systematic investigation into that discolouration of silvered paper which results from "keeping." This research, however, was rudely broken off, and the greater portion of my notes, like those on *Phosphorescence and Photography*, have "vanished" in my protracted absence from my "home."

One roll of manuscript, however, has turned up as mysteriously as it disappeared. This I will transcribe, and if my transcription is approved of, it will in due time appear in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY, and be "lost" no more. There is one great advantage to an experimentalist who adds "globe trotting" to his other avocations, in the publication of his results in such a periodical as THE BRITISH JOURNAL OF PHOTOGRAPHY, and it is this, that he need carry with him only a list of the titles of his articles and the dates of their appearance to enable him to reperuse them in any of the great capitals of the world, if he should happen to have the *entrée* to the libraries of the learned societies which are there located, and this is easily procured by any one who has obtained the fellowship of any of the learned societies here at home.

In my investigation of 1875, I commenced by extracting (from THE BRITISH JOURNAL OF PHOTOGRAPHY) paragraphs relating what others had done in connexion with the matter I have now in hand, and then I proceeded to experiment.

Here are a number of these extracts:—

No. 1.—In THE BRITISH JOURNAL OF PHOTOGRAPHY of July 5, 1867, page 314, Mr. H. J. Newton's paper read before the Photographic Section of the American Institute is given. He says, "Paper sensitised on a strong bath will discolour much quicker than if sensitised on a weak one." *Inference* (the inferences are my own): If true, free argentic nitrate has something to do with the "spontaneous" discolouration which increases with its quantity.

No. 2.—In THE BRITISH JOURNAL OF PHOTOGRAPHY, July 19, 1867, page 344, Mr. Haydon says, "In preparing my paper I have found much of it spoiled by the weather, but by adding a small piece of sugar to each ounce of nitrate solution I could keep it for many days, and however yellow it might have become it will finish up a pure white." *Remarks*: Mr. Haydon gives no evidence that the "weather" spoiled his paper. He wrote in July. The weather probably was hot, and very likely "dry." The addition of sugar would prevent the paper from completely drying. *Inference*: That silvered paper goes "yellow" more readily when dry than damp.

No. 3.—In THE BRITISH JOURNAL OF PHOTOGRAPHY, September 6, 1867, page 429, "J. C." says, "Thoroughly dry sensitised paper rolled up and closely corked in a wide-mouthed bottle may be kept six weeks." The Editor adds, "To keep excited paper it is necessary that it be exposed to neither light nor moisture." *Inference*: That moisture is conducive to "spontaneous discolouration," an inference directly in contradiction to that arrived at from the statements in extract No. 2.

No. 4.—In THE BRITISH JOURNAL OF PHOTOGRAPHY, 1868, page 221, Mr. Bovey says, "Sugar does not prevent the paper turning yellow, but the yellowness is entirely swept away by fixing." *Remark*: This is corroborative of extract No. 2. *Inference*: That in spite of the non-dryness of the paper, sugar does somehow prevent that discolouration which is insoluble in hypo.

No. 5.—In THE BRITISH JOURNAL OF PHOTOGRAPHY, October 29, 1869, the Editor says he "has received a sample of paper prepared by Mr. Henderson, who claims that it will keep indefinitely. The mode of preparation is not given, but it is hinted that the paper undergoes some treatment before silvering, and it is affirmed that in this treatment a salt of tin is used, and, it is alleged, gold also." I fail to deduce any inference from this statement, and have no remarks to make.

No. 6.—Mr. Henderson, in THE BRITISH JOURNAL OF PHOTOGRAPHY, 1869, page 511, says that "putting silvered paper under the receiver of an air-pump and exhausting the air does not prevent discolouration." *Remarks*: I should not think it would. The discolouration (irremovable by hypo) is probably owing to reduction, and I know of no reducing properties in atmospheric air pure and simple.

No. 7.—Mr. Bovey, in THE BRITISH JOURNAL OF PHOTOGRAPHY, 1869, page 591, says, "One of the chief advantages I find in the use of nitrate of soda, is an entire absence of that discolouration which always accompanies the use of nitrate of silver without any adjunct." *Remarks*: Possibly the nitrate of soda is reduced by the presumably existing reducing agent in the paper. But as soda is a more powerful base than silver, why is not the silver salt reduced as well? Is it not reduced? If I remember rightly, when nitrate of soda was introduced weaker silver solutions were employed. Is not the result

obtained in consequence of the weakening of the silver? and is not the inference the same as deduced from extract No. 1? Is it a fact that there is "an entire absence of discolouration?" What is an "entire absence of discolouration?" How long will the paper enjoy that absence? I fail to draw an inference.

No. 8.—Mr. Badai, in THE BRITISH JOURNAL OF PHOTOGRAPHY, 1870, pages 29 and 30, says, "Washed paper preserves its whiteness and sensitiveness perfectly for eight weeks after it has been sensitised, and prints thereon may be toned in three or four days, or *weeks* if need be." *Inference*: Substantially the same as that deduced from extract No. 1—viz., the free argentic nitrate has something to do with the "spontaneous" discolouration, which *diminishes* with its quantity.

No. 9.—In THE BRITISH JOURNAL OF PHOTOGRAPHY, 1870, page 162, Mr. Antony says, "I have ascertained by careful experiments that the turning brown of albumen paper in hot weather is produced by the penetration of the silver solution through the albumen and into the paper upon which it is spread, the action of the nitrate in a concentrated form causing the brown colour. I have found that merely blotting off the excess of the silver solution has a very material effect in arresting this tendency to turn brown, and it is but reasonable to conclude that washing would be much more effectual." *Remarks*: To my thinking there is more sense in Mr. Antony's observations than in almost any of the others I have quoted. He attributes the reduction of the silver to the paper and not to the albumen. But as he is of opinion that washing would be "much more effectual" than blotting, one is tempted to wonder why he did not try it in the course of those "careful experiments" by means of which he "ascertained" that the turning brown of silvered paper was owing to the penetration of the nitrate "through the albumen and into the paper on which it is spread." *Inference*: That in silvering the paper should not be left upon the nitrate bath long enough for the penetration of the albumen, and that after silvering the paper should be washed.

No. 10.—Colonel Wortley, in THE BRITISH JOURNAL OF PHOTOGRAPHY, 1870, page 337, says he uses washed paper fumed (with ammonia?) for his printing operations. He gives a list of its advantages, but does not mention "keeping" as of their number.

No. 11.—"H. T. A." (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1870, page 453) says, "Paper sensitised on a solution of silver nitrate containing alum keeps its whiteness in hot weather better than when the simple nitrate only has been used." *Inference*: That hot (and presumably dry) weather is conducive to discolouration, and that alum is an agent which retards it. *Remarks*: Alum seems a curious substance to use in conjunction with argentic nitrate. It would probably oxidise some of the "organic matter" of the paper, and if discolouration is thereby retarded, the inference would be that the organic matter of the paper is a reducing agent, and, *as such*, "develops" the "spontaneous" discolouration. In this event very likely any other oxidising agent mixable with argentic nitrate would have the same effect, and I apprehend that the proper time to use this oxidising agent would be when the paper was in course of manufacture, or, at any rate, before the time of silvering.

No. 12.—Mr. Webster (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1870, page 518) says, "Washed paper unfumed will not print in a satisfactory manner, but will if fumed (with ammonia?), and will keep quite white for several days, and at the end of a week be in better printing condition than paper twelve hours old prepared on a summer's day in the usual manner." *Remarks*: The ammonia fumes (I am assuming that ammonia is the "fuming" agent) would, I apprehend, convert a small quantity of the argentic chloride into "argentic ammonia chloride," a soluble, and, if I remember rightly, an explosive salt (I am writing where I have access to no books whatever). My own experience has been the same as Mr. Webster's. I have found when the nitrate has been washed out the prints have had the appearance of being partially washed out too, and that ammonia fuming has rectified all this. *Inference*: That argentic chloride does not print well excepting in the presence of a soluble salt of silver. Why not? I have a hazy remembrance of some photometrical process in which silver chloride was precipitated in a tube with an excess of water in it, and that chlorine gas was evolved by day and reabsorbed by night. Is the unsatisfactory nature of prints obtained on paper washed but unfumed caused by the action

of "nascent" chlorine on the metal which has been reduced, and is it that the function of the soluble silver salt is to absorb the chlorine?

D. WINSTANLEY.

(To be continued.)

COLOURING AS APPLIED TO PHOTOGRAPHY.*

A FEW remarks may not be altogether useless regarding the principal (of the many) materials we may have to work upon. They sometimes demand a special treatment which, although differing one from the other in many points, will nevertheless be conformable to the rules laid down. There will never be excellence in a picture where water colours are used, if *brains* and *judgment* be not employed as often and plentifully as the *water*. I may repeat it, hard-and-fast rules for the treatment of pictures cannot be framed. The principles and the different methods can be laid down for the beginner's study, but without a lavish use of his own brains he can never turn them to advantage.

Carbons upon opal are in very general favour, and can be made very handsome pictures. There are many points which give this class of picture a distinct advantage. The least among them is certainly not the beauty, delicacy, and purity of the high lights. On this material the eraser will produce the most delicate lights, while at the same time they are clear and effective. If desired to be made still more prominent than the eraser may have made them, the effect can be heightened by the judicious and careful addition of a little Chinese white.

To begin work on an opal, I would recommend rubbing down with an eraser or the use of pumice-stone (very finely powdered) as a first step. Of course judgment must be used when *rubbing down* to only do so where it is necessary. To touch the shadows which are a proper depth would only be to entail very considerable work, and this would naturally be a very great disadvantage when we consider the prices at which we may be obliged to turn out the work. I have had some experience in this regard, and can therefore speak feelingly as well as give good advice. After so doing we may have a very good surface for working upon, but if not, a wash of a sizing preparation passed over the entire picture will secure it. It will also somewhat help the brilliancy of the shadows as well as give a favourable surface for working upon. We then proceed as already laid down. There is little else to be said as to the treatment of carbon pictures on opal base, save, perhaps, that it is not advisable to use more *gum* than is absolutely necessary, as the same has, if used in quantity, a very great tendency to crack and chip off. Such a calamity as this would necessarily ruin your picture.

We have also collodion pictures upon opal which may require our artistic services to make look at their best. These pictures, when varnished with a water varnish, will present a surface admirably adapted for working upon. There is no material upon which you depend so thoroughly as upon *washes* for your effects. This is a great boon to the artist. Any surface upon which you can safely employ washes for gaining your effects will also enable you by such a treatment to save much time and labour.

It is impossible to use the scraper upon this surface, as the film will not lend itself to such a treatment, therefore it is of the utmost importance that the print should be a proper depth, not too dark. If we do not pay due attention to this we will have our pictures heavy and anything but pleasant to look at. All high lights which may be necessary will have to be put in with Chinese white. The use of gun water, except where extra force is required in the finishing touches, is not at all necessary, nor its use advisable.

The backgrounds of pictures on opals are for the most part vignettised. Indeed, for every twenty pictures done on opal at least eighteen are vignettes. When, however, there is a picture with the background fully printed in, we must treat it just as we would an ordinary picture. In the case of vignettes, many artists depart from the ordinary lines, and rub in their backgrounds with chalk; and I have known some very pretty results to have been obtained in this manner. If we should elect to use this method, we must take a little soft crayon or stumping chalk on the end of our finger, and rub it in with a circular motion, and, of course, doing our best to obtain extreme softness at the outer edges. In backgrounds of this kind our

* Continued from page 742.

efforts are directed to making them appear as nearly as possible like clouds. If it should appear that a light or two (as it were on the edge of a cloud) would be an improvement, we can easily enough secure them. We have only to pick them out with a bit of bread or indiarubber, just as we would in an ordinary crayon drawing.

Plain paper prints, although not often used since the introduction of carbon, which has the very great advantage of being permanent, may sometimes turn up requiring our services. I remember the time when I did a great deal of black-and-white work (so called) upon the plain paper prints, but of late years have very seldom met them. There is not the same facilities for working upon them as upon the carbon tissue. The shadows, for example, if too heavy, must remain so. Therefore we should always have a really good print to work upon. Of course these remarks apply to the use of *photographic* paper only.

There are two kinds of the old-fashioned paper prints—those printed on albumenised paper and those printed upon salted paper. The former gave bright prints, and all we could do was to even them up when they were coarse, and in the cases of enlargements and copies help the drawing as much as we could. This gave us but a limited chance of making a good picture in many cases, as we were powerless, when the print was heavy and black, to lighten the shadows, and in other ways make it more likely to please and give general satisfaction.

Photographs on salted paper were at one time frequently used for water-colour painting, because it afforded such a favourable tooth to the artist to work upon. They were also largely used as a basis for black and coloured crayon work. It is also a good basis for water colour. Washes may be freely used without any danger of disturbing each other. This is more than can be said for its albumenised companion, upon whose surface, if you get *one* wash successfully, you are lucky, for the rest must be got by stippling, &c. Should the surfaces at any time become rough from any cause whatever, the necessary smoothness can be again attained by the use of what is called a burnisher. These burnishers are made generally of *agate*, and in a great variety of shapes, but I consider the curved one by far the most useful. In order to regain the original smoothness of surface, place a piece of tissue paper over the portion which has become rough, and then with a moderate pressure and circular motion rub the burnisher over it until a sufficient degree of smoothness is obtained.

Photographs printed by the platinotype process will also come under our hand from time to time. These are most delicate and beautiful pictures. They are mostly black in colour, and of course must be worked in a like colour for monochrome. The surface of these beautiful pictures is exceedingly well adapted for the application of colour in any form; indeed, it will take colour as well as any paper generally used for colouring. If not sized it will be found rather absorbent. A print about being worked upon if not sized should be rather well rolled, in order to produce a kind of surface which would be closer and less absorbent than if left in its natural condition. As much rolling tends to lessen and dull the lights, I think it best to give the print a complete wash of some sizing preparation, such as I have before recommended. The shadows may be deepened by the application of gum water, and the lights will be equally benefited by being picked out with Chinese white. The knife and eraser are not much used on these pictures.

Photographs on ivory are generally done in carbon, and the treatment will be the same as on the ordinary carbon prints, whether on opal or paper. It is very seldom that ivories are finished in monochrome, but whenever they should be ordered in that style treat them as though they were opals.

Gelatino-bromide paper is another basis upon which photographs may be produced, and one which lends itself to all the various methods of finishing. It is alike suitable for crayon, water colour, or oils. For working up in crayons there is no necessity for any special preparation, as the plain surface is well adapted to the work. I will not enter into the method of working it up in crayons, but restrict myself to the application of colour.

Before beginning work it will be found necessary to prepare the surface for the reception of the colour. This is done by passing a solution of *alum* over the picture, which happily has the effect of hardening the gelatine to such an extent that almost anything can be done on a surface so prepared. Without this preparation the surface would be

too receptive. Without this preparation it would be impossible to pass a successful wash of colour over the photograph, as each touch would be absolutely held as it were, and all attempts to blend or soften it would only result in pulling up the print from the surface of the paper. After the preparation you can wash in or wash out, and even take out lights as you would on Whatman's paper, by the application of water and rubbing off with a cloth. The alum solution is passed carefully over the print, which is left to dry and is then ready to start working upon.

Some very excellent effects can be gained in putting in the backgrounds of vignettéd pictures by the use of pastel (the half-hard kind), with just enough powdered pumice-stone mixed in it as will give it a gritty feel. This rubbed in with the finger or a stump, as before described, giving a most effective and pleasant result. It will be found advantageous to master the treatment of the gelatino-bromide paper, as it will become very popular. In fact the demand for it increases more and more every day. It is not often one finds a basis so well adapted for *all* kinds of treatment as this paper. It takes crayons like drawing paper, water colour (after alum solution) like a sheet of Whatman's, and oils, after being sized, like an ordinary canvas.

I think the foregoing will be sufficient as regards monochrome as applied to all the principal materials upon which photography is offered to the public. Having mastered these, we will be free to attack the working up in *natural colours*. It must, however, be carefully remembered that all the remarks and principles laid down for monochrome have a distinct bearing upon the whole treatment of photographic painting.

REDMOND BARRETT.

(To be continued.)

MYSTERY GOLD.

In these days, when many photographers prepare their own chloride of gold, and some without the success reasonably expected, the following letter by Mr. Edward Bressey, in the current issue of the *Pawnbrokers' Gazette*, will be useful to all who take an interest in the gold question. He says:—

"Some months since a fether-link albert marked 15 carat turned out of pledge here. It was sent to the auction rooms, some dealer called it 'mystery,' it did not sell. I assayed the albert and found it contained 6½ carats of gold; I likewise broke it up for old gold, reserving a few links for analysis, feeling sure there was something peculiar about the alloy, as it appeared to me by the ordinary tests much above 6 carat gold (it was pledged for 2*l.* per ounce).

"I have recently analysed a portion and find it is composed of gold, silver, copper, aluminium, and iron. The aluminium, though present in small proportion, helps to make the alloy stand the action of nitric acid much better than one might suppose; the alloy is very malleable, I have passed some links through the flattening mill until they are as thin as note paper. Aluminium is a hard, white metal, not so white as silver, and not so blue as zinc. It resists cold nitric acid almost to the same extent as gold or platinum, but dissolves slowly in boiling nitric acid. I have paid from 5*s.* to 8*s.* per ounce for aluminium, but never obtained it pure, it is always contaminated with iron.

"I may here remark that when reporting the presence of iron in an alloy such as the above, or the bright gold brooch in my letter of last week, I do not suggest for one moment that iron is necessary or a desirable element in the mixture, but quite the contrary, it is present as an impurity in ordinary zinc and copper. Pure zinc, free from iron and arsenic, costs 6*s.* per pound, ordinary zinc, I suppose, costs about 3*d.* per pound. With regard to the cost, value, &c., of parting assays, I should be glad to say a few words.

"Parting assays cost 1*s.* 6*d.* The quantity of precious metals contained in the alloy is quoted in ounces, &c., of F.G. and F.S. in 12 ounces troy.

"To convert the quotation into carats of gold multiply the weight of F.G. by 2, and for ounces read carats, and for pennyweight read twentieth part of carat; example—2 ounces 15 pennyweights F.G. in pound troy multiplied by two equals 5 ounces 10 pennyweights, or 5 carats and 10 twentieths, or 5½ carats.

"To find the value take the F.G. at 84*s.* per ounce, the F.S. at 3*s.* 6*d.* (about), divide the total by 12, the product is the value per ounce, example:—

	oz.	dwt.	£	s.	d.
F.G.	2	15.0	11	11	0
F.S.	3	18.0	13	8	

Total. .£12 4 8

"Divide by 12—value, *l.* 0*s.* 4*d.* per ounce.

"Gold assays cost *1*s.** and usually quote number of carats worse than 22. Thus—*W*^o 19 dwts. equals 3 carat gold. Each carat of gold contained in an alloy may be reckoned at 3*s.* 6*d.* per carat per ounce, thus—9 carat gold is worth *l.* 1*s.* 6*d.* per ounce (of course I am speaking of bars of gold sold by assay).

"I need hardly point out parting assays are the proper ones to sell by the example above, 5½ carats would come out at 19*s.* 3*d.* per ounce for gold, but by reckoning the silver the value is *l.* 0*s.* 4*d.*

"I am not sure that I should have troubled you at such length, but I have seen jewellery factors cover a good size paper with figures to convert the quotation of ounce, &c., in pound troy to carats, that I think the above simple method may be useful to some of your readers.

"EDWARD BRÉSSÉY."

WHAT TO PHOTOGRAPH.

ALMOST everything animate and inanimate has been subjected to the ordeal of being photographed some time or another. Still, it is no uncommon thing to find some difficulty in getting suitable subjects to practice upon. Good pictures and indifferent ones—the latter predominating—are continually being made, and, we may add, a vast aggregation of irredeemably bad ones into the bargain. The difficulty is with those who estimate a photograph principally by its artistic qualities to find sufficient variety. The places and subjects they have tried and found yield satisfactory results lose interest, and the desire for something fresh is not to be satisfied by going over old ground. Here, then, is a striking difference between painting and photography. The same neighbourhood will afford generations of painters ample material for their canvases; variations of light, of colour, and of treatment make so many distinctly new combinations. A most unprepossessing subject to the photographer may be a mine of wealth to the painter. This, however, is perhaps an exaggerated fancy, and the mystery may be possibly referred to a deficiency of artistic perception in the photographer, for it is scarcely probable that any one who has not received a proper artistic training is likely to see the beautiful and picturesque in anything like the same degree with those who have. It stands, therefore, to reason, that not being educated to see, one fails to find those subjects which when rendered in monochrome will afford artistic satisfaction. We all know the refreshing experience of photographing a well-known and possibly uninteresting scene if covered with snow; a new face is put upon it, so to say, and if it were not for the discomfort of working under Arctic conditions we should probably have many more beautiful examples of snow scenery than we have. Snow is, however, an uncertain and unexpected visitor from a photographic point of view—here one hour and gone the next, so far as its pristine sparkle is concerned—and fortunate is the photographer who is fully prepared and in the right neighbourhood at the right time. Trees offer many inducements to the picture maker both in full leaf and when entirely denuded of foliage—beautiful results may be obtained from either; the same view with and without foliage is sufficiently different to merit reordering in both conditions.

I think if the illumination of the landscape was made more of a study good would come of it. There might be many new pictures obtained from old familiar places that would be pleasant surprises. Suppose we have found a subject that has given a satisfactory result in the morning; we think that is the best time of day and any other lighting would give an inferior picture. It is well worth while to try it with an opposite effect, not only of lighting but of atmospheric conditions, and very likely the photograph will not only be good, but so entirely different from our first choice that practically it is a different picture. A front light very often supplies beautiful effects, if not the most beautiful; the only precaution is to manage so that the sun does not shine on to the lens by selecting a station point protected by the shadow of some object in front—a tree, building, or what not. The altered appearance of the subject, by nothing more than change of direction of light, is something marvellous, and is worth a most critical examination. A few experiments will convince the most sceptical. Objects that were invisible under one aspect will assume importance under another. Strong, deep shadows will be substituted for gleams of light; in fact, the composition is so altered as to be scarcely recognisable.

In examining a number of photographs taken by various men of the same place, although all may possess equal technical excellence, some will at once arrest attention and others hardly get a second look; and why? Nine times out of ten it will be found the lighting is more effective and the treatment more artistic in one case than the other, or the level uniformity of a foreground is broken up by a shadow or puddle reflecting some bright light that is absent in the rest, or some difference equally trifling in itself, but so important in its effect,

showing that the man who made the picture was fully alive to the value of trifles, which may, perhaps, be light as air or insubstantial as a dream, yet in the photograph are magnified into considerable importance, so much so that it is a reasonable assertion to say that the pictorial value of a photograph depends entirely on trifles. Let any one look over his stock of photographs and see how many he can find that some trifling addition or alteration would not vastly improve. If this or the other was just a *little* different from what it is how much better would the picture be. Another thing, a photograph challenges attention and criticism as much, or more than, any other pictorial effort. The representation of texture, detail, and drawing are, so to speak, effected automatically, with little or no trouble or experience, and in a good photograph are beyond criticism, so that the proper choice of light and arrangement, which qualities are under the control or rather dependent on the judgment of the operator, should receive his most careful attention. If he fails in these respects, it is either owing to his want of care or lack of knowledge, and merits the adverse criticism that will no doubt be awarded.

In the search for subjects to photograph, those presenting strong contrasts are usually the most effective—a bright light in juxtaposition to a deep shadow, such as a *good* moonlight effect for instance, where deep shadow is not represented by unmeaning blackness, or the lights hard and chalky, but where the darkness is full of subtle differences of degree, and the lights with pearly half tones, contrast alone being responsible for brilliancy. Such pictures owe much of their charm to the quality of suggestiveness, the unseen something that excites interest. If we examine a picture of this kind the eye naturally tries to penetrate the obscurity and discover as much as possible of the landscape, the effort creating much more interest than if the whole of the picture was clear and easily discernible at first sight. This quality applies to any other picture. Something left indistinct and indefinite gives value to the parts that are clear and well defined, thus enhancing the importance of both. A slight haze is in most pictures a valuable adjunct to the pictorial effect. In other words it gives the mind a little exercise, for whilst the eyes are occupied in discerning the form, the imagination is busy filling up the gaps that lie hidden or partially obscured. This power of appreciation depends of course on the idiosyncrasy of the observer, and exists in all gradations from an absolute blank to the ultra-refinement that appreciates the slightest variation of a tone or position of an object. The pleasure experienced in the effort of satisfying oneself that one has thoroughly understood the artist has a fascination for some that differently constituted minds can never appreciate—theirs is the loss. The quality of suggestiveness, valuable as it is, is often burlesqued by the substitution of fuzziness; it can be scarcely called going to extremes, for the point of the matter is entirely missed, and instead of something upon which we can pleasantly dwell, we are offered unmeaning blankness, an indistinctness without a purpose. The line between the two is somewhat difficult to define at all times, and is very much dependent on artistic feeling both of artist and observer.

EDWARD DUNMORE.

(To be continued.)

FERROUS MURIATE AND ITS USE IN CONNEXION WITH THE OXALATE DEVELOPER.

FEW workers in gelatino-bromide, whether in the case of plates or paper, are aware of the numerous changes that may be rung on the good old-fashioned and well-known oxalate developer. The combination of a solution of oxalate of potassium with protosulphate of iron, in proportions suited to the various formulæ that have from time to time been given to the public through the medium of the journals and reports of societies, is perhaps in a large measure the only one generally known and used. Let it be remembered that oxalate of potassium in combination with any soluble salt of iron forms oxalate of iron, the acids which form the compounds of iron producing various effects according as they are used. In this category we may mention, among others, tartrate of iron, lactate of iron, and muriate of iron, or properly speaking ferrous muriate. While each has characteristics peculiarly its own, which are shown in development, the one which has to my mind seemed to possess qualities of the greatest importance to photography is the last named. Ferrous muriate may be bought of the wholesale druggist at a comparatively low figure, but for experimental purposes a paper of fine tacks and a couple of ounces of muriatic acid mixed at night, well stirred, and left till next day, will be found to be pretty nearly saturated with the iron from the tacks; iron filings would perhaps do better and dissolve somewhat more rapidly. The appearance of the liquid after filtration will be a more brilliant green than that of a solution of sulphate of iron, and

should be tested for acidity. If found to be but slightly acid it is in good condition to be used, and combined in the proportion of one of the iron to three of the saturated solution of oxalate of potassium, will be found to give a developer of extremely powerful character. In some experiments which I have tried this fact has been demonstrated to me very forcibly, and I have been agreeably surprised to find that the ferrous muriate in combination with the oxalate of potassium is a more active reagent than the ordinary form of developer; in fact, I think I may assert the difference in its favour to be almost one-third.

This, I am confident, will be a matter of importance to those who make a specialty of instantaneous work, a small quantity of the ferrous muriate solution being kept for use in special cases of extremely short exposures. I hope that these suggestions will be followed out by those who have more time at their disposal than I can at present afford, to bring out the possibilities that exist in this rather novel form of development.

DAVID COOPER.

—*Anthony's Bulletin.*

THE TESTING OF LENSES.

[A Communication to the Camera Club.]

WE may test photographic lenses in two ways:—First, we may test a lens as to its freedom from faults; and, secondly, we may test a lens not so much to find out whether it is only faulty, but, by focussing the lens on certain definite ruled scales of known size and form, give a definite numerical value for the performance of the lens as regards each quality. Now there is a great difference between these two methods. The first, which is the sole method employed by all lens manufacturers, does not enable them to state how good a lens is—it merely enables them to say, This lens is truly, or untruly, centred. In other words, it simply tells the optician where the fault lies, and whether a lens will perform well or only passably. Now, by the second method, we are enabled to register its performance, and, to use a homely illustration, to award a certain number of marks for each quality, and so to compare each lens in terms of the performance of other lenses, and that for each property it possesses. The first is, so to speak, a qualitative analysis, the second a quantitative one. The first requires special apparatus, and a training which needs years of practice to perfect oneself in, while the second requires only a camera and such apparatus as may be manufactured at home. It is this latter which I intend chiefly to occupy your attention with to-night; but, before doing so, I will allude as briefly as possible to the first, that is, the optician's method of testing lenses. Now, the first thing a workman does is to see that all the lenses are mounted truly, so that all their optical centres are in a straight line. This can be done by chucking the lens carefully on the lathe, and holding a small gas flame in such a position that the whole row of reflected images can be seen in a line with the optical axis of the lenses. The lens is now revolved in the lathe, and the images watched; if they all remain immovable the combinations are all truly centred; if the images wobble, one or other is out of truth. By reversing these in their flanges, it is easy to see which is at fault. After this is done the workman turns the lens in its cell with his finger and thumb, to be sure that it turns freely, so that the contraction and expansion of the amount may not displace the lenses. Before doing this, it will be necessary to see whether the surfaces of the lens are true curves; whether the balsam between the contiguous surfaces is an even homogeneous layer; and, lastly, the curves being right, whether the spherical and chromatic aberration are balanced by the crown and flint lenses. All these tests can be made together and in this way. The lens is screwed on to the camera in the usual way, and a highly-polished silvered or steel ball is placed in the focus of the lens. A beam of light is now thrown on to the bulb from a bright source. The ground-glass is now shifted until the image is perfectly sharp in its centre. The former is now removed, and a Ramsden eye-piece is screwed on a movable arm, and the image is examined in air through it. By the appearance of the image, makers judge of the correction of the lens, whether it is sufficiently corrected for spherical and chromatic aberration, flatness of field, depth of focus, or astigmatism. These are the chief tests used by opticians, and they are of the greatest value; but I will, with your permission, give you my own scheme for testing lenses quantitatively.

Before testing the lens we must first ascertain two points:—(1), The equivalent focal length of the lens; and, (2), its working aperture.

To find the former there are many ways. If a single lens, the best way is undoubtedly to focus on an extremely distant object, such as the moon, or a distant weathercock, and then lift up the ground-glass of the camera and insert a rule; let its end touch the back surface of the lens and then mark where it touches another rule placed across the camera, on a level with the position of the inside of the ground-glass. Next unscrew the lens from its flange, measure its thickness in the middle line, and add half this thickness to the length obtained;

the sum will give the actual focal length of the lens within a very minute fraction, far beyond what is necessary in practice. If we want to find the focal length of a symmetrical or compound set of lenses I think the best way is to take the focal length of each combination separately by the above method, and then to measure accurately the distance between the optical centres of the two combinations, then by the well-known formula:—

$$\frac{1}{F} = \frac{1}{f} + \frac{1}{f_1} - \frac{a}{ff_1}$$

$$\frac{1}{F} = \frac{f+f_1-a}{ff_1}$$

$$\therefore F = \frac{ff_1}{f+f_1-a}$$

the result is obtained.

Thus if focus of one lens $f=6$ inches and focus of second lens $f_1=8$

$$\text{Then } F = \frac{6 \times 8}{6+8-2} = \frac{48}{12} = 4$$

There are several other methods, but, with one exception, all are laborious and require an optical bench or special apparatus. This exception is by taking a lens whose focal length is known absolutely, and comparing the size of its image with the size of the image thrown by the lens to be tested. Then the focal lengths are directly as the linear dimensions of the images. If the two combinations are of equal focus and symmetrical, the optical centre is obviously midway between them. If not, the position of the optical centre can be at once found by measuring the ascertained focal length from the ground glass to the lens mounts, and there marking it off.

For those gentlemen who wish to arrive at very exact results I recommend them to Glazebrook & Shaw's *Practical Physics*. In comparing lenses it is absolutely necessary to compare them with similar working apertures proportional to their focal length. For the portrait I take $\frac{1}{4}$ rapid doublet, $\frac{1}{4}$ wide-angle triplet, and landscape $\frac{1}{6}$ as the standard. If the stops do not correspond to these apertures I make fresh ones out of cardboard. In the case of compound lenses I check their sizes by Dallmeyer's plan of placing a card with a small hole in the place of the focussing glass, and measuring the image of a candle placed behind the hole as it appears in the front lens of the combination.

I have had a large camera specially constructed for testing lens. When actually testing I remove the focussing glass and substitute my movable magnifier. This consists of two bars of magnetised iron, one on either side of the frame, on the outside of which is a scale divided into millimètres all the way along. Another bar of steel, also divided into millimètres, whose ends rest on these bars, can slide up and down, but is prevented from moving sideways by brass stays. On this a holder slides along bearing a Ramsden's eye-piece, with which I focus, and by the position of the ordinates and abscissae of the two scales I can find instantly any position on my aerial focussing field. Having placed my ruled trial screen, on which a series of concentric circles are ruled each two mm. in width, and the spaces also two mm. in width, I proceed to move my camera until a given number of lines can be counted to the inch or centimètre, and then I proceed to test my lens.

In this method the figure, consisting of concentric circles, is placed in the centre of the focus of view of a camera, the number of inches or centimètres, within which the outlines of the circles can be distinctly defined, being taken as a measure for the defining power of the lens. In comparing difficult lenses, these lines should be reduced.

DR. G. LINDSAY JOHNSON.

(To be continued.)

THE LATE MR. J. B. DANCER.

WE have referred to Mr. Dancer's death on a previous page. For some time Mr. Dancer had been in very delicate health, and to this suffering was added the terrible affliction of total blindness. Mr. Dancer was born in London on October 8, 1812. In 1818 his father, Mr. Josiah Dancer, removed to Liverpool, where he carried on the business of optician and philosophical instrument maker; he was also a public lecturer on science, and was an active promoter of the Mechanics' Institute and Literary and Philosophical Institution of Liverpool. The foundation of Mr. Dancer's optical knowledge was laid in his father's workshop. He also assisted his father in his lectures, and very early in life evidenced a strong bias for mechanical and scientific pursuits. In 1835 the father died, and the business was afterwards carried on by the son.

After a few years Mr. Dancer removed to Manchester, where we find him in 1842 elected a member of the Literary and Philosophical Society, his diploma being signed by Dr. Dalton. In 1845 he became a Fellow of the Royal Astronomical Society. In the successful exhibitions which were held many years ago at the Mechanics' Institution, both in Cooper-street and (after its removal) in David-street, Mr. Dancer took a very important part. It was he who suggested the application of photography to the magic lantern, and who, by the use of limelight, made such application possible. The exhibition of photography on so colossal a scale took the world by surprise, and this grand application of a marvellous art, which has now become so familiar to us, was received with the admiration it deserved. Mr. Dancer's services to the lantern did not end with the application of photography to it; he also improved the arrangement of the optical parts, producing a clearer image and a flatter field than had before been obtainable.

In 1839 he introduced photography to Liverpool, working Daguerre's process, and in 1841 he was the first to do the same for Manchester, which had not yet seen a photographic camera. In the same year he commenced microscope photography on Daguerreotype plates, and this wonderful art he perfected in 1852, when the introduction of the collodion process much simplified this and every other photographic process. These tiny examples of photography excited the warmest admiration and commendation of Sir David Brewster and other distinguished men. Mr. Dancer's diffidence prevented him from claiming for himself in this, as in other discoveries, the acknowledgment that was his due. The invention of micro-photographs was claimed elsewhere, but after a full inquiry by Mr. Joseph Sidebotham, Mr. Edward W. Binney, and the Manchester Photographic Society, Mr. Dancer's claim was allowed. In his record Mr. Sidebotham wrote in 1859: "Mr. Dancer's modesty will not allow him to speak of his own discoveries, but I am sure you all join in the annoyance I have felt in seeing persons coolly claim as their *own new discoveries* what our respected townsman has accomplished so many years ago." In 1853 Mr. Dancer invented the twin-lens stereoscopic camera; that is, a camera with two lenses, placed side by side, at a short distance apart. Before Mr. Dancer took the matter in hand photographers had disagreed as to the distance the camera should be moved for the second picture. In order to give in the stereoscope the proper relief effect some advocated eight inches distance, and some so much as twenty-four. Mr. Dancer was convinced that the proper separation was the ordinary distance between the eyes of a human being, and made his camera under this idea: for the purpose no other camera is used now. Writing in April last to a friend, Mr. Dancer says on the subject of stereoscopic photography: "Whoever undertakes the photographing of the articles collected in the Jubilee Exhibition, which may possibly not be excelled by any collection for many years to come, will, I sincerely hope, freely use the stereoscopic camera. In my humble opinion, based on thirty years' experience, stereoscopic photography is the only process suitable for photographing the solid objects contained in such exhibitions. There is one advantage connected with it which is very little known, or otherwise stereoscopic photography would never have fallen into such disuse as it has done of late years. The advantage is this: if the lenses used are of the same focus as those used in the stereoscope through which the pictures are viewed, the objects represented appear of the same size as the real objects did to the human eye when viewed from the place where the camera was situated." It is to be regretted that such a series of pictures as Mr. Dancer hoped would be made was not undertaken at the Exhibition.

After recounting numerous inventions and improvements in the realms of science, particularly in microscopy and electricity, the *Manchester Guardian*, to which we are indebted for the foregoing particulars, says:—

"Any scientific man finding himself confronted by a difficulty has gone, all through the last forty years, to Mr. Dancer as to an encyclopædia. Days absorbed in this way had to be made up by nights spent over the microscope, and in the end Mr. Dancer lost his most precious possession—his eyesight—not suddenly, but little by little. His knowledge of his own state even enabled him to make diagrams of the destruction of the retina, and to show the surgeon how it was slowly becoming unserviceable. Blindness to such a man was a terrible infliction indeed. With the failure of his sight business also began to fail, and a few years ago the old shop, known to every Manchester man, had to be shut up. Then a few gentlemen came together, an appeal for subscriptions was issued through the papers, and very quickly a few hundred pounds were raised. From that time the small income that has come from this fund has been Mr. Dancer's only means of living. The story is one of the saddest it has ever been our lot to chronicle.

"His active mind never lost its interest in the studies and discoveries

of his earlier years. By his numerous friends his society was to the last highly appreciated, and his modest and kindly disposition greatly enhanced the pleasure and advantage of his conversation."

THE PHOTOGRAPHIC COMPANY, LIMITED.

WITH a great flourish of trumpets the prospectus is published of the Photographic Company, Limited (proprietors of the Cellier-Parkes Colour Process). Although the Company also takes over the business of a photographer (Mr. Vernon Heath), the chief feature of the new venture is the above-mentioned process of so-called photography in colours, and considering the enormous purchase consideration demanded—42,000*l.* in cash and 25,000*l.* in deferred shares—it would be absurd to suppose that an ordinary photographic business could produce anything but a mere fraction of the income required to earn a dividend on the capital of the new Company of 100,000*l.*

All, therefore, depends on the value of the Cellier-Parkes process, and the investor will do well to ponder whether this invention is such as to promise a lasting income. We have not ourselves been given an opportunity of investigating the merits of the process, although we offered to do so, but our photographic contemporaries have expressed themselves unfavourably on the same, and, as we stated in our issue of 18th June, the *Photographic News* considered this process "to be merely the placing of coloured materials or pigments at the back of a photograph, a thing which has been done so often by Woodbury, Vidal, and others before them. Colouring at the back has hitherto found its most popular expression in the 'Crystoleum' pictures which are still sold in Regent-street and elsewhere." As far as we are aware this opinion has not been contradicted, and speaking, therefore, from the opinions which our photographic contemporaries have been able to form, we should say that the novelty of the process does not appear to be established, while its value is more than doubtful.

There is, moreover, a most formidable rival in the field in the "Mayall process," which approaches much nearer (although it does not, of course, realise) the ideal of photography in natural colours, and is of incalculably greater value than the Cellier-Parkes system. Under these circumstances and unless the Company have some different process than that criticised in our photographic contemporaries, we are afraid that the results must fall greatly short of the results promised by the prospectus. It is very strange that no particulars should be furnished in the prospectus of the patents sold to the Company by the Cellier Syndicate, Limited, but we have taken the trouble to unearth the same from the agreement, and are able to inform our readers that the patents therein stated as purchased by the Company are No. 5052, of 1885, for improvements in the production of pictures with the aid of photography, and No. 14,120, of 1886, for improvements in the production of coloured photographic pictures. As we have received various inquiries from correspondents on this point, we shall fully report on the patents in our next issue. In the meanwhile we have to complain that no copy of the other agreement set out in the prospectus as concluded between the Photographic Company, Limited, and the London Scottish Mercantile Investment Trust and Agency, Limited, was to be seen at the offices of the solicitor of the Company, an omission which is contrary to the Companies' Law. From the information furnished it is impossible to glean what amount has been paid for Mr. Vernon Heath's business and what sum for the patents, and we can conceive no valid reason why these particulars should be withheld.—*Invention.*

[Thus far *Invention.* We are, however, quite at a loss to discover the nature of the "formidable rivalry" hinted at in connexion with the Mayall process, unless Mr. Mayall has discovered some process of colouring photographs other than that which has been so mercilessly annulled upon by the press and by technical photographers ever since its introduction last summer.—*Eds.*]

A NEW GRIMSTON SHUTTER.

WE have been favoured by Messrs. Wratten & Wainwright with an opportunity of examining a new Grimston shutter, which is regulated by a cylinder and piston. The action is altogether unlike any other, inasmuch as the mere raising and lowering of the shutter is effected with the greatest possible rapidity, but there is a regulated delay of action when it reaches the top, the lens being then open. But we allow the specification of patent to speak for itself:—

"This shutter has been designed to obviate a defect common to all time shutters, namely, that when slow exposures are required the opening and closing is as a rule performed slowly also.

"In this new patent the opening and closing are always effected with the full rapidity of the shutter, whilst any slowing that may be required is performed when the shutter is fully open. The slowing is done by the attachment of a dashpot or cylinder to the upper part of the shutter, which comes into action only when the aperture is fully open. The opening and closing are regulated by a cam, and the slowing by a small screw valve on the top of the dashpot. This method of regulating time shutters by an air buffer or dashpot was first applied to the Grimston

shutter in June 1885. In the present patent an improvement has been made whereby the releasing and timing are done by the same dashpot or cylinder. The former arrangement for working in the diaphragm slot has been retained. The shutter is also supplied with the usual pneumatic ball.

"In operation, on pressing the pneumatic ball the shutter opens to the full extent as rapidly as a strong coiled spring can make it; the cam at the moment that the aperture is fully open forces the piston to the top of the cylinder with a rapid movement, giving the required slowing motion, varying in degree according to the regulation of the screw valve, and when the crank has just turned its highest position the cam releases itself entirely from any further action of the air cylinder, and the shutter drops as rapidly as it opened. The whole of the mechanism, which is extremely simple, is enclosed in a small air-tight case, there being no holes for dirt or dust to enter. The exposures can be varied from the most rapid to several seconds."

NOTES FROM ABROAD.

(From our Special Correspondent.)

IV.

THE BAGGAGE OF PHOTOGRAPHIC TOURISTS.

THERE ARE two classes of tourist photographers; the one class is represented by a man who takes with him more baggage than he can lift, or than he can conveniently carry, the other takes no more baggage than he can easily carry himself, far from railways and the busy haunts of men. The latter plan is the best for health or for exploring districts new to him, and involves the necessity of carrying but a quarter-plate camera, or one still smaller, unless he be of considerable muscular development. With knapsack on back, containing his small camera and a few clothes, he is independent of cabs, railways, and porters; he can go ahead over hill and dale, learning the unsophisticated manners and customs of the country, talking with the peasants in their rural homes, or sojourning in the hospices of the monks in mountain fastnesses. On an expedition of this kind he can gain a general idea of the country visited, and decide upon some place as his headquarters when upon a future excursion he can quietly settle down therein for a time armed with heavier apparatus. The late Albert Smith defined the true tourist as the one who roamed in this lightfooted manner, and who carried but two shirts, both of flannel, one of which he would wash himself, if necessary, in a mountain stream, and dry in the sun, weighted down by a stone or two when there is wind.

The travellers who know least about the countries they visit are those who are "put through" by some tourists' agency; they stop at Anglicised hotels abroad, they are attended by servitors who humour their insular customs and prejudices, and who do not forget to charge them at not less than English rates. They travel shut up in an English glass case, metaphorically speaking, and on their return know not so very much more of the real thoughts and social condition of the countries they have visited than if they had been looking at a series of dissolving views in London, and listening to the description thereof by a popular lecturer.

For a tourist who intends to carry all his own baggage, including photographic apparatus, a handbag or small portmanteau is out of the pale of consideration; it would soon become a weariness to the flesh. He has no resource but a knapsack.

A knapsack, however, is rarely sufficiently rigid when it becomes a question of carrying optical apparatus of any delicacy, although some are made of indiarubber over a gridiron-like wicker framework, and others are made of some pasteboard material. Remembering what Mr. England once published about the advantages of a basket for lightness and for carrying anything of a breakable nature, I searched about shops near Covent Garden for a portmanteau-shaped basket, and at last found an exceedingly elegant one of French make. The next step was to discover an actual maker of knapsacks, and one was found in the person of Mr. Price, of Great Marylebone-street, London. He fitted up the basket with two sets of straps, the one set permanently fixed to it, to keep it well closed by straps and buckles; the other, or shoulder set of straps, was removable, and could be detached and stored away inside when in towns. The only fastening to the original portmanteau consisted of two wooden pegs passing through two loops. For these pegs a thin rod of brass with a ring at one end was substituted; through a hole at the other end went a little padlock. Here, then, was an arrangement which served as a portmanteau in towns and as a knapsack beyond their limits; it was light in weight, its contents were under lock and key, and it was so rigid that little fear was entertained of injury to apparatus placed therein, did it get no more than a fair amount of knocking about at railway stations and elsewhere. The knapsack tourist does not want a weight, however light, always tied to his back, and in towns it is often a convenient thing to leave it at the hotel or in a railway cloak-room for a day. Rain was kept from the contents of the basket knapsack by wrapping them in an amply large sheet of mackintosh, which indiarubber fabric, by the way, makes the best of all focussing cloths, it being perfectly impermeable to light and possessing little weight. Once for all, it may be mentioned that in testing this knapsack over long distances it was found to answer every purpose anticipated. Man, by taking thought, cannot add an enbit to his stature, but by taking thought he can wonderfully adapt the knapsack principle to the requirements of the tourist photographer. The straps just where they come over the top and front of the shoulders should

be broad, say, two and a half inches; the knapsack should be carried high up on the shoulders, not down in the small of the back—in the latter place the weight drags, and is more uncomfortable. All Swiss mountaineers and schoolboys carry their knapsacks high up. In two small things if we, in England, imitated the Swiss, comfort would be increased. Few persons in Switzerland wear chimney-pot hats, which are considered an abomination. In some towns they are never seen at all except upon the heads of foreigners, who are gaped at by children as London street boys would stare at a Welshwoman in her Mother Shipton hat. The other thing is, that the Swiss as much as possible abjure handbags and substitute knapsacks for carrying purposes. By combination among individuals these customs should be made more fashionable in this country. Aristocracies care nothing for public opinion, and allow plenty of freedom of thought and action to their own members; the more uncultured the people, the more do they take the liberty of criticising those of their number who depart from commonplace uniformity in dress or anything else; what they deem best for themselves they think best for their neighbours, and exercise uninvited pressure upon their fellows to an extent antagonistic to freedom. The food, dress, education, or religion which is best for one individual is not necessarily the best for another.

English photographers who make but an occasional day's excursion from home with the camera, do not know the wants of the real tourist who means to carry all his baggage for several weeks at a stretch, and who wants its weight kept down as close to, say, eight or ten pounds as possible. Given three ounces unnecessary weight in too heavy mounts of lenses, and five ounces unnecessary weight in too thick paper and covers of guide-books, we have half a pound to be carried uselessly for hundreds of miles, so that the man who does not speak out to manufacturers on these items is an idiot. On critically examining the whole of his baggage, he may be able to see how various manufacturers might together have lightened it by a whole pound. Quite recently, at one of the London photographic societies, two or three of the members thought it to be such a funny thing that anyone should propose to weigh lenses, because conditions in which a few ounces of baggage more or less are of importance had not come within their personal experience.

BELGIUM AS A FIELD FOR THE CAMERA.

Armed for a journey of many hundreds of miles with the light baggage just described, I left London in the middle of September, the best time of year for continuous pedestrian feats, because the great heats of summer have gone, and foliage has but begun to assume its autumn tints. Leaving Liverpool-street by the boat train at eight o'clock, one is on board ship at Harwich by half-past nine; at ten the start is made, and by eleven o'clock the open sea is reached, far from the filthy air of London. The comfortable boats, so late in the tourist season, are not much crowded on the outward journey, the general stream of tourists flowing in the opposite direction. On the following morning, gazing at the porthole of my cabin, I saw as set in a circular frame the weather-beaten countenance of a British sailor, his locks streaming in the wind, forming a good subject for an artist, but the puzzle remained how his face chanced to be there—was he standing upon the briny ocean? Gradually my waking senses realised that I was the sole occupant of a deck cabin, and that he was upon the deck outside. After four or five hours smooth steaming up the Scheldt, the lace-like spires of Antwerp Cathedral are seen over the flat country long before the city is reached, and at ten o'clock the landing is effected. Here a new virtue was discovered in the portmanteau knapsack; the Custom House officers, in passing baggage, put their initials or other hieroglyphics upon it, and trying to make marks upon the blackboard of the Photographic Society is child's play to attempting to write upon such a basket with a piece of soft chalk. The official having failed once, gave up the hopeless attempt with a grin.

It was a Sunday morning, and I found my way straight to Dr. Van Heurck, the Director of the Botanical Gardens, and after a kindly welcome inspected his more recent achievements in photo-micrography, including his latest prints of *Amphipleura pellucida*, which recently have been so much criticised at the Royal Microscopical Society in London. He presented me with an instantaneous photograph of himself and of M. Naquet, son and partner of the celebrated optician of that name in Paris; it was taken by the flashing magnesium light, and is additionally interesting because it includes part of Dr. Van Heurck's laboratory, and some of the microscopes with which so much good work has been done. After leaving him I found a military band enlivening the Place Verte alongside the Cathedral. Then with drum and trumpet, and flying banners, a procession approached. In its centre was a man on horseback, dressed in black velvet, with low velvet cap and a heavy black plume, a broad collar of white lace adorned his neck, and over the high tops of his buff-coloured boots were hanging circlets of white lace. He bore aloft a gorgeous banner, and by his jovial glance appeared to enjoy his position. Here was a subject, indeed, for a photograph. It was the procession in honour of the tercentenary of Joost van den Vondel, the Dutch poet, and I presume that the banner-bearing hero was supposed to represent Van Vondel himself. Had time permitted I should have been glad to have called upon M. Storms, and to have visited some of the officials of the new branch of the Belgian Photographic Association in Antwerp, but the object of the trip was to get the freshest air, and to leave large towns behind as quickly as possible.

That evening I reached Louvain and remained there for the night. In the morning another procession with band and colours came along; a

number of children in dresses of brilliant colours, like the kings and queens of a pack of cards out for a walk. In their hands they carried bunches of flowers—some of the bouquets were gilt all over. One of these fairy queens, aged perhaps twelve, entered the *café* from which I observed the procession, and was treated by the landlady to about a pint of ale, which she swallowed with two or three pulls as if it had been mother's milk. Louvain is noted for brewing the best beer in all Belgium, and perhaps the children are brought up on it. In the centre of the procession was an open carriage containing an old man and woman, who surveyed everything with nonchalance, as if wishing it were all over; opposite them sat two grown up members of their family. All four carried extra-large bouquets fully gilt. Here was an un-English scene for an orthochromatic photographer; but what did it all mean? It was the fiftieth anniversary of the marriage day of the old couple. They were driven, accompanied by martial music, to the ancient City Hall, where probably they went through some time-honoured ceremony in the presence of the Burgomaster. In the vestibule of this Hall are three statues representing the three most highly-prized foundation principles of Belgian liberty, namely, free education, a free press, and freedom of religious opinion. This *Hôtel de Ville* is one of the most elaborate Gothic buildings in the world, the whole of its exterior being carefully carved by the chisel; the artists worked upon a soft stone brought from France and soaked with oil, the whole subsequently hardened. I called at the University, which in the sixteenth century was considered the best in Europe, to see one of the Professors, but it was in the vacation season, and the place was deserted with the exception of the doorkeeper and family. Autumn visits to Belgium are disappointing to strangers, in the circumstance that most of its chief and university libraries are either closed altogether or open only until midday. The people do not seem to have realised the benefit of keeping their best libraries open every evening all the year round.

The chief attraction to the photographer in Belgium is the rich variety of specimens of old Gothic architecture, not alone in churches but in civil buildings. There is infinite variety in the churches, which are frequently vast enough to deserve to rank as cathedrals, and all these eligible subjects for the camera are congregated within short distances. France has magnificent specimens of Gothic architecture, and Rheims Cathedral is perhaps the finest specimen of such, north of the Alps. In France, however, the distances for the tourist are greater. Even little villages in Belgium have magnificent ecclesiastical piles, out of all proportion in grandeur to the density of the surrounding population.

Our Editorial Table.

ELEMENTARY MICROSCOPICAL MANIPULATION.

By T. CHARTERS WHITE, F.R.M.S.

Now that so many are directing their attention to the fascinations of enlarging microscopic subjects by the agency of photography, a manual intended for beginners in microscopy by such an experienced microscopist as Mr. Charters White, comes in at a most seasonable time.

Designed with the aim of instructing the tyro in the preparation of objects of interest and instruction in an elementary yet complete manner, Mr. White's manual takes the neophyte in hand *ab initio*, and describes the nature of the various apparatus required in language the youngest student would find it hard to misunderstand.

The preparation and mounting of both opaque and transparent objects; the cutting of sections; insect anatomy; infusoria and the numerous other things, a knowledge of which go to the making of a microscopist—all come in for as lucid and full treatment as the limits of the work permit; while, as might have been anticipated, a chapter is devoted to photo-micrography.

The manual will prove useful to the class for which it is mainly intended. It is published by Roper & Drowley.

PHOTOGRAPHS OF YACHTS.

By W. H. HYSLOP.

To take from the deck of a steamer in motion direct instantaneous pictures of yachts under full speed in a stiff breeze, on plates 18 x 14 inches, is evidently no easy matter, and the one who achieves this task well is entitled to great credit.

Two photographs of this class before us, not merely photographs but *pictures*, attest the skill attained by the artist, Mr. W. H. Hyslop. They were taken on the Clyde at or about the time of the Photographic Convention of the United Kingdom at Glasgow, when so many crack yachts were disputing themselves in the Clyde. In one we have the *Ariel* and the *Rona* tearing away as if life or fortune depended upon their efforts; in the other we have the *Thistle*. The attitudes, so to speak, are singularly graceful, and their beauty is enhanced by fine cloudy skies. They are printed in platinum with rich warm tones.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 16,018.—“Flexible Films for Photographic and other Purposes, and Apparatus in connexion with the Manufacture thereof.” J. E. THORNTON.—*Dated November 22, 1887.*

No. 16,125.—“Improvements in Photo-engraving or Etching.” Complete specification. E. ALBERT.—*Dated November 23, 1887.*

No. 16,136.—“The Application of Photography to Automatic Sale and Delivery Machines, and the Utilisation of Automatic Sale and Delivery Machinery for the Production, Sale, and Delivery of Photographs.” E. J. BALL.—*Dated November 23, 1887.*

No. 16,241.—“Improvements in Apparatus for Coating Glass or other Surfaces with Fluid or Semi-fluid Substances for Photographic or other Purposes.” F. J. VERRARA.—*Dated November 25, 1887.*

PATENTS COMPLETED.

IMPROVEMENTS IN HOLDERS, CLIPS, OR EASELS, FOR PHOTOGRAPHS, MIRRORS, PHOTOGRAPH FRAMES, CARDS, AND OTHER ARTICLES.

No. 5488. HARRY WHITFIELD, 68, Broad-street, Birmingham.—

April 15, 1887.

My invention is primarily a metal holder or clip constructed to hold or clip a glass plate, behind which is held a photograph, picture, or card. It is also constructed to hold or clip a mirror, photograph, card, or other article.

My invention is formed of two flat or round strips of metal or other suitable material. These two strips are rivetted or in some other way fastened together loosely at their centres so as to form a cross. Each end of each strip is formed as a hook. A spring which exerts an outward pressure is attached, one end of it, to each of the two strips at a position above or below the centre of each strip. On this spring being compressed the cross assumes a lengthened shape, and when the spring is released the cross is shortened and clips the article which it is required to hold. Thus, when it is desired to release the article held it is only necessary to compress the spring, and the cross lengthening loosens the hooks from the article held.

I make the spring in my invention in such a way that it can be used as an easel leg, but any suitably formed spring would actuate the cross in my invention in the manner desired.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
December 5	Notts	Institute, Shakespeare-street.
6	Carlisle and County	
6	Glossop Dale	Society's Rms., Norfolk-sq., Glossop
6	North London	Myddelton Hall, Upper-st., Islington
6	Sheffield	Masonic Hall, Surrey-street.
6	Sutton	Society's Rooms, 18, High-street.
6	Faisley	
6	Holmhirth	
6	Coventry and Midland	Coventry Dispensary.
6	Bolton Club	The Studio, Chancery-lane, Bolton.
7	Edinburgh Photo. Society	Hall, 20, George-street, Edinburgh.
7	North Staffordshire	Mechanics' Institute, Hanley.
7	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
8	Birkenhead	Free Public Library, Hamilton-st.
8	Bradford Amateur	Grammar School.
8	Halifax Photographic Club	Mechanics' Hall.
8	Manchester Photo. Society	36, George-street.
8	London and Provincial	Mason's Hall, Basinghall-street.
8	Ireland	Royal College of Science, Dublin.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION. On Thursday night, November 24, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. W. Cobb presided.

Mr. J. B. B. WELLINGTON exhibited plates which he had received from an acquaintance in the country who made his own emulsions; the plates had scum-like markings upon them.

Mr. A. COWAN believed the effect to be due to the method of coating; the emulsion had been poured on in too small a pool and the plate too slowly drained.

Mr. WELLINGTON had had similar marks after attempting to remove air-bubbles with the finger.

Mr. C. HEINRICH TRINKS had seen similar marks when the emulsion was applied too hot.

The CHAIRMAN remarked that too much spirit in the emulsion would produce a similar result, which was more likely to be seen when the precipitation method was employed.

Mr. WILLIAM ENGLAND said that such markings were usually due to carelessness of some kind.

Mr. A. P. HIGGINS exhibited his method of fitting the cork of a large bottle with tubes for use when the water supply is limited and the operator cannot work near a tap or sink. When the water has to pass through a smallish tube he is likely to use less of it than when pouring from a jug. Mr. Higgins then drew attention to a part of the money article in the *Daily Telegraph* of the preceding Tuesday in relation to the Cellerier-Parkes process, which stated about the Photographic Company, Limited, that 67,000*l.* were to be paid to the founders, of which 25,000*l.* would be in deferred shares. The capital of the Company was put at 100,000*l.*

The reading of these figures was received with great laughter, and various censorious remarks were made about them by different speakers.

Two questions in the box asked, "Is there any rule for determining the distance between the lamp and the condenser in the lantern for enlarging purposes?" "At what distance should a five-inch double condenser stand from a four-wick paraffin lamp?"

Mr. FRESHWATER replied that the distances depended entirely upon the focal lengths of the front lenses used.

Mr. A. HADDON said that to get the best effect the rays from the condenser should be made to intersect at the place of the diaphragm of the front combination of the lantern.

Mr. ENGLAND remarked that a small portrait lens formed a much better objective for the lantern than the ordinary objective supplied therewith.

Another question was, "What is the best developer for gelatino-bromide plates for lantern transparencies?"

Mr. J. J. BRONSHAW could recommend the ordinary washing soda and pyrogallol developer without sulphite; it gave warm tones and plenty of density with those plates prepared specially for photo-micrographic work; the proportions were—

Washing soda	4 ounces.
Bromide of potassium	40 grains.
Water	40 ounces.

Poured into the developing dish, after which about one grain of pyrogallol was added to each ounce. He used old washing soda which had gone quite white and contained no crystals of visible dimensions.

Mr. HADDON remarked that when carbonate of soda was recommended in formula it should always mean the pure dry salt, otherwise the operator would be using an uncertain mixture.

Mr. W. Few was elected a member of the Association.

The rest of the evening was devoted to the exhibition of lantern slides, including some by Mr. William England representing statuary at the late Paris Exhibition and elsewhere; Mr. Atkinson, views in Killarney; Mr. Cooke, rural English views; Mr. L. Medland, views in Northern Europe; Mr. H. M. Hastings, views at Brighton; Mr. J. B. E. Wellington, landscapes and sea views, many with natural clouds, which in most cases were printed upon the covering glass, and in all greatly improved the pictures; and Mr. A. P. Higgins, views in Portugal.

CAMERA CLUB.

The subject on Thursday, November 24, was *Enlarging*, opened by a paper read by Mr. D. P. Rodgers, Mr. E. Ferrero in the chair. There was an unusually large attendance of members and friends, over seventy being present.

The screens and walls of the Club were hung with enlargements to illustrate the subject of the evening.

In his paper Mr. RODGERS treated chiefly of enlarging by means of a lantern from quarter-plate to whole-plate size, and described his method for obtaining the best illumination. In going over the advantages of enlarging he held that the detail in a quarter-plate was too fine to be visible, but that all this detail was seen in the enlargement. Further, lenses of short focus—the smaller lenses—gave more intense pictures and greater depth than were obtained in large direct work. He preferred the limelight as an illuminator, as he found it gave more vigorous tones.

Mr. VALENTINE BLANCHARD then described his method of making enlarged paper negatives.

Mr. HEWORTH pointed out that the mixed gases gave a sharper image than the blow-through because of the larger flame of the safety jet.

The discussion was carried on until a late hour by Messrs. Bolden, Walker, Davison, Foulerton, Adcock, Sage, Beck, and the Chairman.

On Thursday, December 3, Mr. Andrew Pringle will read a paper on *Amateurs' Resolutions*. Meeting at eight p.m.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The annual meeting of the above Society was held in the Technical Schools, Bridge-street, Birmingham, on November 24, 1887,—Mr. R. H. Norris, M.D., President, in the chair.

Messrs. C. Mantell and A. Robinson were elected members.

The PRESIDENT, before calling for the annual report to be read, said, an annual meeting is dear to every Englishman; it is the occasion when we render the report of the past session, and we are your humble servants and have again to solicit your suffrages. It is an occasion when you on your parts are perfectly at liberty to re-elect us, and we should all be encouraged to air any grievance which you may have, or which you may think you have, during the past session. It is encouraging at least the principle of amity amongst us, and the contrary is always a bad thing; it is like a volcano which always has a tendency to upburst, and we do not want in this country social or intellectual problems to be solved by a chemical solution. Now I say that when a Society like this looks to air its grievances, or any grievance which a member thinks he has, then he should be entitled to state his case. We should be like men, and have a little forethought, and our little grievances should be got rid of, and if we manage matters in this way we shall have constant health and make sure that we shall be a flourishing body.

The annual report was then read, from which we make a few extracts.

Deducting resignations and those struck off the roll for non-payment of subscriptions, the register shows a total number of members and associates of 144 against 108 last year.

The average attendance at seventeen meetings has been forty-nine.

Among the papers read were the following:—*The Humorous Side of Photography*, Mr. W. D. Welford; *On Enlargements*, Mr. E. H. Jaques; *Printing by Artificial Light*, Mr. F. Birkett; *Retouching*, Mr. A. Nock; *Photography and Reminiscences of Birmingham Photographers of Bygone Days*, Mr. W. R. Osborn; *Outdoor Photography*, Mr. S. Delicate; *Stripping Films*, Mr. E. H. Jaques; and *Collotype or Practical Lithography*, Mr. E. C. Middleton.

On October 13 an exhibition (which is intended to be annual) was given of photographs taken by the members. This proved a great success, over four hundred pictures and transparencies being shown, upwards of one hundred and sixty being for competition in the nine classes for which prizes had been

offered. The whole of the pictures showed a decided advance, and the friendly rivalry should serve to stimulate the members to strive for still better work and to attain the goal of every good student of the art, "success." The Judges were Messrs. Walter Bredden, John Collier, and Harold Baker. The successful pictures and winners' names were:—Class A, "Best photograph of the successful pictures in Classes B to H," J. C. Huxley, M.D.; Class B, "Home portrait," E. Underwood; Class C, "Best instantaneous picture," W. J. Harrison; Class D, "Best landscape taken in 1887," W. D. Welford; Class E, "Best photograph from paper negative," F. Dutton; Class F, "Best contact print produced by development," J. C. Huxley, M.D.; Class G, "Best enlargement," J. Heaton; Class H, "Best transparency on glass or opal," J. Heaton.

During the year several excursions have been made and were well attended. During the year Mr. B. Karleese was compelled, owing to ill-health, to resign the co-Secretaryship, and the best thanks of the Society were given to him for his great assiduity in promoting the interests of the Society.

The Council recommend that the Exhibition for 1888 be held towards the close of the year, and have great pleasure in announcing that they have already received several offers of prizes for competition.

The papers promised are:—*Sunshine and Shadow*, E. C. Townshend; *Lantern and Slides*, J. Place; *Don't* (a paper for beginners), R. Godfrey; *Double Contact Printing for Lantern Slides*, W. Tylar; *The Land of the Midnight Sun*, E. H. Jaques; *Photographic Humours*, W. D. Welford.

During next year the Photographic Convention of Great Britain, having been invited by this Society, will favour Birmingham with a visit, and the Council trust that each individual member will assist with hearty good-will, so that the success of the Convention may be assured.

A summary of the income and expenditure of the Society is appended to this report, and the Treasurer's accounts show a balance in hand of 18*l.* 0*s.* 2*d.*, as compared with 12*l.* 5*s.* 6*d.* last year.

After passing new rules and alterations, the election of officers and Council was proceeded with, and the result was as follows:—*President*: Mr. R. H. Norris, M.D.—*Vice-Presidents*: Messrs. W. Septimus Harding, J.P., J. C. Huxley, M.D., and E. H. Jaques.—*Council*: Messrs. J. J. Button, James P. Heaton, E. C. Middleton, W. B. Osborn, J. Place, G. A. Thomason, W. D. Welford, and G. M. Duff.—*Librarian*: Mr. S. J. Holliday.—*Hon. Treasurer*: Mr. Thomas Taylor.—*Hon. Secretaries*: Messrs. J. H. Pickard and William Rooke.

In consequence of the lateness of the hour, the President postponed his address to next meeting, and a vote of thanks was carried unanimously.

The CHAIRMAN, in returning thanks, said, My little box must remain unopened to-night as time is short, but I will give you its contents later on. I think I have studied photography to some extent for the last forty years, and I still remain, as ever, attached to the art and science of photography. In this life a man who follows a public career, as many do in such a variety of ways, finds it almost impossible to devote any particular amount of time to one thing. It is perfectly true when your Secretaries called upon me I felt great hesitation in again becoming your President, because I knew I could not possibly give the time to it it ought to receive, I can well understand that if your President came more amongst you it would be conducive to the interests and progress of your Society, and I cannot readily understand why you continue to elect me as your President, seeing I am so deficient in what is so essential. From the kind feeling and recognition received at your hands I have tried to develop our mutual study. A man, too, must be remembered who gives himself up to exhibitions but cannot find time for research. The past three years of my election as President of this Society have created quite a diversion in my studies. It is a singular thing in connexion with the human mind that it runs in grooves for years, and if it is compelled to pass from one groove to another it continues to run in the old groove for a time, so that it has happened that many researches have only been partial. Since I have been elected your President photography has come in for the lion's share. Though I am not with you in body I am in thought, and I am working for the interests of this Society. Of that which I am doing for you at home this may be one day expounded to you here; that is the only justification I have in allowing myself again to be elected your President. I consider the position one of considerable honour, and I appreciate your kindness in electing me. At the same time, at the end of my term of office, if you will allow me, I should again be glad to retire into private life from this position, and let some younger blood and more energetic material take my place.

Votes of thanks were accorded to the Treasurer, the Librarian, the Auditors, and to the Secretaries, and the meeting terminated.

Dr. Norris's address and paper will be given early in the session.

CHESTER SOCIETY OF NATURAL SCIENCE. PHOTOGRAPHIC SECTION.

THE first winter meeting was held in the Dark Room, Grosvenor Museum, on November 9, when Mr. F. Evans, of Birkenhead, gave a demonstration of the preparation of lantern slides, at the close of which a number of slides were shown on the screen, eliciting a very warm discussion.

WALLASEY PHOTOGRAPHIC ASSOCIATION.

THE first annual supper and distribution of prizes in connexion with the above Association was held on Wednesday evening, the 23rd ultimo, at Seacombe, Dr. Cannell presiding.

At the conclusion of the repast the PRESIDENT proposed the toast, "The welfare of the Wallasey Photographic Association," and in doing so he descended in pleasing terms upon the work of the Association since its inauguration, which had evidently consisted not only of "talk," but also of hard work, as was clearly evidenced by the results before them. He hoped that at the next annual supper the number of members (twenty-seven) might be considerably increased.

Mr. WILKINSON, in responding to the toast, confirmed the President's remark regarding the Association's work, and joined with him in the hope that many of the residents in the district who practised the art would come forward and join them.

The prizes were then distributed to the successful competitors by Dr. Cannell.

In response to the toast of "The Judges," Mr. JOSEPH EARP remarked that the adjudication had been a pleasant task, the work put forward being exceedingly creditable to the Association.

After other toasts the remainder of the evening was spent pleasantly.

CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

THE second annual dinner of the Cardiff Amateur Photographic Society came off at the Angel Hotel, on the 17th ultimo. About forty gentlemen participated in doing justice to an excellent repast provided by Host and Hostess Bland. The President (Mr. Alexander Kellai) occupied the chair.

After the customary loyal and other toasts,

In responding to the toast of "Our Late President," Mr. ALLEN said that being chosen first President of the Cardiff Society was to him a source of great pleasure and pride, knowing, as he did, the very important part played by photography in all matters of modern science. Speaking as an engineer, he felt that the art was one that no engineering establishment of any importance could afford to ignore, and that most large firms now felt this so much that they are obliged to add a photographic department to their business in order to secure accurate delineations of their manufactures, as well as to duplicate their drawings and plans—the latter being generally done by the ferro-prussiate process. No matter how complicated the drawing or tracing might be, the photographic copies might be multiplied to any extent and in the merest fraction of time, thus rendering it easy to duplicate working drawings in a manner that was utterly impossible before adopting this invention. Photo-printing processes were now superseding lithographic drawing and wood-engraving to a very large extent, and scarcely an illustrated journal now goes to press without blocks thus produced being employed. We are thus enabled to see in print copies of original drawings direct from the hand of the artist—a matter of immense importance from an artistic point of view, and of no less importance when looked upon with an eye to its scientific usefulness, as by its means we can obtain correct data of progress of works, such as that immense triumph of modern engineering skill, the bridge now building over the Firth of Forth, so splendidly illustrated in the pages of *Engineering* recently, wherein the whole of the plates were executed by means of photography in such a way that for accuracy and artistic effect could not be equalled by any other art. Photo-lithography is now the only process employed in the large illustrations of the architectural papers, whilst the various forms of photogravure are so well known to most of you that you cannot fail to appreciate the splendid copies now to be obtained of original paintings taken direct by photography and translated into monochrome and sold at a comparatively small cost which as works of art can well hold their own with the best line engravings. He felt that the art of photography was much misunderstood by the general public, the majority of whom are satisfied with the most crude productions, and look upon it with a very indifferent eye; some artists even imagine that it is capable of doing much more than it is really capable of. For instance, photographers are blamed for their want of art knowledge when a landscape photograph is being criticised, because the values are not correct and the tender greys of the distant hills are completely lost, and the foreground and middle distance are a mass of black. Now, it is here where chemistry plays such an important part in the production of a picture, and scientific development should go hand-in-hand with our artistic knowledge to produce a pleasing result. He hoped the time had arrived when we might venture to extend the aims of our Society, and that the amateurs, &c. of Wales would join them in making the Society a truly national institute, and thought that such a title as the Photographic Association of Wales would be a very appropriate one.

Mr. VICE-PRESIDENT DYER then gave "The Scientific, Artistic, and Literary Institutions of the Town," which was responded to by Mr. SEWARD, who, in the course of his remarks, said it was appropriate to bear in mind that that toast was first proposed in a public manner in Cardiff at the first dinner of the Photographic Society last year, and it was worth remarking that at the municipal banquet just past the same toast took an important place on the list. Not only in that respect had the Corporation of Cardiff had an eye in the direction of their Society, but on the previous day an influential Corporation Committee, with Sir Morgan Morgan, Knight, at its head, had been placed in charge of the scheme for a National Institute for Wales, which was also first publicly mentioned at the Photographic Society's dinner before referred to, and with which their Society and several others were affiliated.

The toast, "Kindred Photographic Societies," was coupled with the name of Mr. H. J. Gifford, who, in replying, stated that the societies in London sprang from the Photographic Society of Great Britain, which could rank with the Royal and Chemical Societies, but that for amateurs he thought the less formal societies or clubs were preferable. Two years ago a new departure was taken in the way of photographic clubs when the Camera Club was opened. It was a social club as well as a scientific one, and had its own rooms, which included a dark room for the use of its own members and those of affiliated societies.

Mr. PARKER HAGERTY, in replying to the toast of "The Visitors," admitted that several of his brother artists did not put that value upon photography as an aid to their own art that the science was entitled to; speaking for himself, however, he must acknowledge he appreciated its work from practical experience.

Several gentlemen favoured the company with songs and recitations, and altogether a most enjoyable evening was spent.

YORKSHIRE COLLEGE PHOTOGRAPHIC CLUB.

THE second meeting of the session was held in the College on Thursday, November 24, when Mr. C. H. BOTHAMLEY, F.I.C., F.C.S., delivered his Presidential address. He reviewed the progress of the past year with special reference to orthochromatic processes, the permanence of prints, and Carey Lea's researches. A concise summary of the present artistic and industrial position of photography was then given, and the address concluded with a discussion of the claims of photography to rank as a fine art.

There was a very good attendance. The address was illustrated by a large collection of specimens, including Tolley's *On the Lonely Shore*, Sutcliffe's later *Studies*, Hollyer's portrait of Miss Terry, platinotypes by Keene, photogravures by Anau & Swan and the Berlin Photographic Company, collotypes

by Wagner & Co. and Waterlow & Sons, block prints by Waterlow & Sons, and typogravure by Bonssod, Valadon, & Co.

The next meeting, on Tuesday, December 13, will be devoted to a discussion on *Methods of Enlarging*.

Correspondence.

PHOTOGRAPHIC HERESIES.

To the Editors.

GENTLEMEN,—Your correspondents "Monitor" and "Free Lance" having pronounced their opinions on the paper I had the misfortune to read on the above subject, perhaps you would kindly allow me a brief reply. If professional critics would take the trouble to read twice (or even once in a generous spirit), I think they would avoid much misrepresentation and distortion; but then their occupation might be more than half gone.

Your correspondents appear to think that every paper read before a society should be learned and elaborate, forgetting that very useful class, written expressly to provoke discussion (not distortion), which may be fragmentary, disconnected, and incomplete.

"Free Lance" says, "It is all sheer nonsense to say that a good rapid plate is capable of doing all that a slow plate is, and much more beside." You will notice, gentlemen, he does not say he has not made the acquaintance of such a plate, or that such plates are not on the English market, but in effect, that such plates never have, or can be made. Let me remind him it was once "sheer nonsense" to say that steam could be made to exert a gigantic power.

I assert that plates are on the American market capable of making fully exposed negatives of any ordinary well lighted landscape or architectural subject with diaphragm $\frac{1}{16}$ in the $\frac{1}{8}$ part of a second, and of a quality equal to any slow plate of my acquaintance, and I am ready to take part in any friendly contest to decide this point. I may be wrong, but in this country am entitled to my opinion, even if an heresy. Either "Free Lance's" standard of a good negative is higher than mine, or my standard of "a good rapid plate" is higher than his. My experience is that the good rapid plate of to-day is not the coarse-grained plate incapable of rendering a wide range of tones without solarising, or giving vigour readily, as was the case two years ago, but a plate answering to the helm readily in development, and good for copying portraiture or landscape work. Copying with an automatic exposé is not such a ridiculous thing as "Monitor" supposes.

"Free Lance" denies that photographers generally are afraid to use rapid plates for general work; but it is a fact nevertheless, and may arise from a lack of experience with rapid plates, and also for want of proper appliances to accurately gauge short exposures. The signs of the times are, that as plates are being made more rapid and of better quality every year, the "good photographer" of the future will have no use for slow plates unless they are orthochromatic, your correspondent's unscientific intolerance to the contrary notwithstanding.

With reference to J. Traill Taylor's single lens corrector, it has no effect in my hands. No one will be better pleased than myself to make it succeed. If that gentleman, or any other, will give additional information, I shall be obliged. Is it possible that my lenses neutralised each other too perfectly?—I am, yours, &c.,

CHAS. TRUSCOTT.

U. S. America.

[It is a pity that, for the sake of his own reputation, Mr. Truscott had not thought it worth his while to make himself in some degree acquainted with the subjects about which he descanted so confidently in his paper; for example, what he designates the single lens corrector. Had he made inquiry of even any tyro in historical knowledge of lenses, he would have been told that many lenses had *long since* been made, publicly described with drawings, and even patented, the essential features in which consisted of a concave and a convex lens which, as a pair, possessed practically neither magnifying nor diminishing power, but yet gave such an amount of displacement as, when used with a third lens, to neutralise its tendency to give distortion. Probably he has never heard of the influence of correcting lenses employed by Sutton, Goddard, Ross, Dallmeyer, Grubb, Furnell, and several others, in the various non-distorting lenses introduced by these opticians. But let Mr. Truscott study the productions or the writings of these men, and he will be wiser in future. He is not the only young tyro who, with closed eyes, has struck his head against photographic rocks. Meanwhile, let him separate the component parts of his correcting lenses by a much wider ring.—Eds.]

DEFERRED DEVELOPMENT.

To the Editors.

GENTLEMEN,—I should be much obliged for a little assistance in developing. I have made a large number of exposures of various subjects (on half-plates) which I feel sure are about right for time, but as every negative takes me five to ten minutes, I don't know, with the limited time now at my disposal, when I shall have finished them. Is there any way of pushing the plates through quickly without spoiling them? Your reply will greatly oblige.—I am, yours, &c.,

J. C. HOLMES.

[See leading article upon the subject in present number.—Eds.]

THE HISTORY OF THE GELATINO-BROMIDE PROCESS.

To the Editors.

GENTLEMEN,—Gustave Legray's book had been examined by me before asking Mr. Jerome Harrison for the source of his statements, and I could find nothing about gelatine therein, so he would oblige by, as soon as convenient, giving exact references to his authority for his record.

Among the very early gelatine processes not mentioned by him, was a celebrated one by Poitevin. Excellent prints by a gelatine process on paper were obtained in primitive days by Baldus. The few gelatine processes other than Gaudin's before 1863 I will examine to see if they contain anything about the use of an emulsion.

The broad facts appear so far to be that there were two classes of gelatine processes. In the one, in the endeavour to find a substitute for collodion, excess of nitrate of silver was used and acid development. Gaudin, in 1861, went beyond this, by using an emulsion from which all alkaline nitrates were washed away. He, however, then added excess of nitrate of silver, and used acid development. Gaudin was probably the first who used a washed gelatine emulsion. The other class, the precursors of the present dry plates, contained an emulsion with no excess of nitrate of silver, and included alkaline development.

The first class was found to be exceedingly slow in the camera; it was almost exclusively used and promulgated for positive printing, and sometimes without development. So far as anything before the public in the recent utterances is concerned, the first plate of the second order of processes was made in January, 1868. In Mr. Jerome Harrison's recent historical articles, he does not state who devised the system of washing the gelatine emulsion made without excess of nitrate of silver. It was a vital step in the process, so it would be interesting if he would furnish the particulars.

W. H. HARRISON.

REMOVAL OF SULPHATES FROM PYRO SOLUTIONS.

To the Editors.

GENTLEMEN,—Referring to your leading article of this week on the removal of sulphates from pyro solutions by means of chloride of barium, I fear it will not be found that this substance is a desirable, or even innocuous, constituent of the developer. In the course of a research which I once had occasion to make on the reactions of the tannin group, I found that many of these bodies, including pyrogallol, though without action alone on barium and calcium chlorides, yet gave on addition of ammonia the reactions peculiar to baryta and lime, and not those produced by ammonia alone. It has been shown that these alkaline earths do not satisfactorily replace the alkalies in development, but rapidly give turbid solutions. It is possible, however, that in presence of sufficient sulphite, this reaction may not occur, since I have found that the use of even five per cent. of bisulphite of soda in a ten per cent. pyro solution enabled me to use an excessively hard water without injurious results in the developer.

The reaction is very curious from a chemical point of view, since ammonia alone cannot displace baryta from its chloride, but is enabled to do so by the added affinity of the tannin or pyrogallol for the baryta. It is analogous to the fact that while caustic ammonia will not precipitate baric and calcic salts, carbonate of ammonia does so completely.

It seems rather dubious whether it would not be wiser not to keep the pyro so long, rather than to try to revive it when spoiled, or to use acid sulphates instead of neutral ones, since the former are more stable compounds, and have beside a far greater preservative action on the pyro. If, however, "the game is worth the candle," I would suggest the use of neutral sulphite of baryta, which is insoluble itself, and would simply restore the original sulphite of soda, and form insoluble sulphate of baryta. It could easily be obtained sufficiently pure by precipitating baric chloride with sulphite of soda and slightly washing on a filter.—I am, yours, &c.,

HENRY R. PROCTER.

Tynemouth, November 26, 1887.

THE PLATINOTYPE PROCESS.

To the Editors.

GENTLEMEN,—If Mr. A. Pringle's statement made at a recent meeting of the North London Photographic Society is correctly reported, may I beg Mr. Pringle to be so kind as to send to the Platinotype Company a portion of a print or of prints of which he has succeeded in materially reducing the image, together with some of the solution of sulphuretted hydrogen (if he has used a solution of it) with which he has so acted upon them. In the absence of the latter, perhaps he will describe the method of production of the preparation he used. Some prints so acted upon would also interest.

In reference to Mr. F. W. Cox's useful paper on *The Platinotype Process*, may I be permitted to explain the reason why the Platinotype Company recommend the use of "neutral" potassic oxalate? The reason is that the "neutral" salt causes the image to adhere better to the paper at the time of development, while, if the acidified salt is used there is no tendency to precipitation of the iron salt, but a powerful solvent is formed having what amounts to a restraining action upon the developing or reducing power, so that the metallic platinum falls away irregularly from the surface, being reduced to some extent while its salt is in process of removal from the surface of the paper.

In this way, and by worn out acid developing solutions, many cold,

coarse, grey, and abominably uneven and patchy and even streaky prints have been and are being turned out. It is not far wrong to say that an acid bath has much in common with a cold bath. I do not think it well, with the Platinotype Company's present papers (which are different in behaviour to those made by Captain Pizzighelli), to use an acidified bath. But, as Mr. Cox states, the appearance of a print is so much a matter of taste.

Mr. Cox is quite correct in stating that an acid bath gives "brilliance" (if by "brilliance" we then mean purer "whites" or less half tone); but the "blacks" are generally damaged by it, as well as the otherwise even fineness of the print. If, however, the paper is old, and the "whites" are degraded on development, an acid bath might effect an improvement; for with old paper there is a firmer hold of the platinum and iron salts.

I trust that these few remarks may be useful to some of your readers; otherwise they should not blame the paper for certain defects, but the bath.

I may add that the instructions of the Company are compiled with a view to the best technical results; any one may use other plans to suit his taste or requirements, but it should be borne in mind that only by adhering to the Company's directions can the results they state their papers will give be achieved.—I am, yours, &c.,

November 28, 1887.

HERBERT B. BERKELEY.

"FREE LANCE" ON SPECIFIC GRAVITY.

To the Editors.

GENTLEMEN,—In the battle of the standards, "Free Lance" singles me out for a combatant. Allow me to parry his thrust as best I may.

He is displeased with my "wonderful exactitude," and says that my correction for temperature is wrong unless I can show that Carius took a temperature other than 60° Fahr. as his standard. This roundabout expression makes me suspect that "Free Lance" is himself uncertain as to the standard temperature used by Carius. I do not know, but presume he was or is a foreigner, through the peculiar name and his use of centigrade units of temperature. If the correction be wrong, then is the expansion of ammonia on further dilution much more manifest. Will somebody who knows kindly say who Mr. Carius was, and what was his standard?

Had I omitted the correction, somebody would have pointed out my glaring error, and without himself applying it would have said that my figures proved nothing.

For my own part, I much prefer a mean temperature, as 60° Fahr., to the wintry standard of our neighbours. I am waiting for a developing formula from France, normal at 0° C., with corrections for temperature.

The definition of specific gravity as the weight of a unit of volume is too awful to be passed by, says "Free Lance;" it is nevertheless correct. The fact is that specific gravity is defined in two ways, either definition being used as may be found convenient. Similar instances are common: Euclid's definition of proportion is unlike Colenso's; Hutton, Drew, and Clifford define an ellipse in different ways. These definitions are not incongruous, and we may use which we like. Similarly with specific gravity, it may be defined as a weight or a ratio. I did not make the definition, but use what I have to hand.

Clearly "Free Lance" is not Professor Donkin, or he would not have quarrelled with the definition. Neither is he Webster, or he would not talk about depicting in place of defining, as if synonymous. Neither is he a leisurely reader, or he would not misquote "looking the subject up" for "looking into the matter."

Who is he, "At all at all, I tell you?"

Once more: "Free Lance" suggests that I might have said "density is the mass of a unit of volume." Quite right; now, multiply by gravity (32.2 feet per second) and we have at once "specific gravity is the weight of a unit of volume!" If this statement seem a puzzle, I would suggest that "Free Lance" "look the subject up."—I am, yours, &c.,

4, Camp-street, Lower Broughton, Manchester,

R. C. PHILLIPS.

November 27, 1887.

THE PHOTOGRAPHIC COMPANY, LIMITED, AND THE CELLERIER-PARKES PROCESS.

To the Editors.

GENTLEMEN,—I am much obliged for your remarks in connexion with this process. I have done my best to prevent the insertion of any misleading heading or statement, and, again, I am surprised and annoyed to find that the agent who abridged and published the amended prospectus should not have followed the wording of the prospectus settled by me on behalf of the Directors of the Photographic Company, Limited, who are most anxious that no misdescription should appear. From the prospectus you will see that no such words as "photographing in colours" or "photography in colours" are used, and the processes are plainly described as "for improvements in the production of coloured photographic pictures." As soon as attention was drawn to the error, instructions were given to the advertising agents to withdraw all such advertisements, and to give correct definitions in accordance with the prospectus approved by the Board. This was forthwith done. You will kindly note that the press notices sent with the prospectuses also define the true character of the processes. The Directors much regret the mistake, feeling assured that the patents will succeed on their own merits.—I am, yours, &c.,

E. W. PARKES.

3, Salters Hall-court (opposite Cannon-street Station), London E.C., November 29, 1887.

CUTTING A BOTTLE.

To the Editors.

GENTLEMEN,—I notice in your report of the meeting of the London and Provincial Photographic Association that the members who took part in the discussion seemed to be "at sea" as to the best means of cutting a bottle in two. A very simple but effectual plan is to take a piece of twine about one and a half yards long, wrap it twice round the bottle, let one person take hold of one end of the twine and get another to take hold of the other end. Then with a sort of see-sawing motion the part becomes so heated that when the bottle is dipped into water the parts fall asunder. If it is desired that the bottle should be cut in a certain place, I usually cut a round hole in a piece of wood large enough to admit the bottle; the string working on the glass and against the board ensures the cut being a clean one. If, however, the see-sawing motion is continued long enough the parts will fall asunder, thus rendering the dipping in water unnecessary. If time is no consideration this is by far the best plan, as I sometimes find that hock bottles are thicker on one side than the other, and invariably where they are so the water bath starts a crack up the bottle.

I have cut a large number of hock bottles in this way and converted them into lamps, and have found them useful when enlarging or using bromide paper, affording a safe light.—I am, yours, &c., AMATEUR.

BOYCOTTED MEDALLISTS.

To the Editors.

GENTLEMEN,—I have just received a prospectus of an exhibition to be held in the spring at Liverpool, under the auspices of the Amateur Association. This document contains a rule which seems intended to exclude most of the best work that has been done during the year. It runs thus:—"No picture shall be eligible for competition which has taken a prize at any public competition, the Council being desirous of encouraging the exhibition of new work." It is very praiseworthy of the Council to endeavour to promote the production of novelties, but what new work does it expect to have done between now and the middle of next February? The best recent work has already been medalled at London, Falmouth, or Dublin; the Liverpool exhibition, therefore, will have to fall back on the refuse of these exhibitions to make their show attractive. It will be a great chance for the second rate—the millennium of the mediocre, as a friend who read the paper over with me called it.

Of course, no producer of a medalled picture who respects himself and his art would think of sending pictures which he is so pointedly told are not wanted.

If medals are to be given at exhibitions it seems only fair that the best exhibits shall have the same chance of winning them as the worst, and, as pretty well all the available good work of this year has been rewarded, there will be nothing left to compete for the Liverpool medals but inferior productions, thus bringing medals even lower down than they have already got, and that is indeed low, now that trading firms and struggling journals have to purchase their customers by offering them medals through amateur societies.—I am, yours, &c., A MEDALLIST.

APOLOGY.

To the Editors.

GENTLEMEN,—I desire to tender my unreserved apologies to Mr. W. H. Hyslop for my letter published in the *Photographic News* of the 21st ult., relative to his photographs of the *Thistle*, as the statements or insinuations made therein imputing dishonourable conduct to Mr. Hyslop are, I find, without the slightest foundation in fact.—I am, yours, &c., A. J. WEST.

Southsea, November 25, 1887.

Answers to Correspondents.

NOTICE.—Each Correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a NOM DE PLUME as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

E. J. R.—The maker will supply all particulars.

NOTICE.—No notice taken of queries not endorsed by name of sender.

F. C. S.—Nothing to prevent you from opening such a business as suggested. See answer to "Photo."

W. MOULTR.—Remove the spirit lamp by drawing it back a little after ignition of the magnesium has taken place.

J. W. DOLLAR.—Not having seen any lenses by the maker named, we cannot advise, but we prefer the "rapid" to the other.

E. W. M.—Much warmer tones can be obtained on wet collodion transparencies by immersing them in a solution of sulphide of potassium than in one of platinum.

E. D. SKELTON.—It is impossible to predicate the degree of success that may attend the venture. Everything depends upon personal skill, business tact, and a fitting locality.

A. Z. (Durham).—Enamelled paper suitable for the purpose may be had from most wholesale stationers. Messrs. Spicer Brothers, Bridge-street, E.C., will supply your wants.

R. R. C.—Pine will do very well for making a camera, but, to secure the same stability as with mahogany, a greater thickness will be required, so that the advantage in weight will not be so great as you imagine.

PHOTO inquires: "Can a person who is not a certified chemist carry on a business in photographic materials and sell all the necessary chemicals?"—Yes, except in those cases in which the Poisons Bill is operative.

J. MARES.—Any good paper coated with plain gelatine will do for transfer paper for double transfer in carbon printing, provided it be soaked in a solution of alum before it is applied. This was the plan employed by the late Mr. Jabez Hughes in his daily practice.

S. ALDUS.—Several practical articles on albumenising paper appeared in our volume for 1884; you cannot do better than refer to them. Any information we could give you in this column would not be of much service in enabling you to prepare the paper on a commercial scale.

C. J. SOMMERS.—A lens of the "rapid" type will do quite well for enlarging with; indeed, it is one of the best forms that can be employed. It is always a good plan to use a lens for enlarging that will cover a size or two larger than the picture to be enlarged. The focal length of the lens is governed not by the size the picture is to be but by that of the original.

S. A.—The preparation of canvas as sold by the artists' colourmen is not easily done on a small scale. Unless your consumption is much larger than your letter leads us to surmise you will find it more to your advantage to purchase it ready prepared. Then you will get an uniform and reliable article. If it would be more economical in your case, you can purchase the canvas in rolls of various widths.

X. Y. Z.—1. Simply cement the two glasses together with paper round the edges.—2. The light will be sufficient if the exposure is long enough to suit the aperture of the lens.—3. No mountant will really prevent the print from cooking, but one of a solution of gelatine in which a large proportion of alcohol takes the place of water will reduce it to a minimum.—4. No doubt the deposit or stain is silver. Try a solution of cyanide of potassium; possibly that may take it off.

W. N. writes: "I should be much obliged if you would tell me what is the best battery for my purpose. I use a small incandescent lamp in my dark room, not continuously, but I turn it on now and again for judging density (as I use daylight for developing), so a battery that polarises and recovers itself will do; but I do not want anything like a bichromate or chromic acid battery, where the carbon and zinc have to be lifted out, as it must stand out of reach; nor do I want a battery which gives off fumes, as it must stand in the dark room. My lamp, I should say, is about two or three candles."—We should recommend either Schanschiff's battery or one supplied by Mawson & Swan.

RECEIVED.—Liverpool Amateur Photographic Association.—In our next.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—The next meeting will take place on Tuesday, December 6, when Mr. T. Charters White will lecture on *Photomicrography*. Visitors are invited.

THE JENNINGS'S FUND.—The following additional contributions have been received by Dr. Maddox, Greenbank, Park-road, Portsmouth, Southampton, and Mr. Andrew Pringle, Cromwell House, Bexley Heath, Kent:—Edward C. Bousfield, 10s. 6d.; B. Vivian, 10s. 6d.; J. Thomson, 1l. 1s.; *Employees of J. Thomson*, 9s. 3d.; Mrs. H. B. Pritchard, 5l. 5s.

FORTHCOMING EXHIBITION.—The Dundee and East of Scotland Photographic Association purpose having an exhibition of photographs and photographic apparatus in the Art Galleries, Albert Institute, Dundee, commencing on February 16, 1888. There is to be a liberal donation of gold, silver, and bronze medals. Prospectuses from the Hon. Secretary, Mr. James Rattray, 82, High-street, Dundee. Entries close in January.

PHOTOGRAPHY IN COURT.—At the Bow County Court, before Mr. Registrar Hore, the case of Wright v. Wright was heard. The plaintiff is a clerk, living at 32, Percy-street, Forest Gate, the defendant a photographer, of 1, Sebert-road, Forest Gate, and the claim was for 5s. 6d., for balance of money paid for goods not delivered. It appeared that the plaintiff had the family group taken at the defendant's studio in Forest Gate; there were to be a dozen cards for 15s. 6d., and the plaintiff paid the money, but when the cards had been finished he refused to accept them, saying they were not satisfactory, and they were left on the defendant's hands; for that reason the defendant gave him back 10s., and he now sought to recover the difference of 5s. 6d., as balance of money paid for goods not delivered. The defendant maintained that the photograph was very correct, and produced one for the Registrar to look at. The learned Registrar, having looked at the plaintiff and at the photograph, observed, "I think I never saw a more exact likeness or a better picture, and I must give judgment for the defendant. No costs."

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1440. VOL. XXXIV.—DECEMBER 9, 1887.

HOME-MADE STRIPPING FILMS.

In view of the apparently established position now filled by paper as a negative support, and of the additional fact that there still remain a few who take pride in the preparation of their own sensitive films, not improbably the subject of home-made stripping films may possess an interest for some of our readers. At any rate, we may venture to give the results of some experiments in that direction we were recently led to make as a digression from another branch of work.

Stripping films are by no means new, either in principle or in detail, so there is no fear of infringing any patent rights, even if our methods be followed by other than amateurs. But the principle has been variously applied, as by the late Mr. Woodbury, who stripped his negatives *after development* and retransferred them to glass when desired for printing purposes; while Warnerke's sensitive films were prepared upon a temporary paper support, upon which they were exposed and developed, to be afterwards stripped and used as translucent "film" negatives or transferred to glass, as might be preferred.

Woodbury's method, by means of which he produced the exquisite series of Italian views exhibited by him some ten or twelve years ago, was devised for the purpose of lessening the trouble of the travelling photographer, and is specially applicable to collodion negatives. In Mr. Woodbury's case, he employed collodion emulsion, and, travelling with a bottle of emulsion, a dozen or so glass plates, and a supply of prepared transfer paper, he was equipped for the production of as many negatives as if he had been hampered with innumerable packages of extra plates.

His *modus operandi* was simplicity itself, and our recollection of a first trial of the transfer paper sent to us by Mr. Woodbury is that we experienced not the slightest difficulty in operating successfully, even upon negatives that had not been specially prepared for stripping; indeed, there is hardly any need of such preparation. The glass is cleaned in the ordinary manner, and preferably polished, either with a solution of wax in ether or benzole or with powdered talc; this is not absolutely necessary, but it facilitates the subsequent stripping. It is then coated with collodion or emulsion and exposed, either wet or dry, the whole process being conducted in precisely the same manner as for an ordinary glass negative.

After fixing and washing, the preparations for stripping the film are commenced. A sheet of the transfer paper is cut to size—about three-sixteenths or a quarter of an inch smaller each way than the glass—and soaked in water until soft. There is no mystery or difficulty in the preparation of the transfer paper; it is merely ordinary paper of moderately

smooth texture coated with plain gelatine and allowed to dry. This, when softened by soaking in cold water, is squeegeed into intimate contact with the negative and permitted to dry spontaneously, or, at least, without the application of any considerable heat. When quite dry, the edges of the paper are cut round in the usual manner, and the paper, bearing with it the negative image, slips readily from the glass, leaving the latter ready to be cleaned and recoated with emulsion for another exposure.

If a suitable paper have been selected at first, the negative may be allowed to remain attached to its new support, which may be rendered translucent by any of the well-known methods if desired. Or the paper may be used merely as a temporary support until such time as it may be convenient to retransfer the images to glass or other permanent support, when the collodion side of the flexible negative having been cemented to the new surface by means of indiarubber solution, the paper is easily removed, soaking first in cold and eventually in warm water.

This method varies very considerably from the more modern stripping films, but chiefly in the fact that with the latter glass does not necessarily play a part. Warnerke's films more nearly realised the modern idea, consisting as they did of a translucent film—itsself spread upon paper—which formed the support for the image throughout the whole of the operations it had to undergo. But this was unnecessarily troublesome in preparation and not likely to meet the requirements of the amateur manufacturer.

It has long appeared to us that with certain precautions the simple transfer paper of Woodbury would answer all moderate requirements. That is to say that any one who wished to prepare his own films either with gelatine or collodion emulsion, would find gelatinised paper a convenient and suitable support. Of course the difference, physically and chemically, between collodion and gelatine has to be borne in mind, but, as we shall show, the gelatine transfer paper is equally applicable to both purposes.

First as regards the preparation of the transfer paper, as we shall continue to call it, though it may be used as the final support. If it is to be used merely as a temporary support, the nature and quality of the paper are of very little moment, provided it be fairly even in surface and of sufficient strength to bear handling when wet. If, however, it is intended that it shall form the final support, attention must be given to its thickness and texture, in order that the translucency of the finished negative may meet the printing requirements, and its definition not be materially interfered with by unevenness of grain or fibre. Where *paper negatives* are intended to be made

we should in all cases advise a proper "photographic" paper to be employed, but for other purposes any fair ordinary quality of paper will answer perfectly well.

The strength of the gelatine solution, too, is a matter for some consideration, and may be varied in accordance with the particular purpose to which the transfer is to be applied. If a simple transfer paper for collodion films, either for stripping them after exposure *à la* Woodbury, or for holding them during exposure and development only, a simple twenty or thirty-grain solution, with a few grains of sugar to each ounce will answer well. If the paper is to be used in connexion with *gelatine* negatives a stouter layer of soluble gelatine is desirable in order to lessen the risk of the negative becoming permanently attached to the paper support. When the paper is to remain as the final support, too, it is advisable to resort to a stronger solution of gelatine, in order that it may remain more completely upon the surface and not sink in and fill the pores of the paper so as to prevent its being subsequently rendered translucent. For these purposes a strength of forty or even sixty grains to the ounce will not be too much, and the addition of from fifteen minims to half a drachm of glycerine to each ounce will improve the flexibility of the paper and prevent its becoming brittle on drying.

The coating of the paper with gelatine presents no difficulties beyond those of keeping the solution at a proper temperature and preserving the coated paper from dust during drying. It must be borne in mind that the extreme care necessary in preparing sensitive films, or films of emulsion, is entirely wanting here, all that is needed being a tolerably smooth and even surface. The fluidity of the gelatine must be kept up by immersing the dish containing it in a deeper one holding hot water, or by other means that will commend themselves according to circumstances. With regard to the avoidance of dust, we find no better plan than to coat the paper at night and to allow it to hang in a warm room during the still hours when no one is moving to stir up the dust. Two or three hours will suffice to complete the drying under such circumstances.

The papers if cut to sizes may be simply floated on the warm gelatine until limp, drained for a few seconds, and laid upon blotting paper until set, after which they are hung up to dry. If very large sheets, or continuous lengths, are required they may be managed without a great amount of trouble as follows:— Let the dish or trough of gelatine be placed on a shelf or platform at one end and about a foot below the level of a table of convenient length; take the sheet or length of paper and float one end of it upon the dish of gelatine, placing upon it a light wooden roller of sufficient weight to ensure that the paper comes in contact with the gelatine without sinking below the surface. If when this has been done the end of the paper is carefully raised to the level of the table and then slowly drawn along its surface, it will be found that a smooth and even coating is given which sets very shortly after leaving the trough, and enables the coater to hang it in "festoons" to dry at the opposite end of the table. It is scarcely possible to perform this single handed, but we have seen a length of nearly twenty feet perfectly coated and hung in a small room by a couple of operators.

In coating large sheets or widths it is not necessary to provide large porcelain dishes, nor, indeed, to employ dishes at all. There is nothing to prevent the use of metal as the material out of which to construct the gelatine holder, and in order to avoid a large bulk of solution the receptacle may be made in the form of a trough sufficiently long to accommodate

the width of the paper to be coated, which is drawn through it in the manner described.

The paper, if freely exposed to the air in a room which has been warmed during the day, will dry as we have said in two or three hours, and if the material used be of proper quality will give no trouble in curling or cockling, especially if a due quantity of glycerine be used. If, however, it be attempted to utilise extremely thin paper, except for sheets of the smallest size, it will be found necessary to roll and smooth the paper after drying, and to preserve it constantly under pressure. An ordinarily stout paper coated with a forty-grain gelatine solution when completely dry simply requires rolling up, when it will quickly rid itself of any chance inequalities or irregularities formed in drying, and may be kept indefinitely if preserved from damp.

In this manner an amateur or small consumer may prepare in a single evening sufficient transfer paper to fulfil his negative and other requirements for a season, and at the same time feel certain that there is no chance of its deterioration, as in the case of the sensitive films. Nor does it occupy the space of glass nor require to be cleaned and polished, but there it is ready for coating when required.

Next week we shall speak of the methods of applying this transfer paper to photographic purposes in connexion both with collodion and gelatine films.

PHOTO-MICROSCOPIC STEREOGRAPHS.

ON the occasion of Mr. Charters White delivering a lecture on photo-micrography before the North London Photographic Society on Tuesday evening, a conversation which ensued gravitated in the direction of photographing microscopic objects in duplicate, and under such conditions as to enable them to be examined in a stereoscope, showing the same degree of relief or rotundity as that experienced when employing a binocular microscope.

This is a department in photo-microscopic science which does not appear to receive any attention at present, and yet there are few of the cognates of the science more worthy of notice or which will bestow greater pleasure or profit than this.

There are innumerable bodies in the world of small things which can only be properly observed, so as to realise their configuration, by a binocular microscope; and in the case of such objects, no matter how much they may be enlarged by photography in the usual way or with what perfection their detail may be rendered, they still afford a very inadequate idea of their form.

Our object at present is to point out, briefly, some methods by which the possessor of an ordinary monocular microscope may be enabled to photograph any suitable object with all the relief as seen in the finest binocular instruments, and this, too, without incurring much expenditure for costly appliances. Premising that the method to be described is intended for employment with low powers, we shall explain its principle of action by a simile we employed many years since, when we had occasion to introduce it to the notice of our readers of those days. Let a bust or statuette be placed on a table at a distance of a few feet from a single fixed camera and a negative be taken. Now, without moving the camera, rotate the statuette on its axis in the slightest degree, and then take a second negative. Prints from these two negatives will, when mounted side by side on a stereoscopic card mount and examined in the stereoscope, show the image in all the solidity

that could be desired, the amount of relief being determined by the extent to which the original object was rotated previous to the second negative being taken. Reasoning from analogy we now proceed to apply this system to the production of micro-stereographs.

The object slide must not be placed flat down directly on the stage of the microscope, but upon a secondary or super-stage so constructed as to allow of the small platform upon which rests the object slide to oscillate from right to left within a limited sphere. The one we constructed for the purpose is made of thin brass pivoted at its two sides into guiding side pieces, the axis of motion being adjusted so as to coincide with the object to be photographed. Having focussed the object, and using a diaphragm in front of the objective so as to increase its penetration, the first photograph is taken, when the little see-saw slide holder is tilted to one side, after which it is tilted to the opposite side preparatory to making the second exposure. The amount to which the tilting takes place must be only very slight, else will the apparent solidity of the image when subsequently examined in the stereoscope be exaggerated.

Success in this is ensured by employing an objective of small angular aperture, or, should it be too wide, limiting this otherwise excellent quality by a diaphragm cap being slipped over the end.

Another way by which stereoscopic photo-micrographs can be obtained by a monocular microscope is to employ an objective having an effectively large front lens and covering it with an easy-fitting cap, having in it an aperture so much at one side as to cover up one half of the lens. When making the first exposure the cap is turned so as to uncover one side of the lens, and is rotated half a turn before taking the second negative. The resulting pair of pictures will be stereoscopic.

There are several other methods which may be employed, and which are more especially adapted for the higher powers; this article is, however, mainly intended for the photo-microscopic aspirant with limited appliances.

On another page will be found a letter from Mr. Samuel Fry, indicating what, in his opinion, will remove the annual vexatious squabbles about the distribution of medals at the Exhibition of the Photographic Society. It is simply to make the awarding of medals the great popular function of the members of the Society, in which every one not only has a right but should feel it his duty to personally participate. The larger proportion of members are perfectly competent to form a just and reliable opinion on the matter, and as Royal Academicians and Members of the Water Colour Society have, as jurors, equally failed to give satisfaction, it seems very reasonable to hope that the system proposed by Mr. Fry, and which is understood to be favoured by many members, may with advantage be now given a careful trial.

REMOUR has it that a gentleman who applied for, and received, 500 shares in a certain Company recently formed, has instructed his solicitor to demand an immediate return of his money, failing which recourse will be had to legal proceedings.

SCIENTIFIC journals have lately contained descriptions of several new processes involving the use of pyroxyline. Not the least singular is the one for the production of artificial silk, a process for which is described in *Comptes Rendus* by M. Chardonnet. He makes a collodion of just about the strength of the photographic preparation, and adds to it one per cent. of a ten per cent. solution of chloride of iron, and about half that quantity of tannic acid. The whole is then

filtered in a closed apparatus, and the liquid discharged through a fine glass or platinum nozzle into water acidulated with one half per cent. of nitric acid. The thread so produced is then rapidly dried and wound up.

A STILL more remarkable use for the neglected chemical, however, is to be found in the coating of ships' bottoms with celluloid, the main base of the manufacture of which, as our readers are aware, is pyroxyline. It is stated that experiments have been made with this substance lasting over six months, and that in the places where it was used its preventive action was complete—fouling was entirely prevented—while other parts of the vessel unprotected during the same period were freely covered with marine vegetation. The celluloid is produced for the purpose by a French Company, who offer it at the price of nine francs per square metre (that is less than one shilling per square foot) one millimetre thick.

OUR readers will remember the great interest caused by the announcement, now some years old, that oxygen had been spectroscopically discovered in the sun. Dr. Henry Draper had convinced himself that there were bright lines in the solar spectrum corresponding to the bright lines of oxygen, whilst his brother, Professor J. C. Draper, had identified the oxygen with faint dark lines. But Messrs. Trowbridge and Hutchins have been working with the huge concave grating of Professor Rowland (which has been already described by us in connexion with the large solar map he is producing by photographic aid), and they state that they "have photographed the sun's spectrum every day that the sun has shone for nearly five months without finding a line that could with certainty be pronounced brighter than its neighbours." The bright bands have vanished, and the above two observers say further that there is no real correspondence between the oxygen lines and the dark lines Professor J. C. Draper identified with them. Thus by means of increased instrumental power, aided by photographic methods, the discoveries of a decade ago are shown to be figments.

PROFESSOR PRITCHARD has by the same means been able so to simplify some processes of observational astronomy as to greatly reduce the time hitherto involved in their application. One most interesting and difficultly worked of astronomical operations is the ascertaining the parallax of certain stars. It is not desirable here to do more than allude to the laborious and time-absorbing process as ordinarily conducted. Professor Pritchard took four negatives, on each of eighty-nine nights, of a certain star, and obtained results of a gratifying nature, the photographic parallax being the mean of those obtained by micrometrical measurements of other observers. He next made a certain theoretical selection of the negatives, reducing them to those taken on ten nights. The mean results did not differ from those obtained in the eighty-nine nights, and he has henceforth determined to confine the observation to five nights on each of four periods of the year. It is thus evident that a far greater number of parallaxes will be able to be ascertained in a twelvemonth—perhaps those of ten to fifteen stars. His detailed results are not yet published, but incidentally his paper—read at the Royal Astronomical Society's meeting—states that three per cent. of the plates were found to be injured and unsuitable for the inquiry, and also that he should economise both time and labour in the future by taking two impressions on the same plate.

OUR readers have been made aware, from time to time, of the remarkable results obtained by M. Marey in his instantaneous photographs of various animals when progressing from place to place. A large number of photographs of men in the act of walking, running, and jumping, have been given, and also, *à la* Muybridge, of horses in motion in various kinds of gaits. But, perhaps, the most interesting series of the whole is that relating to the flight of birds. In *La Nature* (in last week's issue) a number of illustrations taken from M. Marey's negatives are given, and they show a most remarkable and interesting set of positions. M. Muybridge's pictures were

a great source of wonderment and amusement, when first introduced, on account of the very strange shapes into which the limbs of his horses seemed to be contorted; and here, instead of those beautiful pictures of birds with their pinions extended above the body as is wont to characterise the Western representations of bird-motion (the Chinese and the Japanese draw their flying birds indifferently with wings either depressed or raised) we see their pinions in as many and as remarkable positions as those of the celebrated horses above alluded to. In some the wing tips are high in air, in others quite low and beneath, and, indeed, in front of the body; while, again, in still different views of the same bird we seem to see nothing but wings apparently extended to imitate an umbrella. The pictures of the pelican are particularly ludicrous. It is desirable again to point out with regard to such photographs that their value is not for artistic but for physiological uses.

PHOTO-CHROMATIC PROPERTIES OF SILVER CHLORIDE.

WHEN a well polished plate of silver is dipped into a five per cent. solution of iron chloride it acquires a slate colour. The plate is taken out of the solution after ten seconds, dried quickly (without heating), and covered with red, emerald, orange, and cornflower-blue glass. In sunshine the colours appear on the plate after a few minutes. Over-exposed plates, especially blue ones, are brownish. The colours dissolve readily in aqueous ammonia. If the plate is heated before exposure, it acquires first a violet and then a red colour, and at the same time partly loses its sensitiveness to yellow and green light. The experiment is suggested as suitable for a lecture experiment.

G. STAATS (*Berichte*, 20, 2322-2323).

—*The Journal of the Chemical Society.*

ECHOES FROM THE SOCIETIES.

I HAVE had frequent occasion in this column to comment on the performances of reporters, and I cannot help opening this communication by a further reference to one of their vagaries. At a meeting of the Walthamstow Photographic Club a changing box was exhibited which, we are told by the reporter, called "for more than passing notice." Then follows the "more than passing notice"—"Combining several novel features," the reporter says, "with a considerable amount of ingenuity in its construction which should render it a really useful and efficient accessory to the photographic tourist." That appears to me a passing—very rapidly passing—notice without the something more.

That sort of reporting is all very well for filling the pages of the minute-book, or as an exercise in a style of composition which spreads an infinitely small amount of information over a vast area of paper, but it is hardly up to the requirements of a public journal. If we had been told what the "several novel features" consisted in, and precisely where the "considerable amount of ingenuity" had been displayed, we could have dispensed with the reporter's own opinion, which involves a palpable truism, and judged for ourselves. As it is, we are as well posted up in the "points" of Mr. F. Houghton's changing box as if the Walthamstow Club possessed no reporter.

I know it is extremely difficult sometimes to condense the account of a discussion without spoiling it, and therefore I would let *published* reports consist only of important matter that will bear treating at some length, leaving the catalogue of exhibits and of namby-pamby speeches for the private minute-book of the Society. As an instance of how the too severe curtailment of a discussion may work I would point to a meeting of the Birmingham Photographic Society, at which the question of toning and fixing in one bath was discussed. Mr. Middleton is reported to have said, "Chief objection, sulphur; use a little common salt in the bath." Now, owing to the extreme brevity of the wording, I am quite at a loss to know in what way Mr. Middleton finds the sulphur make itself objectionable; whether it is deposited in the bath or on the prints, or whether the latter become sulphurised at a subsequent period. But there can be little doubt, as the report reads, that salt is a remedy, which I very much question. If the speaker's remarks had been a little more fully given the context would have assisted me, perhaps. Then Mr. Pumphrey is not made very clear as to whether he speaks in favour of the system or not.

"Not used by professionals" would, perhaps, be a recommendation in the eyes of some of our "exclusive" amateurs; so, perhaps, would "costs more" if they happen to possess means as well as exclusiveness; but, "can take straight from printing frames and put into bath" remains unexplained. Mr. Tylar's evidence alone reads intelligibly, and I gather from that that he has used the process with success, and that the prints have stood the test of time so far as he has applied it. But that particular subject would bear much fuller reporting at the present day, when gelatino-chloride, and similar papers, offer a chance of going back to the gold and hypo bath, if its results will stand.

Nothing in connexion with photography has struck me as so forcibly emphasising its rapid spread in a purely scientific direction as the application mentioned by the Chairman, Mr. C. H. Trinks, at one of the meetings of the London and Provincial Photographic Association. The idea of instantaneous photographs in the microscope would have taken away the breath of a photographer of ten years ago, but now, thanks to the rapid progress not only in photographic methods but in other sciences, that, and other feats apparently equally impossible but a short time ago, are now looked upon with comparative unconcern.

I am no advocate of indiscriminate drop-shutter work, considering that the artistic results would be infinitely improved if nine-tenths of the shutters now in use were put behind the fire. But there are, of course, cases where infinitesimally short exposures are absolutely necessary. I can conceive no more interesting application of rapid photography than to the rendering of the contents of the live cage under the microscope. The task, however, is one so surrounded by difficulties that it is not likely to attract a large number of experimentalists; there will, therefore, be all the more credit to be divided amongst the few who may enter the limited field.

I have to thank Mr. Adcock for the pictures duly forwarded to me by the Editors, but they scarcely affect the argument in any way. Making figure studies from selected subjects, who attend by appointment at the artist's studio, is a very different thing from securing picture studies by chance "shots" in the streets. My argument was that the production of *pictures* from materials to be picked up in the London streets is not the easy task Mr. Adcock appeared to deem it; but now that he himself disclaims any idea of exposing haphazard upon anything that presents itself, we find ourselves on the same side of the argument. It is not every photographer, however, who possesses the necessary amount of "pluck," and the feeling of being sufficiently above suspicion to make a practice of enticing "picturesque flower-girls" into "quiet by-streets." Little considerations of this sort combine to prove what I originally said, namely, that street photography is not the easy task it appears on the surface, while the question remains as to whether the results are worth the trouble artistically.

My contention is that such photographs may be technically excellent, may be good and useful studies of grouping, and all that, and as such invaluable to the painter; but that if the painter-artist actually made use of them he would, even though adhering slavishly to the pose and grouping, and what I may term mechanical construction, infuse into the picture a feeling and meaning quite beyond the power of the photographer. The painter, in addition to his technical skill and artistic perception, must be an actor capable of *feeling* the character he desires to depict on his canvas. The photographer must be more; he must not only possess the dramatic perception, but also the power of imparting it to his subject, in order that the latter may assist him in completing his conception. If the subject fail him in this, he is no better than the painter's lay figure, and the photographer's best effort will be as devoid of artistic merit as a rendering of the expressionless block of wood robed in the property finery of the artist's studio.

I do not wish to decry the class of work Mr. Adcock loves, nor to deny to photographers the possible capability for really artistic work. Rather, I desire to show how the photographer is sufficiently handicapped in the race and how to produce artistic work is more difficult, and consequently more meritorious, than in the case of the painter. This brings me back to the starting-point—is it worth the while of the ordinary photographer to adopt so high an aim; to forsake landscape work or "rustic scene hunting," for a class of work in which his chances of attaining even mediocrity are but scant?

Your correspondent, Charles Truscott, in last week's issue stands up for, but scarcely succeeds in defending, his photographic heresies to which I alluded some time ago. I have nothing to say against papers being read for the purpose of provoking discussion, but I do object to such papers taking the form of a string of "distortions" (Mr. Truscott's own expression), and that is what I complain of in his case. Perhaps when Mr. Truscott has lived and learned a few years longer he will discover a few more "heresies;" but if he shall have really learned, he will scarcely again lay himself open to such a well-deserved rap on the knuckles as that applied to him by the Editor last week.

MONITOR.

THE TESTING OF LENSES.*

I HAVE now to describe my method of testing the relative value of lenses for each quality, viz.:—1. Defining power and flatness of field. 2. Astigmatism. 3. Achromatism. 4. Depth of focus. 5. Distortion. For this purpose I use a long table which supports my optical bench. This bench consists, first, of a framework five feet six inches long, with a finely-divided scale running along each side from end to end. Secondly, of two supports capable of being propelled by separate screw niches to any distance required. To one of these supports my ordinary camera is clamped, to the other is a large bellows and focussing screen. This bellows can be fastened on to the rear of the small camera so as to make a large camera of four and a half feet extension, the large focussing screen being twenty-eight inches in diameter, which is sufficient to include the diameter, or half the diameter, of the circle thrown by any ordinary lens used in photography at not less than five times its focal length. On the wall opposite, in a well and evenly lighted position, I place the various test objects in a line with, and at right angles to, the axis of the lens to be tested. By means of a soft composition (chiefly wax and paraffin) used by dentists, I am enabled to fix any lens accurately, and at a moment's notice, to the front of the camera, thus dispensing with the flange. Let us suppose that the camera is in position, and the lens to be tested adjusted, we can proceed to test it as follows for flatness of field:—A cardboard figure is prepared consisting of a number of concentric circles drawn with Indian ink on a white ground, the intervals between each being one millimetre and the lines of similar thickness. For reference, every tenth line starting from the centre is numbered. This figure should now be placed in the axis of the lens, and parallel to the plane of the focussing screen, and the object carefully focussed on the latter. Now, in comparing different lenses these lines should be reduced in the same proportion. For it is clearly easier to compare accurately the definition of two lenses when they are of the same breadth than when they are of different breadths. The thicker a line is, the greater breadth of indistinctness there must be round it for it to appear indistinct. It is clearly easier to compare the qualities of two things when they resemble each other in all qualities outside those in which we compare them. Thus it is easier to observe whether the illuminating power of two sources of light are alike when the light is of the same colour from each than when it is of a different colour. Hence, in comparing different lenses, the lines must be reduced to the same size.

Now, it is necessary for us to contrive a formula to enable us to show at what distance the circles must be placed so as to set the lines the same size in each case:—

Let O be the size of an object, I the size of its image; (a), the distance between the object and the lens; (b), the distance between the image and the lens; (f), the focal length of the lens.

Then: $\frac{1}{b} + \frac{1}{a} = \frac{1}{f}$ i.e., $\frac{1}{b} = \frac{1}{f} - \frac{1}{a}$

$\therefore b = \frac{af}{a-f}$

Again: $\frac{I}{O} = \frac{b}{a} = \frac{af}{a-f}$

If, then, O be the system of circles, or any fraction of that system, and the arrangement be such that the image is *always the same size* for any lens, we must choose a (i.e., the distance of the lens from the object), so that $\frac{f}{a-f}$ is the same for all lenses used.

If we were to place the object several feet away, a would be very much greater than O, and f might be neglected in comparison with a. Hence $\frac{f}{a}$ would be the same for all lenses used, i.e., we should have to

* Concluded from page 761.

view the object at distances from the lens proportional to the focal length. The objection, however, to having a very much greater than f is, that the figure viewed would have to be increased to an enormous size. Hence this simplification is not in general convenient. Practically, it will be found best to choose a about five times the focal length, and as the lines in the image should be only just so large as to be distinctly visible, i.e., $\frac{1}{100}$ inch broad, we should have the breadth

$= \frac{a-f}{f} \times \frac{1}{100}$ inch = $\frac{4}{100}$ inch,

i.e., one millimetre, or, rather, they should be of this order of magnitude, and not less than this.

An objection to this method of comparing lenses will be that a lens has different defining powers, according to the distance of the object viewed. The defining power of the lens ought, therefore, to be taken when viewing an object at a fixed distance. But the objection can easily be removed; for, from the defining power of a lens at any distance, that at any other distance can be calculated. Practically it would be best to choose for the absolute measure of the defining power of the lens the defining power at an infinite distance, and this can be calculated from our observations by means of a "correction for infinity." Now we can show mathematically that this correction for infinity is a

constant, and that it can be represented by the formula $\sqrt{\frac{a}{a-f}}$.

To show how easily it is applied, let us suppose our lens is one of four-inch focus, and that the series of circles is placed at five times the focal length of the lens, then A being distance of the lens from the object, and f being the focal length of the lens, then

$\sqrt{\frac{a}{a-f}} = \sqrt{\frac{5}{4}} = \frac{2.236}{2} = 1.118$

It can be proved that the defining power of a lens

$\sqrt{\frac{a}{a-f}}$

Now, when the lens is used to view an object at an infinite distance,

A = ∞, and $\frac{A}{a-f}$ tends to the limit unity for $\frac{a + \div a}{a-f} = \frac{1}{1-f/a} = 1$ if

a = ∞. Hence the defining power for an infinite distance = defining

power for distance a + $\sqrt{\frac{a-f}{a}}$, and the correction to our observa-

tion for an infinite distance is $\sqrt{\frac{a-f}{a}}$.

Now, let M be the number of millimetres, within which the lines can be distinctly defined, which is the best measure of defining the power of the lens M or $\frac{M}{f}$ or some other function of M? Suppose we have two lenses of different focal length, but whose measure of definition is equal according to the first system. These two lenses will give an equal amount of haziness at equal distances from the centre of the focussing screen. They will take equally clear photographs of the same size of plate, although the shorter focus lens will contain smaller images and more subject matter than the other. Suppose we have two lenses of different focal length, but of equal measure of definition according to the second system. These two lenses will give equal amounts of haziness in the focussing screen at distances from the centre proportional to their focal length. They will, therefore, have equally well defined photographs if the size of the photographs be proportional to their focal length. Now, the size of the photograph is proportional to the distance to which the camera is drawn out, and cameras are usually made similar, i.e., the distance to which the camera can be drawn out is proportional to the general dimensions of the camera. Hence these two lenses will give equally good photographs, provided they are used in cameras whose dimensions are proportional to their focal lengths—i.e., a "quarter-plate lens" will give as good a definition at the edges of a "quarter-plate" focussing screen as a "whole-plate lens" at the edges of a whole-plate screen, if the two lenses are in all other respects equal. A little reflection will convince every one that we must adopt the formula

$\frac{M}{f} \sqrt{\frac{a-f}{A}}$

in preference to the former method, and that is what I adopt, as it is a quantity independent of the unit of length adopted. This method of comparing lenses, as above described, has been in a modified form

adopted by the foreign opticians in testing microscopic objectives, although I believe it has never previously been adopted for photographic purposes. Indeed, Professor Naegeli, in his work on the *Microscope*, says (page 127): "The images of wire gauze are recommended as test objects preferably to all others, because, in the first place, for every range of amplification they present one and the same object, and wire gauze may be substituted for the test circles above described, if any one wishes, although the latter are easier to read off."

2. Measurement of defining power. The defining power of a lens is quite an independent property from the last. In this case the centre of the field must be first chosen (and afterwards other points at variable distances if deemed necessary), and the test circles or squares removed, and in their place a silvered ball or convex mirror of very short radius (one inch to three inches) is substituted. Cowell's test types* are now placed at a definite distance from the ball or mirror (the distance bearing a constant ratio to the radius of curvature of the reflector), and the letters are well illuminated by a lamp, the lamp and the types being so adjusted that the image is seen in the centre of the screen of the camera and in a line with the lens axis. An extremely small image of the type is projected on to the reflector, and the smallest type is noted that can be read off with the eye-piece in mid-air. This is the index of definition for this particular lens. This should be done first with full aperture, and then with all the other stops in turn until the best result is arrived at; by this means we arrive at another result, viz., the penetrating power of the lens. This latter is a different quality from the defining power, and in telescopes and microscopes it is of great importance. To make my meaning clear it is as well to define these two terms. By the term penetrating power we imply the power which a lens has to render clearly and sharply fine details. By the term definition we mean the capacity of exhibiting clearly and distinctly in the image the form and outlines of the object. Thus good penetrating power shows up the markings and striæ of diatoms, and shows up obscure comets and nebulae, and is largely dependent on the size of the aperture or stop used; while good definition will show a clear, sharp marginal outline to the diatoms, or in the telescope will resolve double stars, &c. Herschel, who first applied the term penetrating power, showed that it is dependent on the size of the aperture, not the defining, or outline power, upon the optical perfection of the instrument (Naegeli & Schwendener). I believe that it is due to the combined effect of these two properties which enable the portrait lens to excel every other form of lens in the perfection of the image of a flat surface over a limited area.

Besides these tests, which are the chief ones, it will be necessary to examine for achromatism, depth of focus, and distortion to complete our task. I will not examine them in detail, reserving this for another opportunity. I may say, however, that achromatic aberration is best tested either by the optician's method of examining the colour circles, and the coincidence of the chemical and visual rays (i.e., of the photographically actinic with those rays most visible to the eye on the focussing screen) is best tested by the apparatus described and figured in Monckhoven's *Optics*. This consists of seven pieces of wood inserted in spiral form along a cylinder of wood about two feet long. These are painted black, and each is numbered with a white figure in order from 1 to 7. The cylinder is placed at about five or ten feet from the lens, with its long axis pointing to the centre of the lens. In this way each of the figures is clearly seen. We now focus carefully for the central figure 4, and expose and develop a plate. If this figure is quite sharp, the chemical and visual foci may be said to coincide; if not, according as the lower and higher in figures come out clearest, so the lens is over or under corrected.

To test the depth of focus of a lens, I think the best way is to adjust the camera first of all to infinity—a distant weathercock or chimney will do perfectly to mark the position on the camera front, or the back, if that travels. Then focus for the test squares at five times the focal length of the lens and mark again. The distance which the camera has been racked out (as shown by the two marks) will give us data for calculating the depths of focus.

DR. G. LINDSAY JOHNSON,

DISCUSSION.

Mr. J. Traill Taylor, while admiring the learning displayed by Dr. Lindsay Johnson in his lecture, would have preferred that a somewhat more practical turn had been given to the testing of lenses.

* Cowell's test types are merely an improvement of Professor Snellen's "Schriftproben," in which a number of sentences are printed in types of varying, but definite size, so that the letters of each series subtend an angle of five minutes at a distance of 1, 1½, 2, 2½, 3, 3½ (and so on) metres measured from the observer's eye. They may be had of Harrison, printer, in St. Martin's-lane.

Concerning the method described by the lecturer for ascertaining the focus of a single or landscape lens, viz., measuring the distance between the ground-glass and the nearest surface of the lens, and adding thereto half the thickness of the lens, this could only apply to a lens of double convex form—a class that was never employed in photography. Photographic landscape lenses were either of a plano-convex or meniscus form; and in the case of the former of these, the point from which the focus had to be measured was one practically adjoining the optical centre which was at the convex surface of the lens, while in a meniscus lens the focus was measurable from a point altogether outside of the lens, and which, if the meniscus shape was very pronounced and deep, might be situated some considerable distance outside the convex surface. One of the best and simplest tests for spherical aberration in a combination was to cut a disc of opaque paper the size of the front lens, and in that cut a hole seven-tenths its diameter, measuring the central portion thus removed. Attaching the first portion to the lens, let a photograph be taken of any well-defined object, focussed with the utmost care, and then, having removed this temporary diaphragm, let the piece that was cut from it be affixed to the front lens, and a second photograph be taken without disturbing the camera. Both negatives would be equally illuminated, as the areas of aperture would in both cases be alike. If the second picture were equally sharp with the first one, the lens would be free from spherical aberrations. A watch dial placed at a little distance formed a good test for definition in a lens; while its condition with regard to chromatic aberration might be ascertained from examining an artificial star conveniently made by illuminating a thermometer bulb illuminated by an adjacent lamp.

Mr. Conrad Beck said that opticians had to deal with a great inconvenience in that all optical books in English up to within the last few years in treating of lenses have omitted in their calculations the effect of the thickness of a lens, and the means of correcting for rays traversing it obliquely. The focus should not be measured from the centre of a lens, but should be measured from two "principal planes," which were situated in different positions, according to the formation of the lens. In a biconvex lens they were situated within the lens, each plane being about one-sixth of the total thickness on either side the centre of the lens. In a plano-convex lens one plane was about two-thirds through the lens, the other on the convex surface, while on a meniscus both planes were outside the lens. In a case which he had in his mind of a twenty-four inch focus meniscus landscape lens the planes were situated at a distance from one inch to one and a half inch outside the lens, so that if the focus had been measured from the centre of the lens it would have been about twenty-three inches one side and about twenty-five inches the other. He then mentioned that in a symmetrical these planes were often situated at some distance from each other, and showed that it was not correct to measure from the centre of a symmetrical lens to obtain the focus. He recommended, in order to obtain the equivalent focus, the method that was mentioned by Mr. Traill Taylor in his lecture on lenses. He then stated that the optician had not only in making his lenses to correct them for spherical aberration, but that he had to throw his image on to a flat instead of a spherical plate, and in order to do this certain special corrections became necessary. If the lenses were accurately corrected for one aberration, another correction was often disturbed, and the whole system of correcting photographic lenses was a system of balancing corrections against each other, so that the best final compromise was effected. He then stated that if an amateur examined a mercury bulb in the way that Mr. Taylor suggested, he would find a very different correction to what would be used in a telescope object glass. If a photographic lens were corrected in the same manner as a telescope there would be what is commonly called a chemical focus—that is to say, the rays which do the most work in taking a photograph would not come to the same focus as the visual rays, and a special correction has to be made for this purpose. He concluded by saying he believed the best method for amateurs to test their lenses was by taking photographs with similar lenses and judging of their working qualities on the subjects they were sold to photograph. He stated that in optical tests there were so many points to be considered, that one who had not had an optical training was very apt to be misled.

Mr. Lyonel Clark said it was of course impossible to criticise the learned Doctor's paper, seeing that it was in an unfinished state, but he thought that what were the particular defects and faults inherent to lenses might perhaps have been more fully dealt with by the lecturer. There were five great sources of error in lenses; Monckhoven called them five aberrations. The first was spherical aberration; this form of aberration is caused by the fact that the rays of light falling on the edge of a spherical lens were not refracted to the same point as were those rays which fell on or near the centre of the lens. Now

since the image was formed by the accurate consequence of the several rays of light, of which it was formed to a single point, it naturally followed that when they did not meet it resulted; this was the cause of the so-called depth of focus being greater in one lens than in another. The second aberration is known as chromatic aberration, when the lens refracts the light it also breaks it up into its component colours, and the image is seen surrounded with coloured rings. The third aberration, commonly called roundness of field, was often confounded with spherical aberration, but could easily be distinguished by the fact that with roundness of field by racking the camera in a plane could be found where the marginal definition was improved, whereas when the fault lay at the door of spherical aberration there was no point at which the definition improved. Aberration No. 4, commonly called distortion, was the bending in or out of the marginal lines of any rectilinear object, and was called either barrel or pin-cushion distortion, according to the shape the image took; it was entirely absent in lenses of the symmetrical type. Its cause was easy to see. If a square were cut out of a plano-convex lens, the extreme edges of the square will be of thinner glass than the centre of the sides; so with the rays of light, the corner ones passing through a less thickness of glass than the centre ones, they are differently refracted. Aberration No. 5 is known as astigmatism, and the cause was not quite so easy to see as that of the preceding aberrations. Imagine a cylinder of light falling on the lens obliquely, that is from one side. Now, if a vertical section be taken through this cylinder, the bounding sides will be of equal length, but if a horizontal section be taken they will not be so, but one will be longer than the other. The effect of this was to make one focus for vertical lines and one for horizontal ones, so that in focussing a cross the whole could not be got into sharp focus at once, but either one or the other limb. He believed, however, that this aberration was by no means often met with in modern lenses. In conclusion, he was very pleased to see that Dr. Johnson had taken so much trouble to popularise what had hitherto been considered as beyond the reach of the average amateur.

Captain Abney, in summing up, pointed out one or two errors into which the lecturer had fallen. He also showed that it was easy to obtain parallel rays by the use of a collimator. The whole system of photographic lenses was a matter of compromise, errors being counteracted by errors. Mr. Clark's remarks gave him the greatest cause to blaspheme. His reference to depth of focus was to him like a red rag to a bull. He looked upon it as a matter of aperture. A lens which gave diffusion of focus was a bad lens. Depth of definition could only be obtained by contraction of aperture. He did not like fuzziness, but preferred those lenses which brought infinity rays to a sharp focus in one plane.

Dr. Johnson, in conclusion, thanked the meeting for letting him off so easily. It was needed that some one should strike out some new methods and make a bold stand.

THE ACTION ON THE NEGATIVE FILM OF METHYLATED SPIRIT AND HYPOSULPHITE OF SODA.

So far as I am aware spirit has been recommended only as a means to be used to dry the film quickly after fixing; but I believe it is a "clearer," safer, if not better, than hydrochloric acid or alum. The mode of action of the methylated spirit appears to be by mechanically contracting the pores of the film, thus forcing out with the water something more from the "deeps" of the film than the hypo has removed. It will be found after the spirit has been used for some few plates, as with care it safely may, and it be allowed to settle for about twelve hours, there is a light, white substance precipitated in the bottle. It can be filtered out almost entirely by cotton-wool well pushed into the neck of the funnel, and, I think, removed entirely if about half an inch of powdered animal charcoal is superadded to the cotton-wool. (I find it better to filter the spirit after every day of using. It takes time, but as it can be done by setting it to filter during the night, there is really no loss of time.) If not filtered, the above mentioned substance, invisible when diffused through the bulk of the spirit, appears to be caught by the plate, and markings result, which are reproduced in the printing. If the spirit is kept rocking the substance is much less liable to deposit on the plate, and the advantage of getting the plate dry more quickly is but slightly diminished if it be rinsed under a tap after being in the spirit and before being set up to dry. Of course the spirit alters in specific gravity by continuous use, particularly as the best effects are produced when the plate is put into the spirit directly after it is thoroughly drained, and not later. Then a longer time must be allowed than when using fresh spirit. If put in when surface dry, *i.e.*, just as it is beginning to show dryness at the edges, the action of the

spirit is not only not so satisfactory, but may produce markings, the cause of which I will not go into now.

But what is the deposit in the spirit? It appears to be some of the unchanged chlorides, &c., that the hypo and the after washing has failed to remove. The plate will remain unchanged if no "clearer" is used.

What does the hypo do? I do not recollect to have read any definition of its course of action, beyond that of "dissolving out," but is there not some chemical action that takes away the sensitiveness? and the deposit in the spirit is probably identical with that in the hypo. I doubt if any amount of washing and soaking will remove this so well as the contractive action due to the use of spirit, which, as I have suggested, is simply mechanical, and not open to the objection that the other "clearers" are open to, of a possibly chemical action, more or less, at one time or another on the plate that may be deleterious.

HYDROKINONE.

This chemical, I have lately found, appears, as Mrs. Malaprop would say, as "Two gentlemen at once," for you may buy it with either of the two following characteristics:—(1), As a colourless, or nearly colourless substance, crystals very small and rather inclined to mass together, and inodorous; or, (2), as amber coloured crystals, long and large as compared with No. 1, and peculiarly scented. The former is rather the more powerful for photographic purposes than the other, and generally I prefer it. I saw in the *JOURNAL* of November 25, a professor in America had said the hydrokinone developer *need not* be rocked, but from my late experience, confirmed by another opinion, it *ought not* to be rocked. I had noticed the middle of some of my plates wanting in density, just where the dead point would come if not rocked very slowly and carefully, and at first I could not account for it, thinking it was some reflection from the lens, and I also noticed that when I had left the plate still directly the image had shown itself, or rather shown signs of appearing, much greater density has been the result.

W. T. F. M. INGALL.

SPOTS, STAINS, AND FADING.

[A Communication to the London and Provincial Photographic Association.]

SOME years ago, at a country Literary and Scientific Society, one of the members promised a paper on *The Spots on the Sun*. The evening came; there was a large attendance, and the subject was evidently of deep interest.

When called upon to read the paper, the gentleman who had promised rose and said:—"Mr. Chairman and Gentlemen, we are met together this evening to endeavour to elucidate something which has for ages puzzled many of our most scientific men. It is evidently a matter in which we all take a deep interest, and that is why I promised to bring forward a paper on the subject to-night." He then took a small slip of foolscap from his pocket, and read the following question:—"What do the spots on the face of the sun consist of, and are they permanent or transitory?" After expressing a hope that the discussion would be of much practical value, he bowed and sat down.

Now, gentlemen, that is exactly the course I should have liked to have taken to-night; for my sole object in saying I would give a short paper was to reopen the discussion we began on the 17th ult. In reintroducing the subject, however, I do not propose to confine my attention to spots only, although I believe spots, and spots only, has been a subject of special interest lately; but I should also like to include stain marks, fading, or, in fact, anything tending to spoil the beautiful, though much maligned, silver print, more especially after it has left our hands in a mounted condition. It is, I think, generally admitted, that mounted prints are far more likely to fade than unmounted ones; and I think we may also take it, that marks which appear in unmounted prints usually make their appearance during the course of their preparation.

Of course there are certain spots and stains familiar to us all—spots from dust between negative and paper, stains from hypo on untuned prints, and numbers of similar evils which are due solely to carelessness. We recognise these at once, grumble at the printer, and think no more about it, knowing that a few wasted prints, and possibly a few days' delay, will end the trouble. Occasionally, however, we come across spots and stains, the origin of which we are at a loss to discover. An instance of this kind occurred to me not long ago, and I much regret now having destroyed the prints. For some months, at varying intervals, a few of the prints would be marked with yellow stains, sometimes circular, sometimes comet-shaped, sometimes of no describable shape. The marks usually came after fixing and while in the washing water; they did not appear to have any centre, and were of various sizes, from a pin's-head to a sixpence. I tried to account for them in various ways, and failed; there was no alternative but to

go on as usual, and it is some time since the enemy appeared. On the last occasion it took a very mild form, and had the appearance somewhat of mildew: this I can show you.

To me, however, the most annoying of the "ills" to which photographic "flesh is heir," is when you have made your prints with all the care of which you are capable, mounted them accurately, finished them and sent them home, feeling, probably, a satisfaction in the result, there may be some demon in the mounting board, of the existence of which you are perfectly ignorant; and while you are hugging yourself in the belief that your pictures are as permanent as they can be made—for, alas! with all silver prints it is only a question of time and circumstances—there may be stealing over them spots and stains, to the great damage of your reputation and the great annoyance of your customers, to whom you thought you had done your duty in that state of life to which, as a photographer, you had been called.

It is sometimes difficult to tell who is the actual offender—the printer or the maker of the mounting boards. I am of course supposing, as I said before, that every care has been taken with the prints, that they have been well toned, thoroughly fixed and washed, and mounted with fresh starch—and here we must pause a minute: there is starch and starch. When good it is the best mountant that can be used for general work, but it is sometimes adulterated with something—and what the *something* is I am not quite sure—which causes spots, often attributed to other causes; and here I would recommend my brother photographers to buy the best white starch, and buy it in the packet as it comes from the manufacturers. Many oil and colourmen keep starch, chloride of lime, and several other equally useful articles in adjoining drawers, and they are not at all conservative in the way of scoops. A little chloride of lime, for instance, might be no disadvantage when the starch is to be used for laundry work, but would scarcely be desirable when required for photographic purposes.

To resume. I am supposing the fault *not* to be due to the mountant, but the mounts, or something which has accidentally or ignorantly been allowed to come into contact with them. I am inclined to think that, in some instances, printers do not take sufficient care when printing in bronze. Of course, if people will use mounts so printed, he must print them; but he need not necessarily allow the powder to be blown "all over the shop," and so spoil the mounts of those of his customers who do not wish their boards covered with particles of tin and copper.

I remember on one occasion being in the printing department of a large photographic warehouse, and taking a cabinet mount from a pile printed in bronze; passing my hand over the back, there came off enough powder certainly to do two or three more, and yet these were all cut and laying back to face ready to be packed up and sent home.

I have heard of people saying bronze powder will not cause fading, and that experiments have been made to bring about such a thing and failed; very likely. It is very easy sometimes to fail where you most expect to succeed, and to succeed where it would be a distinct advantage to fail. An instance of this occurred with myself only to-day. About two years ago I had a lot of large pictures to print in platinum; the weather was humid, and I was short of indiarubber cloth. It was inconvenient to get some near home, so I sent for some material such as is used for table covers. The platinum prints finished, the American cloth was left in the frames, and in due course these frames were used for silver printing. Wherever this cloth touched the silver paper, and even when a piece of blotting paper was between them, a deep brown stain was the result. Wishing to show this to-night, I attempted to bring about the same result to-day. Whether the cloth has lost that peculiar property it once possessed I cannot say, but there is the cloth, and there are the prints, and nothing whatever is the matter with them.

Now I cannot say I have had any personal experience with bronze printed mounts; I have always looked upon them as a possible source of injury, and avoided them accordingly. My greatest annoyance (for which the printer or card-maker is responsible) is in connexion with *enamelled mounts*. That all enamelled mounts cause fading or injury I am not in a position to say; in fact, I show you here some pictures so mounted which have been in a show-case for years, and whatever fading there is, is certainly not due to the mounts: they were printed in 1874.

The first case I remember of spots being caused by enamelled mounts occurred in 1874-5. I had a model to photograph, and the mounts were to be white enamelled like the pattern sent. I obtained some of the best quality cards, and having a few left after the order was completed, used them for other purposes. All the pictures mounted on these cards were covered with spots. Here is a specimen. It will be noted that the mounts have a bronze line round them. I have always, however, considered the spots due to something in the white enamel and not to superfluous bronze powder. The next batch

of enamelled cards I have to complain about caused not spots but fading. This was in 1878. They were of a buff colour, and all the prints I can find that were mounted on these have faded considerably. That you may see this is due to the mounts and not any alteration in my mode of working, I here show you some pictures on plain greenish mounts I was using at the same time; all the pictures on these are as fresh as the day they were made, or nearly so. I need scarcely say that although these pictures have been done nearly ten years, it is not a pleasant thing to reflect that, at any rate, there must be 5000 *cartes* bearing my name in this unsatisfactory condition, and through no fault of mine.

Now I am not sufficiently acquainted with the various substances used in the manufacture of cardboard to say what particular compound is most likely to have caused the result I have mentioned; but no doubt many of our better-informed members may be able to throw some light on the subject. I would also say that, in common with most of us, I have, in turning over old photographs, frequently found *faded* photographs on plain mounts. From my own experience, however, I have found those that have been enamelled the most untrustworthy, and it is my intention to avoid them in future.

One more example of marks due to enamelled mounts, and I will not further occupy your time.

Here is a *carte-de-visite* that has been printed perhaps two years. You will notice what appears to be brush marks on the face, and that it has faded in streaks. This, of course, might be due to an acid mountant. It is not so, of that I am certain, and if you will turn it over you will see similar marks on the back of the card; and not only that, but even a dark mark where it has been in contact with the little brass strut produced. What is the cause of this I am unable to say; but I hope the discussion to follow will be the means of clearing up some of these points.

In conclusion, I may say that it is now my practice to avoid (for silver prints) enamelled mounts of all kinds, and to use as far as possible only plain toned mounts of good quality; these I have found the most reliable and the least likely to cause either spots, stains, or fading.

F. A. BRIDGE.

REMOVING GELATINE FILMS FROM THEIR GLASS SUPPORT, AND CONVERSION OF AN ORDINARY NEGATIVE INTO A FILM NEGATIVE.

[A Communication to the Glasgow Photographic Association.]

I wish to bring under your notice this evening not only a very simple method of stripping a gelatine film from its glass support, which does not seem to be so well known as perhaps it should be, but also further demonstrate the possibility of converting the ordinary gelatine negative into the film form of negative. Every one knows how tenaciously the dry plate film clings to its glass support. Quite recently a manufacturer of dry plates, who had a stock of fogged plates, and who desired to recover the emulsion, mentioned to me the difficulty he had experienced in getting the film scraped off; in fact, they were about beat with it, and, as you can imagine, a scraping process, as far as the glass was concerned, was certainly not to be recommended. I suggested the use of a weak solution of hydrofluoric acid, and so effective is such a solution that I thought it might interest the members to bring it before them in a practical form this evening. Here are some old negatives varnished and unvarnished, and I will immerse them for a short time in the solution, and you will see with what result. In a very short time you have the complete film detached, longer of necessity in the case of those negatives which have been varnished, as the solution in this case, owing to the protecting layer of varnish, does not penetrate so quickly to the glass surface. The strength of the solution is a matter of no great exactitude, perhaps ten ounces of water and half an ounce of ordinary commercial hydrofluoric acid. A stronger solution might operate quicker, but as every one knows the substance we are dealing with is in the strong form employed to etch glass; a weak solution, although it may take longer, would certainly be preferable where the glass might be wanted to be used over again.

I think you will see that the glass from which the films have been removed has not been attacked in any way, and one recommendation may certainly be put forward that after being washed it may be considered as chemically clean. I perhaps should mention that as the solution even in the weak form is a highly deleterious one the fingers should not be immersed in the solution. In making the experiments for this night's communication I was somewhat careless regarding this matter myself, and for a couple of days afterwards I was reminded of the fact by a severe pain under each nail of the fingers which had been immersed in the liquid.

Now, gentlemen, having got the film off, and that in a perfect form,

it has for a long time appeared to me that here we had a veritable film negative, and that only two things were wanted to make the thing complete, namely, to prevent the expansion of the film, for you will see in the films which have been removed that a considerable extension both in breadth and length has taken place, and, further, to so increase the thickness of the film that a certain amount of stability should be imparted to it. To illustrate what I mean here is a half-plate film removed from the glass support according to the method described, and allowed to dry on a vulcanite board; you will see that it is now very much larger than the true half-plate, and that although it certainly could be used in the printing frame and give perfect results still it is rather a fragile negative. Now in the gelatine skins we have been hearing so much about to-night in connexion with Mr. Armstrong's demonstration, have we not the very thing that will enable us to turn to account the films stripped by the method now put forward? Here is such a film negative, and I beg now to show you how such has been obtained. Having immersed the skin for a minute in the soaking solution, and transferred it to the tray where the film that has been removed is floating, it will be found quite possible to bring the two out together in close contact. A vulcanite sheet being at hand they are placed upon it, and by means of water made to be perfectly flat. Air bells can be driven out by gentle application of blotting paper, and when no more of these are seen the whole can be allowed to dry, when it is a very easy matter indeed to pull off the film negative. Regarding the prevention of the film's expansion, I think this may be arrived at by means of alcohol. By means of this reagent we are not complicating matters. By the introduction of a salt into the film, as we would were we employing a solution of alum with alcohol, a subsequent washing is dispensed with.

As far as my experiments go, the proper strength to use is a solution made up half of methylated spirit and half of water. Undiluted methylated spirit has far too energetic a reaction, contracting the film most unconscionably. The soaking in the spirit may be done in the same tray in which the detaching operation has been performed, the hydrofluoric solution being gently poured off. And it is as well to leave the original plate in the tray, so that when the alcohol has reduced the dimensions of the film we may readily see when it has been brought back again to its original size when on the glass. At this stage, or perhaps shortly before, the skin should be immersed in the soaking solution recommended by the Eastman Company:—

Ammonia	¼ ounce.
Glycerine	½ "
Water	64 ounces.

The skin is then, as already indicated, laid down on the top of the film and the two lifted out together. The vulcanite sheet being at hand, or, what answers as well, a ferrotype plate, the double films are placed thereon—perhaps it is the better arrangement to have the skin next the vulcanite. As the alcohol evaporates and leaves the gelatine, by means of a camel-hair brush any inequalities can be adjusted, and it will be found by a very little care that the two films will be perfectly flat and in close contact. Notwithstanding the very thin nature of the uppermost film, it can stand a good deal of pulling about. You will see that this is the case when we come to the actual demonstration.

I do not think much more remains to be said. It must be understood that I do not put forward this converting of an ordinary negative into a film negative as a perfect process, but I think you will admit that having once got the film off the glass in the very perfect manner obtainable by means of hydrofluoric acid, the possibility of still retaining that negative in the film form is not far removed. Again, take the case of a cracked negative where the film, notwithstanding the crack in the glass, still remains good, such a negative need not be thrown away, for, by following out the lines here indicated, it can be made to do duty over and over again.

For the introduction of these gelatine skins in a commercial form I think the best thanks of those interested in photography are due to the Eastman Company. I should, perhaps, just remark before closing this communication, that the skin used for a particular size of negative should be of a size larger than the actual negative we are dealing with; for example, in the case of a whole-plate negative I would recommend a skin 10 × 8, this enables one to have more latitude in adjusting the two films and saves a good deal of time. The surplus margin of the skin can very easily be cut off when dry.

WILLIAM LANG, JUN., F.C.S.

PHOTOGRAPHING BY THE FLASHING MAGNESIUM LIGHT.

[A Communication to the Glasgow Photographic Association.]

It was originally intended that my paper and demonstration to-night should treat merely of Eastman's stripping films, but at the end of

last week my kind friend, Mr. Reid, threw out a suggestion which at once impressed me as a good one, viz., that, conjointly, we might on this occasion, with the aid of artificial light, expose a few Eastman strippers, and then develop, strip, and skin them in your presence. To enable us to do this, we have received at the hands of Mr. Mason much kind assistance in providing the necessary accessories to enable us to carry this into effect. I should have much preferred, had I been able, to expose a few films outside and show the development and after treatment of such, but you are aware the weather has been so bad lately that such was not possible.

Quite recently the taking of pictures by artificial light without the aid of elaborate and costly accessories has received fresh impetus, chiefly through the revival of what is really not a new mode of making exposures, for so far back as November, 1865, I find that almost identically the same ingredients were then in use and recommended by Mr. Traill Taylor as we find now trotted out as quite new, and which, I understand, has been attempted to form into patents.

In November, 1865, Mr. Traill Taylor recommended a mixture of sulphide of antimony, chlorate of potash, sulphur, and magnesium filings, and, if I am not mistaken, this is practically the same compound as we hear so much made of by Dr. W. H. Vogel, who designates it "the latest novelty in Germany," attributing its discovery to Messrs. Gädicke and Miethé. This compound, after all, is not so desirable as it would at first appear, for it is undoubtedly of most explosive character, being easily exploded by friction or a blow; then, again, another objection arises, and that is the character of the fumes given off from the mixture—the sulphide of antimony when burnt gives off sulphurous gases, and also fumes of antimony oxide, the latter being poisonous. More recently it has been suggested to use, instead of sulphide of antimony, a substitute in the shape of powdered sugar; but when such is employed a very black smoke is given off, which is undesirable.

Very recently there was exhibited before the Society of Amateur Photographers of New York, by Dr. H. G. Piffard, a mixture of guncotton and magnesium powder, and much success has attended its use. I show you a picture which forms the frontispiece of *Anthony's Bulletin*, under date November 12, 1887. This is an instantaneous photograph at night by Geo. G. Rockwood, and was taken by means of Dr. Piffard's magnesium flash light. You can form your opinion, gentlemen, as to the excellence of this production.

Within the last few days my friend, Mr. Reid, and myself have been experimenting somewhat with this flash light. At first we met with some little difficulties, but to-night we hope to show you that a fairly good negative is obtainable by the use of magnesium powder being burnt in conjunction with a few inches of magnesium ribbon.

Our first experiment was with cotton and powder alone, in the proportion of eight grains of cotton to fifteen grains magnesium powder. This yielded a somewhat under-exposed plate; but it is only fair to state it was our first attempt, and it is just possible the light was placed at too great a distance from our sitter. Approaching nearer to the sitter and using a somewhat more powerful light we obtained a fully exposed negative, but with this drawback, that there was a much too even illumination of the face—there being a lack of contrast in high lights and shadows; this might easily be the result of not throwing the light on our sitter from a proper angle or height, but we found this not so easy to overcome, through having to burn the light on an iron receiver, which tends to throw a cast shadow downwards. To enable us to overcome this difficulty, we thought upon the plan of burning a few inches of magnesium ribbon for just a few seconds before igniting the cotton, and in this we partly overcame the difficulty. The ribbon can be so held as to throw a powerful light on the prominent features of the face, and so bring up contrast between high lights and shadows. To do this we had the use of a very neat little magnesium lamp, which I now show you. You will observe the old-fashioned bright metal reflector has been removed, and in its place is substituted an opal glass reflector, which gives a much softer and more diffused light, just the very thing wanted. This lamp goes by clock-work, and once lighted runs on, as a rule, right merrily, giving a very certain and steady supply of ribbon. I hope it will behave itself later on, gentlemen, when we come to operate. Should it not, it will be the fault of the ribbon not the lamp.

Notwithstanding the success which attended our experiments with guncotton and magnesium powder, we were forcibly struck when using such with the yellow nature of the light emitted from the cotton, which in part measure neutralised the very actinic light of the magnesium powder, and we were therefore convinced that guncotton was not the best agent to employ. Our experiments clearly demonstrated to us that in the powder alone lay all that was required, so far as the light was concerned, and it resolved itself into a question of how best to use the powder. At first I tried several other means,

among which was dusting the powder through a homely pepper-box on to a sheet of gauze made red-hot over a Fletcher burner, and here I found I was on the right track in so far as the brilliant light obtained was concerned. But then we had to overcome the difficulty of the cast shadow downwards, and the trouble of placing the light sufficiently high to throw the rays about an angle of forty-five degrees. We then, luckily, tried what a bottle of this description would do, and on using same were overjoyed to find the problem settled. With this cooling bottle containing a quantity of magnesium powder and an elastic tube attached to the ingress pipe, the least puff sent out a spray of the powder, which immediately ignites on any suitable medium for combustion. On blowing a spray of the powder through an ordinary gas flame from any common burner a most brilliant flash is obtained, far and away beyond the gun-cotton light, and this also enables us to direct our light from a suitable angle. When experimenting with this flash light last night I found that when flashed about six feet from the sitter the light was so penetrating as to considerably over expose the film, and so I had to place a gauze screen between the light and the sitter. This done, I obtained a nice negative, and it will be on these lines that I shall proceed to-night. Just a word about this wash bottle. It may appear to some that a considerable quantity of the magnesium powder is forced through the gas flame without ignition, and therefore a considerable loss in material; at first I was of the same opinion, but on closely observing the matter I found such was not the case, and that one short, quick puff did really not eject more than about twelve grains of the powder. I consider the blowing through a gas flame of this powder a great stride in the right direction in the class of work we are considering to-night, especially as it solves the difficulty of being able to throw the light from any desired angle, which is easily done by a common movable gas bracket with universal joints. I am sorry we have not one of such fitted in the room to-night, but I hope to succeed without its aid.

And now, gentlemen, having given you an outline of what we consider the best flash light to use, I will be as brief as possible in referring to the strippers. Any one reading the printed instructions for the working of Eastman films very likely will at once conclude that there is a deal more bother in the working of them than with a glass plate. At first, I must say, such was the impression I formed; but, somehow or other, when you come to work them this does not appear to be the case, and now I am so fond of these films that I shall discontinue plates for outside work in future. In my roll holder I carry sufficient films for forty-eight exposures, and this will at once strike you as a great advantage; the weight of this roll holder, when fully charged with a fresh spool, does not weigh so much as one of my double backs with two plates—fancy the benefit here also. Then, again, no breakage, no space occupied in storing away glass plates, with the accumulation of dust and dirt. The films go into any ordinary book, between the pages, and can be indexed up like an invoice; the development is just as easy, the washing not so tedious—half an hour being amply sufficient in running water—no varnishing. Against all these advantages what have we to set off as extra work?—the collodionising of a plate, a very simple and easy matter, the laying of the film down on same, and, after drying, placing same under the hot-water tap till the paper support peels off, then squeegee a skin on the negative, and the thing is done. The result being a negative capable of being printed upon from either side, a matter in itself of so much importance to carbon workers as to make them almost bless the day they were invented. I have found these films very uniform in quality, of a great rapidity, much the same in this respect as Paget's sixty, and for outside work can recommend them. And now, gentlemen, as we go along I shall be glad to offer any explanation that may be desired.

T. N. ARMSTRONG.

THE LONDON STEREOSCOPIC COMPANY'S EXHIBITION.

THE Third Annual Amateur Exhibition of this Company is now open in one of the rooms of their premises at 108 and 110, Regent-street, London, and contains much work of a high type of excellence.

A first glance round among the frames, of which there are eighty-one, is suggestive of Artemus Ward's army, in which every man was an officer; for we fail to discover one that does not bear the insignia of "Gold Medal," "Silver Medal," "Bronze Medal," "Highly Commended," or, more tangible still, "£10" and "£5." This system of giving one or more awards to every exhibitor—for several exhibit in more than one of the fourteen classes—cannot fail to tell favourably on the future exhibitions of this Company.

Some of the pictures have a familiar appearance, as if we had made their acquaintance at other exhibitions; but as a good story is not the worse for being twice told, so neither is a good photograph the worse for being shown at every exhibition in the world, but, on the contrary,

all the better; and if it be the gainer of a medal, wherever exhibited, why not?

Mrs. Edward Penton leads the list with a frame of three views, two being of windows of Tintern Abbey. Harry Tolley exhibits several of his undoubtedly excellent works, some, if not all, of which are already familiar to many of our readers. A series of fishing boats and other subjects taken in the Shetland Isles by John Leisk, afford a glimpse of life in regions considered almost hyperborean. A frame of yachts and other ships by Captain C. M. Harrison, each picture excellent in itself, suggest how desirable it would be if photographers, when mounting subjects of this class, with well defined horizon lines alongside of each other, would try and have the horizon of all in one row as nearly as possible in a straight line. Captain Harrison is not alone in this, for in his immediate vicinity the same anomaly prevails in Surgeon F. M. Puddicombe's views of torpedo boats and others.

In a frame of four views, *Yachting on Windermere* by W. Gaddum, one is rather spoilt by being too abruptly vignettted. So many otherwise good pictures are injured by sudden vignetting, that it is a wonder photographers do not exercise more taste in this direction. If a negative will not print out to the margin there is no reason why a clean cut oval mask cannot be employed, failing the far more beautiful easy gradation of the subject into nothingness. Surgeon-Major Mantell's photographs of *Clifton Suspension Bridge* and *Rime on Trees*, and J. E. Dumont's *His Own Barber*, are a good deal above the average. H. J. Kennard has a frame of views of glaciers and other mountainous subjects possessing much merit, and *Seven Animal Studies* by Lieutenant Croft deserve special attention. Two of Dr. Alabone's views of jumpers "Going" and "Gone" are slightly marred by the evident knowledge of all the party that they are being photographed, and the consequent staring at the camera. Edward Pritchard shows a series of charming little landscapes, all the more commendable from his exhibiting in a class which shows that he is not yet one year old in photography.

It is an axiom with artists that no straight vertical line, or anything else, should be allowed to interfere with the head of a portrait. This has been overlooked by Miss Joyce Croft in her picture, *The Skipper*, whose figure is perpetuated, as it were, by his being posed against a strongly pronounced central bar of a window. Miss Miles, too, has allowed a flower or shrub to appear as if growing out of the head of her *Duchess of Richelieu*. With more experience and a knowledge of art canons these exhibitors will do better another time. D. R. Clark's *Filling the Water Cart*, and others, have a pleasing engraving-like appearance. The *Fabiola* of J. E. Dumont, in which there is a face visible with a body or figure so shrouded in darkness as not to be seen unless by close scrutiny, is suggestive of some of the faces to be occasionally seen at spirit *séances*, produced one can only guess how. If *Four Figure Studies* by A. Clark could have been in some measure isolated from their backgrounds a great improvement would have been effected. As it is, the backgrounds are so very sharp and pronounced as to distract attention from the figures.

We shall resume this subject next week, and meanwhile recommend such of our readers as can make it convenient to look in and see this exhibition, which is now open, free, to the public.

PHOTOGRAPHY IN COURT.

BULL, BEVAN, & CO., LIMITED, v. THE PHOTOGRAPHIC AND CHEMICAL APPARATUS COMPANY, LIMITED.

In the Court of Queen's Bench, on Tuesday, before Mr. Justice Denman, the above case was tried, Mr. C. Plumtre being counsel for the plaintiffs and Mr. Crump, Q.C., for the defendants.

Mr. Plumtre explained that the action was brought for the enforcement of an agreement to give a bill of exchange for 150*l.*, for damages in the alternative. In October, 1886, a Mr. J. M. Copeland, for whom the plaintiffs had acted as agents, was indebted to them in the sum of 145*l.* 10*s.* 9*d.* Not being able to get payment of the amount, an action was commenced, whereupon J. M. Copeland swore by affidavit that the signatures to certain bills of exchange held by the plaintiffs were neither his nor his partner's. The plaintiffs then laid an information before the magistrate at Bow-street for perjury and a summons was granted. On the return of the summons, counsel appeared for Copeland, and after a formal hearing the proceedings were adjourned. Shortly after the parties met, when Copeland assured the plaintiff of his innocence and ascribed the denial of his signature to a pure mistake, stating at the same time that he was quite prepared to pay them. They in their turn said they had no vindictive feeling against him, and that if he could satisfy the magistrate that he was innocent they would be satisfied if they got their money. At that time a further bill of 42*l.* had become due, and altogether the sum of 250*l.* was admitted to be due by Copeland, who expressed his readiness to pay them 50*l.* for costs incurred in the matter and to give acceptance for 250*l.*, mentioning that his business was being converted into a company,

who would take up his acceptances and make them debtors, and that he would further secure them by depositing certain photographic lenses of the value as he represented of 237*l.* by way of collateral security. In December, Copeland's business was changed to that of a company, called Copeland & Co., Limited, and now the defendant Company, the change having taken place since the action was brought. On December 15th an acceptance was signed by Copeland himself for 100*l.*, and on the 20th another one for 150*l.*, which he promised would be exchanged for one of the present Company's when it was formed. On the 6th January, 1887, the bill for 100*l.* became due, and then one Phillip Mordaunt appeared on the scene, he being one of the directors of the Company. He paid the plaintiffs the 100*l.* due; and a day or two afterwards Mordaunt said that if they would stay proceedings in both the action and the prosecution, and hand over to him the lenses and the dishonoured acceptances, they—the defendant Company—would give them a bill for 150*l.* and a cheque for 50*l.* for costs. On the 10th January the agreement was carried out so far as was possible then, viz., by Copeland & Co. backing J. M. Copeland's bill for 150*l.* and altering it into their acceptance by adding the word "fifty" and by Mordaunt and one of the directors signing it, when plaintiffs gave up the lenses and the dishonoured acceptance. Then on the 15th January, after the matter had been before Mr. Vaughan, the magistrate, on a good many occasions, and on the plaintiffs' manager telling the magistrate he had inquired into the whole matter, and it appeared that Copeland had not seen the acceptances when he swore that the signatures were not his and that it was clearly a mistake of memory as regards books and accounts, the magistrate allowed the proceedings to be withdrawn.

Mr. Crump, in reply to his lordship, said that he would admit all the facts with regard to the acceptances, but not as to the conversation which took place before the magistrate. The plea in the present action was one of illegal contract.

Mr. Plumtre, resuming, said that on the 16th February they were told by Mordaunt for the first time that the lenses were not of the value they represented, but they did not represent their value at all, simply mentioning the value that was put upon them by Mr. Copeland. Upon that ground the defendants said they would not pay the bills when they became due, also objecting that the proceedings in the police court were not stopped earlier. The action was then commenced, when the defendants set up the defence already mentioned, and also a further defence which he ventured to describe as a very shabby one, viz., that the bill having been altered in the way he had mentioned it was invalid under the statute.

Mr. Justice Denman: What was set up in defence before?

Mr. Plumtre: Want of consideration. Then in this action for the first time they set up the defence of illegality, having got the plaintiffs' lenses and their dishonoured acceptances. The whole question for the court to decide was whether there had been a compounding of a misdemeanour so as to preclude the plaintiffs from recovering.

Mr. Alfred Bull, managing director of the plaintiff Company, was then called, and gave evidence in confirmation of the facts stated by the learned counsel, adding, in the course of examination, that Copeland went to him while the criminal proceedings were pending and said that the reason he swore the bills were not in his handwriting was that he was under the impression, not having seen the bills, they were signed by a man of the name of Lofthouse. Lofthouse was assumed to be his partner, but in one of his affidavits he said that Lofthouse was not his partner, but Mrs. Lofthouse was, and witness had never yet found out whether Lofthouse was his partner or not. Copeland also told him that he thought he was quite justified, believing no such bills to be in existence, in swearing that he never accepted them. Witness told him that he had no vindictive feelings towards him, and if he could satisfy his solicitors as to his *bona-fides* he would take him on to them there and then. He did so; and Copeland, on the bills being shown to him, said, "I can assure you I had no knowledge that my name was on these bills in my own handwriting;" and he then said, "I will undertake to assure the magistrate, owing to the bad state in which the books were kept, that I am perfectly innocent of such a charge." Witness got his assurance to that effect, and the necessary arrangement was made.

Mr. Justice Denman.—You got his assurance to that effect of what?

The Witness.—That he would pay us the money that he owed us and clear himself at the police court. That really was the end of the arrangement. He mentioned that his present firm were starting a company and they would espouse the debt. The bills were to be 100*l.* at one month, 150*l.* at three months, and 50*l.* was the agreed amount of the costs, and he gave as collateral security eight or nine lenses which he valued at about 230*l.* The 100*l.* was met by Mordaunt (as described).

In cross-examination by Mr. Crump, the witness said his firm had done business with Mr. Copeland for about twelve months before they knew anything of defendant Company. Copeland had supplied plaintiffs with goods, so that they were his debtors. But it happened also that he became their debtor because they supplied him with money to start a shop in the City for the sale of photographic goods. They agreed to lend him between 150*l.* and 200*l.*, for which he gave bills, and it was these bills which he said the Company would take up when it was formed. There were four or five bills altogether, some of which were renewals. He admitted having told Mr. Mordaunt that the liability on one or two bills was for stock in the business the Company were taking over, and did not think it likely they would have undertaken the liability if it had been an accommodation bill simply for Mr. Copeland; and he told Mr.

Mordaunt that Copeland valued the lenses at 250*l.*, and that Mr. Hunt also corroborated that value. Witness could not say how any mistakes in bookkeeping, or any defect in bookkeeping, could induce a man to repudiate his signature to a bill of exchange, but the mistake arose from the fact that no proper record was kept.

Mr. Ernest L. Bennett, a director of the plaintiff Company, was also examined, and gave as an explanation of the forgetfulness of Copeland in regard to his signature that he heard and believed that Copeland was frequently under the influence of drugs or liquor, and scarcely knew what he was about.

Mr. Crump for the defence said he had a few remarks to make before he called his witnesses, whereupon a long argument took place between his lordship and the two learned counsel on the legal aspect of the case, after which Mr. Justice Denman delivered judgment, remarking that the court would not grant specific performance of a contract unless it saw very clearly indeed that it was a straightforward thing to enforce. It was stronger than if there was a bill of exchange given or anything of that sort. Even if it were an action on a bill given for that consideration it would be a bad consideration, and an illegal transaction. The defendants in the month of January, in consideration of the plaintiffs agreeing to withdraw with the consent of the magistrate from certain criminal proceedings against Copeland, and also on their delivering up certain dishonoured acceptances with certain other goods, agreed to give them a valid acceptance for 150*l.* The plaintiffs now asked for the specific enforcement of that agreement and the payment of that bill, which they said ought to have been given with interest. Now the only words in the statement of claim giving a colour to the argument were the words "with the consent of the magistrate." He thought the case which had been cited showed, upon the authority of Mr. Justice Stephen and Mr. Justice Cave, sitting in bankruptcy, that it would be a bad consideration, notwithstanding the consent of the magistrate, and he could not find that in any of the cases there was any distinction drawn between cases where the thing was launched before the magistrate, and cases where a magistrate had actually committed. The present case was one in which that very distinction existed, and the magistrate would be much more in the dark. After he had committed he knew generally the worst of the matter, but before he had committed, when the thing was before him, so that he might adjourn the case from time to time, there was a greater opportunity of the parties hoodwinking him, keeping him in the dark, so that he might find it impossible on his own authority to get at the real truth of the case. The case, therefore, was one in which the mischief would be greater than in the other case. It was enough to say that there was no such distinction in the law as was sought to be made out, and he must, therefore, entirely refuse to grant any specific preference; so the action must be dismissed with costs.

Our Editorial Table.

THE "PERFECT" PHOTOMETER.

THE London Stereoscopic and Photographic Company have just brought out a very pretty little instrument bearing the above name. It consists of a metal disc perforated with holes, which are covered by a translucent substance which exercises a power of stopping out the light more and more in succession, there being in all sixteen grades. The disc is rotated in a case which permits only one to be seen at a time. Its use will be perceived from the following extract from the instructions which accompany the instrument:—

"Having carefully focussed the picture, place the photometer against the ground-glass with the most transparent apertures over the half tones of the picture, viz., over such parts as are neither very strong in high lights nor in dense shadow; now carefully turn the centre button from left to right, keeping the eye about eighteen inches away from the aperture, when it will be found that the light admitted through the three small holes at the side of the larger one will become gradually less until they become almost undiscernible, but leaving the aperture still visible.

"When this is attained remove the instrument and ascertain the letter visible in the circular aperture at the back; the necessary exposure will at once be found opposite the corresponding letter on the table. For example, if the light transmitted be indicated by the letter O, the required exposure will be three minutes; if I be visible, six seconds. On the table given, the left-hand column represents seconds and tenths of a second; the right-hand column is given for minutes and parts of a minute."

GELATINO-CHLORIDE PLATES FOR CONTACT PRINTING.

By W. H. PRESTWICH, Warmington House, Tottenham.

MR. PRESTWICH having for some time been directing his attention to the preparation of opal plates capable of being printed out under a negative, has now brought his labours to a successful issue.

Some specimen plates received from him have printed very quickly

and given admirable gradation. The treatment throughout is the same as if albumenised paper were employed.

This will prove very useful to those photographers who would willingly produce opals were it not for the trouble and uncertainty encountered in their development, and the necessity of accurate timing of the exposure—drawbacks which are quite abrogated in these plates, in which the progress of the printing can be watched. The same system has been applied by Mr. Prestwich for producing clear glass plates for lantern or window transparencies.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
December 13.....	Newcastle-on-Tyne & N. Counties	Coll. of Physical Science, Newcastle.
" 13.....	Manchester Amateur	Masonic Hall, Cooper-st., Manestr.
" 13.....	Great Britain	5A, Pall Mall East.
" 13.....	Derby	Sykes's Restaurant, 33, Victoria-st.
" 13.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 14.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 15.....	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, December 1, at a meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. William Bedford presided.

Mr. F. A. BRIDGE read a paper upon *Spots, Stains, and Fading* [see page 775].

Mr. J. HUBERT said that he used bronzed enamelled mounts exclusively and never had spots upon his prints except from his own carelessness. He bought these mounts from a German firm; he had bought some of English make which he could not use.

Mr. H. M. SMITH exhibited a spotted photograph on a mount which had such excess of bronze that some of the latter could be rubbed off by the hand.

Mr. J. J. BRIGINSHAW said that the spots spoken of by Mr. Smith looked like measles in the paper.

Mr. A. HADDON remarked that the most injurious element in bronze was sulphide of tin.

Mr. A. COWAN stated that there were varieties of bronze; one variety was said to be exclusively brass powder. He had mounted photographs on the printed side of some bronze mounts and no signs of fading had appeared in nine months. Recently some photographs so mounted which had not been dried quickly showed faintly the lettering of the bronze printing.

Mr. W. H. PRESTWICH always used bronze mounts bought at different places and had never known them to cause spots, perhaps because he dried his prints quickly in a drying box.

Mr. BRIDGE stated that spots on some of the prints he had sent round seemed to be due to something in the white enamel; he should like to know what that something was.

Mr. HADDON thought that some bronze powder was "Dutch metal," which consists of copper and tin and contains no sulphur.

The CHAIRMAN had been troubled by spots which appeared only in the winter months; they were caused by the making up of a coke fire while the prints were washing. He supposed sulphur in the coke dust to be the injurious agent. He had seen mounted prints which had been done up in packets and the bronze designs on the backs of some appeared on the faces of others.

Mr. J. TRAIL TAYLOR had put damp prints upon a table and given some taps to a gas burner above them; this brought down dust, which caused spots. Impurities in the washing waters sometimes caused spots and occasionally found their way there by being washed out of cheap white indiarubber tubing used to convey the water. Sometimes shaking a daily newspaper over prints would cause spots, perhaps from the "chlor" or "antichlor" present. He bought some bronze powder once, and on the mount, where the face of the sitter would afterwards come, he painted therewith a skull and crossbones; it was long before any development of the design took place upon the print, indeed he had to place the print in a damp place for some time to force it to come out. In this case he had applied the bronze powder suspended in gum containing acetic acid. Perhaps the acid had as much to do with the appearance of the design as the bronze, but anyhow bronze was a nasty thing in the establishment of any photographer. Mr. Mason, of Glasgow, had told him that all photographers who bought bronze mounts of his firm were apprised that they did so at their own risk. Spots innumerable made their appearance from various causes before mounting.

Mr. W. M. ASHMAN said that in course of time out of thirty thousand prints on bronze mounts twenty thousand had been brought back to him with the demand for fresh photographs. The spots were just like those exhibited by Mr. Bridge. Bronze should neither be used upon mounts nor for the ornamentation of albums. Some peculiar marks upon a panel print exhibited by Mr. Bridge he thought to be due to dust from indiarubber tubing.

Mr. BRIDGE never used the white tubing; he used the red.

Mr. HUBERT stated that one cause of spots was the keeping of prints together too long while they were in a damp state.

Mr. P. EVERITT remarked that blotting and other papers sometimes contained chloride of lime. Once he had placed damp prints in a photographic *Year-Book*, and a few days later, on opening it, he found them covered with white spots the size of a pea.

Mr. ASHMAN said that Saxe and Rive papers could be trusted to be free from such impurities. The paper of almanacs was not supposed to be chemically pure.

The CHAIRMAN pointed out that after prints were fixed in hypo there could not possibly be any chloride of lime in the paper.

The HON. SECRETARY had recently seen a batch of paper pulp which had been bleached by ozone only.

Mr. EVERITT considered red blotting paper to be better for the surface-drying of prints than white; the former was coloured by Turkey red, obtained as waste from the cotton mills.

Mr. BRIDGE pointed out that where a piece of brass had been kept in contact with part of the face of a print, the print had become discoloured.

Mr. HADDON was not sure that the print had not been protected by the brass, while the surrounding portions had somewhat faded.

Mr. J. H. ZAEHNDORFF said that both starch and paste soon went sour. Was fresh starch always used for mounting?

Mr. BRIDGE replied that it was the custom always to use fresh starch. Some mounts had a bad smell when they were received from the makers.

Mr. ZAEHNDORFF remarked that the mounts themselves might be made by means of soft paste.

Mr. HUBERT stated that when unmounted prints were kept long in a damp state on the top of each other they acquired a bad smell.

Mr. ZAEHNDORFF was aware that alum was always put into paste to make it keep, so that it was actually boiled sour before being used in the manufacture of mounts.

Mr. HADDON thought that the chemical composition of the silver salt in faded prints should be ascertained. Sulphur seemed to be the chief delinquent in causing the fading. The dust falling from gas burners contained sulphur, so also did the dust found everywhere in the atmospheres of towns. The coal fires of London discharged tons of sulphuric acid into the air every day.

Mr. W. CONN knew insufficient fixing to be a fertile source of fading.

Mr. A. MACKIE said that it was remarkable that the gold of prints seemed to bleach as much as did the silver.

Mr. W. M. AYRES thought that albumen should never be more than two days old before it was used for preparing the paper; he was convinced of this from experiments which he had tried. Paper prepared with albumen fourteen days old gave innumerable spots, and speedily turned yellow.

Mr. COBB remarked that Mr. Valentine Blanchard had once astonished a photographic society by bringing forward his experience that stinking albumen yielded best prints.

Mr. TAYLOR said that salters of paper preferred for use albumen which had been kept a few days.

Mr. COBB stated that perhaps hypo was not such an enemy to the permanency of prints as commonly supposed. The late Mr. Pearsall tried to make a print fade by putting it into hypo, and afterwards keeping it without washing; two years later that print was in as good condition as any of the others in the album.

Mr. COWAN remarked that Mr. Pearsall took the print direct from the hypo bath, and mounted it straight away.

Mr. MACKIE believed that Mr. Bolton had tried the same experiment.

Mr. BRIDGE said that others had had the same experience.

The HON. SECRETARY stated that his first negatives were simply rinsed under a tap, because he then knew no better, and some of them were at present better than any he had taken since.

Mr. EDGAR CLIFTON had known similar cases.

Mr. BRIDGE had known bromide enlargements to keep well for years after being simply rinsed when taken out of the hypo.

Mr. COBB, from what had just been stated, began to suppose that hypo in the film was really a preservative.

Mr. CLIFTON thought that if the prints were only left long enough in a sufficiently strong fixing solution, there was not much to fear if hypo were left in them afterwards.

Mr. ASHMAN said that Mr. Dunmore had long publicly argued that hypo was harmless when left in prints.

Mr. MACKIE thought it likely that hyposulphite of silver, rather than hyposulphite of soda, in the film, was the cause of fading. As he understood the matter, when the prints were put in the hypo, hyposulphite of silver, a salt insoluble in water, was first formed; this then began to dissolve in the excess of hypo present, forming therewith a double salt, soluble in water; consequently, if the fixing bath were not strong enough, or the prints not kept in it long enough, hyposulphite of silver might be left in them, instead of being wholly transformed into double salt removable by the washing waters.

Mr. COBB thought, after the revelations of that evening, that the Association ought to boycott every photographer who used bronze powder.

Mr. CLIFTON possessed one of the cheapest, commonest, German bronze printed albums, but it had not injured the prints contained therein.

Mr. HUBERT stated that the makers could not get rid of those albums in Germany, so sent them over here.

A question in the box asked what were the qualities of dry plates prepared with a maximum of bromide of silver and a minimum of gelatine.

Mr. ASHMAN replied that they would have a matt surface.

Mr. COWAN said that they would give clean shadows.

Mr. HUBERT thought that they would be deficient in half tone.

Mr. ASHMAN added that they developed more quickly and gave a nice negative quicker than if they contained a larger proportion of gelatine. Mr. Starnes had tried the opposite extremes of the minimum of bromide of silver and the maximum of gelatine; in fact, he sometimes used only a quarter of a grain of bromide of silver to each quarter-plate, but then he required from twenty to thirty minutes to develop a picture, so the plates would not do for professional photographers.

Mr. J. B. B. WELLINGTON stated that the less the proportion of gelatine in the emulsion the more opaque was the image. He had sometimes found plates rich in gelatine to develop and fix quicker than those with less gelatine.

Mr. ALLEN exhibited and called attention to Wolf's patent adhesive mounts.

Mr. TAYLOR stated that in about the year 1876 he was called upon by Mr. Edwards, a patent agent living in Southampton-buildings, Chancery-lane, who showed him a specification for making mounts of exactly the same description as Wolf's, and at the request of the agent he went to a "swearist" and swore

[Oh!] that the thing was likely to be useful. However, the wise people at the Patent Office would not grant provisional protection to the invention, which they looked upon as one quite beneath their dignity to notice. Quite recently, nevertheless, they had granted a patent for this very identical thing which they had previously rejected.

Mr. MACKIE said that somebody had written to a journal to prove that the mounts before them were cheaper than those of ordinary make, but the letter itself conclusively proved that they were dearer.

Mr. H. M. HASTINGS exhibited negatives and prints of gas and candle flames, photographed instantaneously by means of the flash produced by igniting magnesium powder and gun cotton. The gas fittings, candlesticks, and candle smoke, also appeared in the pictures. The exposures, he said, were too short to give good images of the flames without the magnesium flash, some of the light from which was therefore evidently reflected by the flames.

Mr. TAYLOR, replying to a question, said that a little lump of camphor in gum would make the latter keep at least fourteen months without getting mouldy.

Mr. BRIDGE said that it was a curious thing that camphor in the silver sensitising solution in some cases prevented the blistering of prints.

Mr. SMITH asked the value as a mount of the "gloy" used by box-makers.

Mr. CLIFTON had known prints to change when mounted with gloy.

Mr. ZAEINDORFF remarked that gloy was made from Irish seaweed; there were two varieties of it—the one neutral and the other acid. He did not think that they would be good for mounting purposes.

Mr. ASHMAN stated that camphor would make a weak solution of albumen, containing a trace of ammonia, keep well for more than a year. He thought that camphor could be more utilised by photographers than it is at present.

Mr. L. MEDLAND said that Mr. Ingall dissolved some commercial stuff in the oil of the optical lantern, and it was a great preventative of smell and smoke. The stuff smelt as if it contained camphor.

Mr. BRIDGE remarked that in the days of sperm oil lamps in optical lanterns, camphor was usually dissolved in the oil to increase the light.

Mr. Hubert exhibited a photograph taken by a flash of light produced by gun cotton and powdered magnesium.

Mr. TAYLOR said that in 1865 he exhibited to the South London Photographic Society pictures taken by a flashing magnesium light; the mixture contained sulphide of antimony, chlorate of potash, and powdered magnesium. The flash was so quick that the sitter was taken before he had time to blink or start. He had a portrait of himself, taken at that time and in that way, so the plan was not quite so new as some of their German friends seemed to think.

Mr. Cowan exhibited a strongly marked example of a positive image left upon a plate, after dissolving off a negative image with hot water.

Mr. F. B. Cembrano exhibited some platinotype prints of landscapes.

Mr. ASHMAN called attention to Mr. H. J. Burton's actinometer, as used by the Autotype Company, consisting of a row of small portrait negatives of the same density, covered with an increasingly dense screen, both placed upon a piece of standardised sensitive silver paper, which printed at the same rate as the carbon tissue in use. The large negative to be printed was compared with that one of the little ones which seemed to be of the same density as itself; consequently when the little one gave a good silver print of itself, the large one had been exposed the proper time over the tissue. On the tissue there was, of course, no visible image, hence the utility of the little silver print.

The HON. SECRETARY announced that next Thursday evening, December 15, Mr. W. H. Harrison will read a paper before the Association on *Lanterns and Lantern Slides in the Nineteenth Century*, and that on the following Thursday Mr. Norman Macbeth will read a memoir upon *Art as Applied to Portraiture*.

CAMERA CLUB.

ON Thursday, December 1, Mr. T. C. HEPWORTH delivered a popular address to the members on *The Application of Photography to the Arts and Sciences*. Mr. H. Trueman Wood occupied the chair.

The lecture was fully illustrated by means of the optical lantern. Mr. Hepworth described several of the processes used in photography, and showed transparencies to illustrate the characteristics of different methods. Slides showing the uses of photography in microscopic and telescopic work and illustrating spectrum analysis were also put through the lantern in connexion with the course of the lecturer's remarks.

A discussion and conversation followed, in which the Chairman, and Messrs. Lyonel Clark, Rodgers, Davison, Ferrero, and Spiers, took part, and the proceedings were brought to a close by a reply from Mr. Hepworth.

On Thursday, December 15, the two hundred English lantern slides intended for the American exchange of this year will be exhibited. Meeting at eight p.m.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The Committee of this Association met on the 1st instant.

After the minutes of the previous meeting had been confirmed, the Committee proceeded to discuss the best means of attaining the fulfilment of the stipulated conditions of the Special Orphanage Fund, viz., to raise the sum of 500*l.* within one year, the originator having given twenty guineas to start the fund. It was thought that this sum could be raised amongst photographers, and a sub-committee was appointed to draft a prospectus for issue to all connected with the profession.

The following sums were also promised:—The Chairman (Mr. W. M. Ashman), 10*l.* 10*s.*; Mr. W. Bedford, 5*l.*; Mr. J. Zaehnsdorf, 2*l.* 2*s.*; and through a member of the Committee, 1*l.* 1*s.* Mr. BEDFORD also stated he believed he could bring another donation of 10*l.*

Mr. C. Darker, of Forest Hill, was elected a member of the Association.

Mr. T. S. Hicks was appointed Local Secretary for the Sheffield district.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The annual meeting was held on Thursday, the 24th ultimo, at the Royal Institution, Colquitt-street.—The President, Mr. George H. Rutter, in the chair.

The minutes of the last meeting were read and confirmed.

Messrs. W. C. Bustard and T. O. Forshaw were unanimously elected members of the Association.

Mr. T. S. MAYNE, Hon. Secretary of the Exhibition Sub-Committee, gave some particulars of the arrangements, and distributed prospectuses which had been prepared for circulation.

The HON. SECRETARY called attention to the competitions instituted by Messrs. Fry & Co. for lantern slides and argentic bromide paper, and distributed some entry forms that had been forwarded to him. He also exhibited negatives and prints therefrom of a coloured diagram, taken on an Edwards's orthochromatic plate, with an exposure of ten minutes to gaslight in a room lighted with three ordinary burners.

The President exhibited Marion's developing box, filled with "ten per cent." solutions.

The HON. SECRETARY had to apologise for the non-exhibition of the competition prints which had been announced, as a good deal of disappointment was felt at the failure of this part of the programme. Mr. B. J. Sayce kindly agreed to allow them to remain on exhibition at his office, 11, Reicross-street, for a week from November 28.

The HON. SECRETARY read his annual report, from which we make the following abstract:—

During the year nineteen new members have been added and thirteen have retired or lapsed, bringing the total number to one hundred and forty-six, a growth which is satisfactory, though not apparently so large as in some previous years, when it is remembered that it represents an actual addition of the working strength of the Association of more than a dozen members. The numbers on the books for the five years are:—1883, one hundred and fifteen; 1884, one hundred and thirty-eight; 1885, one hundred and thirty-four; 1886, one hundred and forty; 1887, one hundred and forty-six.

As regards the work of the Association, the meetings have kept up their interest, though without any special novelties or striking discoveries to record. Papers have been read on *A Holiday in the North Riding*, by Mr. A. W. Beer; *Odds-and-Ends*, by Mr. George H. Rutter; *Orthochromatic Photography*, by Mr. W. A. Watts; *The Objects of Antiquarian and Photographic Interest in the Hundred of Wirral*, by Mr. John Hargreaves, F.R.H.S.; *Five Dry-plate Processes from 1861 to 1865*, by Mr. B. J. Sayce; *Notes of a Visit to the Autotype Works*, by Mr. W. A. Watts; *Slow Development*, by Mr. A. W. Beer; *A Holiday among the Taras*, by Mr. W. B. Irvin; and *Picturesque Italy*, by Mr. G. E. Thompson. Also a demonstration of the Eastman stripping films has been given by Dr. Keayon, and discussions have been held on *Detective Cameras*, *Paper Films versus Glass*, and *Slow Development*.

In addition to the papers and discussions, interesting exhibits of work and apparatus have been made by many members.

It is much to be desired that members having anything to exhibit would hand it to either the Exhibits Sub-Committee or the Hon. Secretary, with particulars they may wish mentioning, as thereby a wider circle of interest is secured and the Hon. Secretary is enabled to keep a more accurate record of the proceedings.

At the March meeting the Annual Lantern Slide Competition was held, at which there were five competitors, who had sent in three slides each. It had been decided by the Committee that the prizes at this and, if possible, all future competitions should consist of medals, and accordingly the silver medal was awarded by the Judges, Messrs. Atkins, Boothroyd, and Sayce, to Mr. A. W. Cornish.

The Annual Competition was held as usual, the Judges being Messrs. Boodle, Boothroyd, and Thompson. The prints were sent in at the October meeting, and the Judges gave their decision in writing during the ensuing week. Eleven competitions were sent in, and the result of the competition was that the prizes for "Street view" and "Architectural" were awarded to Mr. A. W. Beer; those for "Bridge" and the "Best picture taken at an excursion" to Mr. J. H. Day; that for "Marine" to Mr. T. B. Sutton; and for "Instantaneous" to Mr. David Lewis.

As it had been felt for some time past that the nature of the prizes given required revision, neither money prizes nor prints appearing quite satisfactory, the Council have had under their consideration for nearly the whole year the advisability of substituting medals for any other form of prize, thus assimilating the practice of this Association to that of the more important Photographic Societies elsewhere; accordingly the nature of the prizes was not announced at the beginning of the year, but the question was left open for future decision. At the Lantern Slide Competition in March, a silver medal was awarded, but this was not the Association's own medal, hence this form was unsuitable for permanent adoption, and it was found impracticable to adopt any permanent form of prize until the Association had its own medal. After much discussion a design has been selected, and the die is in progress of execution, and as this decision was come to before the prints in the Annual Competition were actually received, the Council decided to give the medal to those prize-winners who preferred to receive it. The gentlemen named above are therefore entitled each to a bronze medal. The Council believe that the substitution of medals for prizes of a more ephemeral nature will prove highly satisfactory to the competitors themselves, and that it will lead to a more general interest being taken in the Prize Competition, and to a larger number of members striving to secure so honourable a reward for their work.

For the competition of 1883 the Council recommend certain alterations in the by-laws: first, to revert to the old method of sending in, viz., on the evening of the annual meeting, the award to be made same evening; second, to require competitors, except for the enlargement, to send in a series of six pictures, no special subjects being announced for each class; third, to award a silver and bronze medal for the best and second best series of size "half-plate and under," and over half-plate respectively; also a medal for best enlargement, and silver and bronze medal for the best and second best set of six lantern slides; fourth, only winning exhibits to become the property of the Association, but competitors to give an unmounted print of each subject in exchange for their mounted exhibits.

The Council selected two negatives, viz., *A Cheshire Lane* (by Mr. Beer) and *Doorway at Tabley Hall* (by Mr. Day), for reproduction as presentation prints for last year. They were accordingly executed in carbon as 15×12 enlargements, and copies have been presented to all members who have paid their subscriptions for 1886.

For this year a suitable presentation print or prints will be selected and distributed among the members elected prior to October, 1887.

It was not thought desirable this year to take the usual part in the associated *soirée*, mainly on the ground that with the large variety of interesting objects there exhibited photographic objects scarcely seemed to secure their due share of attention; and it has been decided that the Association shall have its own *soirée* and exhibition of photographs, in hopes that thereby the general public may be enabled to have a better idea of the progress photography is making.

The HON. TREASURER next read his report and balance sheet, which were highly favourable.

Both reports were unanimously adopted.

The election of officers was then proceeded with, the following being duly elected:—*President*: Mr. B. J. Sayce.—*Vice-Presidents*: Messrs. F. T. Paul, F.R.C.S., and H. N. Atkins.—*Treasurer*: Mr. Joseph Earp.—*Librarian*: Mr. Walter Hughes.—*Auditor*: Mr. W. H. Kirkby.—*Hon. Secretary*: Mr. W. A. Watts, Farnworth, Widnes.—*Council*: Messrs. P. Lange, H. Lupton, W. P. Riley, and G. H. Rutter to replace the four retiring members.

The PRESIDENT then stated that the Council recommended certain alterations in the rules for the annual competition, as stated in the report. These were carried unanimously, with the alteration that in the class for enlargements there should be a silver and a bronze medal for best and second best series of two.

Mr. E. TWIGGE exhibited a series of lantern slides mounted as transparencies, developed by various processes, as an illustration of the nature of the slides desired by the Recreative Evening Schools Association, of which Miss F. Calder is Hon. Secretary. He recommended their undertaking to the attention of the members, and pointed out how they could assist them by undertaking to make some lantern slides illustrating the fifty years of the reign of Queen Victoria.

BOLTON PHOTOGRAPHIC SOCIETY.

ORDINARY monthly meeting held at the Baths, Bridgman-street, December 1, 1887.—Mr. E. N. Ashworth in the chair.

After the minutes of last meeting had been read and confirmed, the Secretary laid before each member circulars from the Liverpool and Hyde Societies referring to their various exhibitions.

Mr. JABEZ BOOTHROYD then gave a lecture on *Photographing in Colours: is it Possible?* in which he took the negative.

After the lecture there was a discussion, to which Mr. Boothroyd replied.

Mr. C. K. DALTON proposed a vote of thanks to Mr. Boothroyd, and hoped that other members would volunteer to give papers or demonstrations. Mr. ASHWORTH seconded the vote, which was accorded unanimously, and Mr. Boothroyd replied.

Mr. Johnston, M.D., exhibited a series of views from various countries, which were examined with interest and much admired.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE first popular meeting of members and friends was held in the Large Hall of the Philosophical Society's Rooms on November 10.

Mr. LANG, JUN., F.C.S., occupied the chair, and introduced Mr. T. N. ARMSTRONG, who delivered a lecture entitled *A Trip to Brighton*, which was illustrated by a series of limelight views, and proved very interesting, the audience showing their appreciation by frequent and hearty applause.

A short poem, illustrated with slides, was read, with much acceptance, by Mr. ARMSTRONG, the meeting all through being of a very agreeable nature. The audience, too, was one of the largest that has yet assembled at any of these popular meetings, which are proving very popular indeed among our members and their friends.

At the close of the lecture a vote of thanks, proposed by the CHAIRMAN, was heartily given to Mr. Armstrong for his pleasant and agreeable lecture.

THE usual monthly meeting of the Association was held in the Philosophical Society's Rooms, 207, Bath-street, on Thursday, December 1. Mr. William Lang, jun., F.C.S. (President), occupied the chair.

The business of the evening being of great interest, a very large audience was present.

After the routine business had been disposed of, Messrs. R. Rae (67, Bothwell-street), W. H. Turner (Gourrock), and Ex-Bailie Crauford (Mitter-street), were unanimously admitted members of the Association.

The CHAIRMAN then called upon Mr. T. N. ARMSTRONG to read his paper on *Photographing by the Flashing Magnesium Light* [see page 777].

The above paper proved exceedingly interesting, and showed that Mr. Armstrong had been at great pains in perfecting this latest mode of artificial lighting.

An extemporised studio having been fitted up in the rooms, a demonstration followed, when Mr. Mason and Mr. Sloan sat for their portraits, and when the negatives obtained were developed they showed clearly that the light thus arranged and adapted was all that could be desired for the purpose.

After the demonstration of the light, the negatives, which were taken on Eastman's films, were developed, as has been said, and the method of stripping, fixing on extra support, &c., was shown by Mr. Armstrong; and thereafter the Chairman called upon the members to ask any questions or to make any remarks they wished on the paper and processes brought before them.

Mr. URIE said that he was sure that he spoke the feeling of the Association when he said that Mr. Armstrong had conferred a benefit upon the Association in bringing the results of his experiments before them. Of the many lights he had tried he had not in all his experience seen one which was likely to prove so successful or so easy of adaptation as the one shown to-night. He was sure that it would entirely supersede all others now in use. The films also, he thought, were likely to come more and more to the front, removing as they did the unwieldy glass plate, and doing away with the weight of the glass, which was a great grievance to be desired, as the weight of a photographer's negative caused great inconvenience. Altogether both demonstrations had proved very successful, and he was sure many would be induced to make a trial of the light after the splendid results which had just been obtained.

Mr. STEWART said that Mr. Armstrong's demonstration had proved the great advantage such a light must be to those engaged during the day, and who had no time except at night to devote to photography with the simple expedients seen to-night, which were easily procurable in every house. Amateurs were placed in a position to take advantage of the only time at their disposal. He however, disagreed with Mr. Armstrong regarding the loss of the powder in blowing it through an ordinary gas jet; from the experiments he had made himself he found a considerable quantity was blown through without igniting, and was thus wasted. He would recommend instead that a large Bunsen burner be employed, and that a long thin tube be used (in which fifteen grains of the powder had been placed—that being about the quantity necessary) to blow it into the flame, thus securing an equal light every time along with more perfect combustion.

Mr. ARMSTRONG, in reply to Mr. Stewart, said that while experimenting he had tried the Bunsen burner, but dispensed with it, as he thought a greater amount was blown through without ignition than in the ordinary gas jet. He found also that the Bunsen burner was exceedingly difficult to fix without

casting a shadow, while a light gas jet could be readily placed in any position and no shadow was cast from it. Regarding the tube, with a measured quantity of powder, he thought it a very good idea, but thought the wash bottle could be adapted with a bulb to blow just a certain quantity every time and thus save the difficulty of measuring for every discharge.

Mr. G. BELL suggested that the magnesium might be burned in a lamp with a chimney to carry away the fumes, as they were anything but pleasant, and he was sure would—if a number of photographs were done at the same time—soon fill the room or studio with smoke, and put a stop to any further photography.

A number of other members spoke corroborating what had already been said, and thereafter a hearty vote of thanks was accorded Mr. Armstrong for the trouble he had been at, and for the exceptionally interesting nature of the subject which he had treated so admirably.

The CHAIRMAN (Mr. Robertson) then called upon the PRESIDENT to read his paper on *Removing Gelatine Films from their Glass Support, and Conversion of an Ordinary Negative into a Film Negative* [see page 776].

The paper, which is intended to stimulate experimenters to try, if possible, to remove the film in such a manner as the glass may be itself uninjured, while the film is removed without injury, so that it may be preserved and printed from. Mr. Lang passed round some he had stripped in the manner described in his paper. These showed that there was something in his suggestions which might easily be developed were someone to experiment in this direction.

After the reading of the paper, Mr. Lang showed the removal of the film from its glass support; but, as the hour was now late, he did not succeed in time in adjusting it to the Eastman film (which he uses as a support instead of the glass) to show the final result to the meeting.

After a few members had spoken regarding the great advantage of an easy and simple process such as Mr. Lang aimed at in his paper, a vote of thanks was accorded Mr. Lang, and thereafter the meeting separated.

Correspondence.

DECEMBER MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE.—INSTANTANEOUS PROOFS.—A DODGE TO REPLACE LARGE PRINTING FRAMES.—AN INSTANTANEOUS SHUTTER.—A COLOURED GELATINE FOR LANTERNS, &c.

THE Photographic Society of France held their monthly meeting on Friday evening last, the 2nd instant, M. Davanne in the chair.

Some very fine instantaneous proofs were exhibited by M. Roger. Views of a farmyard, with ducks, geese, cocks, hens, and other poultry, were shown. These gave great satisfaction, and the author was complimented by the members, who knew the difficulties to be overcome in photographing a number of hens while picking up their food, especially when their images are photographed to a certain size. In those sent round the image of a hen covered the space of about an inch square.

An idea was suggested that in order to economise the expense of purchasing printing frames for very large operations, such as maps, plans, and very large photographic proofs, the printing frame and its heavy glass could be replaced by a light wooden cylinder; the paper, whether albumenised, platinised, or ferro-prussiate, is stretched on the cylinder by means of drawing-pins, and the paper or film negative is laid upon it. The apparatus is then set out in open day and kept turning, so that every part shall be equally exposed to light. "This rotary motion I obtain," said the proposer of the system, "by means of a clockwork apparatus, as used for roasting joints of meat."

M. Conti exhibited an instantaneous shutter, which opened and closed in the centre, slit fashion. Long and short exposures can be obtained. So many shutters are now in the market that it is impossible to describe every new one. It was said before the Society that a gentleman (I think Eder) had taken the trouble to count, and he had found that three thousand had been presented to different societies. I imagine myself that he is below the mark.

M. Nadar exhibited McKellen's camera, a new detective camera made after his own designs, and some proofs on Eastman's paper, which were toned in different shades, from the photographic colour to the sepia tint.

M. Marguerie exhibited a metallic tissue covered with gelatine-tinted red for dark-room illumination. This system is to be preferred to the simple gelatine sheet, as it cannot be cracked or broken. It will bear bending to any shape, and is useful to make cylinders for lanterns. (I send a piece, which can be seen at the editorial office of this JOURNAL.)

59, Rue des Batignolles, Paris.

PROF. E. STEBBING.

FOREIGN CORRESPONDENCE.

To the Editors.

GENTLEMEN,—Thinking the enclosed extract might be of interest to some of your readers, I have ventured to send it to you:—

"RELIGION AND PHOTOGRAPHY.—A writer in the Melbourne *Weekly Times* gives the following:—One would scarcely expect to find much religion in connexion with photography. The other day, however, I was talking to a man whom I once knew to be a very pronounced Atheist. To my surprise I now found him a sincere and reverent believer in the existence of an omnipotent God. His conversion had not been the result of argument, but was due solely to photography.

"Some couple of years ago," he told me, "I took to the pursuit of photography for amusement. The fascination which it appears to have for all who dabble in it took a strong hold upon me. Whenever I could get a spare hour I was out in the fields or along the river banks pointing my lens at the various

pictures which nature scatters all round us, if we have but the eyes to see them. I used to take my pictures home, and night after night in my lonely lodgings I would spend hours gazing at them. It was at first merely the pleasure of a gratified sense, but after the pleasure came thought. As I gazed at the miniatures, in which every leaf of the tree, every shell upon the shore, had struck its faithful image on the tiny plate, I became lost in wonder at the powers of science and at the skill of man to put those powers in motion. This led me on. Man put the power of light and chemistry in motion; who put the man in motion? This could only admit of one answer—a Higher Power. The rays that were striking the pictures upon my sensitive plates had brought the light to me. I was an Atheist no longer; and I believe that any man who reads the Book of Nature as illustrated by that most faithful of all artists, Photography, must believe thoroughly in the existence of a Supreme Being. Man can make the light act as his artist, but there must be some First Source who has said "Let there be light" for him."

The phase of our art-science here referred to is one which I have not seen noticed before; but if it should, in any instance, lead to the happy result described, then I think its followers have another reason for feeling interested in its pursuit, as well as for being proud and grateful to think that so fascinating an art may have so elevating and refining an effect upon its students: but such a result could only have occurred to a thoughtful, reasoning mind, of which there are, undoubtedly, many in the brotherhood.

While writing, I cannot refrain from referring to a subject which has always been of deep interest to me, and, I am sure, to others also. I mean the mode of working adopted by the late Mr. Breeze in producing the wonderful transparencies which were so frequently referred to a few years since.

A neighbour of mine here states that in the summer of 1873 or 1874 he was staying at Matlock, Mr. Breeze being there at the time; he showed my friend (who was about nineteen or twenty years of age at the time) a very large collection of transparencies, some of them being of most exquisite beauty, and many being instantaneous, as, for instance, seascapes, with the waves standing up, the crests sparkling and in the very act of breaking, looking as if arrested and suddenly transformed into ice or glass! Scenes having the moon showing its reflection upon the ripples of water! One very wonderful picture—which Mr. Breeze said had been exhibited in Paris, and puzzled all the artists (photographers) there—was a landscape showing a beautiful valley, over which hovered the form of an angel, producing a very startling effect. Mr. Breeze used to wait ready at the window of a cottage there and take instantaneous shots at a passing train; he used also to go out with the camera on bright moonlight nights to take views about the vicinity of Matlock. My friend says he has seen these pictures, but, not being a photographer, he had no idea how they were done. He knows that the train was taken sharply by an instantaneous exposure, for he has seen him flashing a black velvet screen from before the camera at the window. While Mr. Breeze persisted in affirming that he had discovered a means of taking these moonlight pictures, at the same time he said he never would divulge the secret, which he had worked out himself, and which others would have to do if they desired the knowledge. Upon one occasion he read a letter from some lady of eminence (an authoress, or a lady of title, he thinks) in which a very urgent appeal was made to Mr. Breeze not to let the secret die with him; but the arguments and entreaties were used in vain—Mr. Breeze was obdurate and would divulge nothing. He seemed to have been annoyed and made stubborn, to some extent, by persons who never succeeded in doing it saying they knew how these pictures were made; and by others affirming that they were not what they professed to be. Anyway, he seems to have worked much in the spirit of the ancient alchemists when seeking the means of transmuting metals.

Of course, never having had the luck to be able to see the dear old country (although a dream of my life), I have never seen one of these wonderful productions of Mr. Breeze, and all I know of them is from what I have read in your pages; but, from what my friend tells me, he had a very large number of them—some boxes full—and possibly these are in existence yet, or some of them; if they are, might it not be possible, in the light of the discoveries of the last eight or ten years, to find out something of the way in which these very beautiful pictures were made, by a critical examination of some of them, if they could be got at (and authenticated)? I don't know anything more beautiful in photography than these same transparencies.

I recently had a very peculiar experience, which is, perhaps, worth relating. I had used an enamelled baking (or pie) dish for fixing a few plates in, and had left the old hyposulphate of soda solution standing in it for some weeks; finally, I threw it out, and filling the dish with clean water I threw some old plates in it to soak, leaving it standing in this condition for some considerable time longer. The hyposulphate had stained the bottom of the dish almost black, but I thought this would give way to rubbing, perhaps, with soda, or whiting, or wood ashes; but I was much surprised to find my efforts almost without any effect, the enamel seemed to be permanently blackened as far up as the hypo had reached; finally, I poured in a few drops of hydrochloric acid, running it over the stained parts for a few minutes; this quickly removed most of the stain, but not all, and it left the bottom of the dish of a faint yellow tinge instead of white. However, I washed it out with clean water copiously, and, filling it, put two or three small prints in it to wash; after running the water off a few times, I left it full, with the

prints in it, standing out in the light. In the morning I was surprised to find the dish again almost as black as ever, with distinct marks of where the prints had laid upon the bottom, lighter in the colour than the rest. I emptied it and refilled it several times; finally, I left it full of water, thinking the stain permanent, but after the lapse of a few weeks I find almost all the black colour gone, but with it the glassy surface of the enamel, which now presents the appearance and feel of a piece of sandstone, while from the line of the stain up to the margin of the dish it is smooth and white, having a perfectly vitreous surface.

The question I should like to solve is, What dissolved or disintegrated the surface of the enamel? Evidently some enamels are not safe for photographic use.—I am, yours, &c.,

ALEX. J. SIMPSON.

Lismore, N. S. Wales, Australia, Oct. 22, 1887.

PHOSPHORESCENCE IN THE DARK ROOM.

To the Editors.

GENTLEMEN,—I have read with interest your article on *Phosphorescence in the Dark Room* in your impression of the 18th ult., and should be glad if you would explain the following case of phosphorescence which your article does not appear to include. I almost invariably observe a vivid flash of phosphorescence when putting the developed and rinsed plate into the alum bath (saturated solution, no acid or other chemical) before fixing. This flash never takes place when ammonia is used in the developer. The developer used is that of Eastman (for paper negatives) with a small quantity of bromide, and the Platinotype Company's sulphopyrogallo.

I have tried to produce the phosphorescence with the above developer in the way you described (without the dry plate), but have not met with success.—Awaiting your elucidation, I am, yours, &c.,

C. E. HODOKIN.

[The natural acidity of the alum solution in our correspondent's case no doubt affords the necessary stimulus, the remaining and really active agents being the same as in the experiments quoted by us. Soda appears to have a stronger effect than ammonia, which possibly requires the presence of a larger proportion of bromide to produce the result. With regard to the want of success in repeating our experiment, perhaps here, also, our correspondent fails from want of sufficient bromide, which, as we pointed out, is the chief essential.—Eds.]

THE PHOTOGRAPHIC SOCIETY.

To the Editors.

GENTLEMEN,—I observe Tuesday, the 13th, is fixed for the meeting to finally approve the new laws of the Photographic Society of Great Britain. In the copy of the proposed laws which has reached me I note specially No 13, on "Photographic Exhibitions." I find the words, "That if the necessity arises for awards, the election of judges be in the hands of the body of members." This is well as far as it reaches, but unless I have entirely misunderstood the wishes of those members with whom I have come in contact, something far beyond this is wished by most. This is the moment, in my opinion, to carry out the long-desired plan of putting an end, once and for all, to the great complaints of unfair awards, by allowing the body of members of the Society to themselves adjudge the medals, which I propose to effect in this simple manner:—

Let due notice be given of the day and hour when the hanging is to be completed, and at that time let all members who are inclined, and whose subscriptions are paid, attend, and being furnished with a paper by the Assistant Secretary, and all other persons being excluded, let them then and there examine the pictures, and write on the paper the numbers and names which in their opinion are entitled to medals. These papers being signed, shall then be handed in to the Assistant Secretary, and a committee of five of those members then present being appointed then and there shall at once examine these papers, and from them award the medals to those having the highest number of votes.

I propose, if the state of my health permit, to attend the meeting, and to offer a resolution embodying the above proposal, which I fully believe would put an end to complaints of unfairness in distribution of medals. I respectfully invite members to attend in full force, and, if agreeable to them, to support me on the occasion.—I am, yours, &c.,

SAMUEL FRY.

Sherington House, Grove-crescent, Kingston-on-Thames, Dec. 5, 1887.

THE LIVERPOOL EXHIBITION.

To the Editors.

GENTLEMEN,—Is not your correspondent, "A Medallist," a trifle severe on the Liverpool authorities, who ought rather to receive a word of praise for their courage in venturing a departure from the well-worn rut in which the chariot of fame has for photographers jolted hitherto so painfully along.

It is not the medallist in person who has been boycotted, and your correspondent usually speaks in such pleasant fashion, and with such grace of diction, that it is a positive joke to catch him tripping. Liverpool desires to see some new work, not the same old clothes and the same old hats which have done good service in the south furnished up afresh for the northern metropolis. Granted some of its old ideas have been exceedingly fine, large as well, if the concession will salve a

wounded spirit, but surely it is not an impossibility to endeavour to excel past merit, late though the hour may be. There is plenty of weather before us, and plenty of subject, to warrant an attempt if not at beating the record at least of running it closely.

Instead of sitting down in doleful dumps let medallists and non-medallists do their level best to make the Liverpool show not a home for the destitute or mediocrity's millennium, but a survival of the fittest photographers.—I am, yours, &c., SCRIBBLER.

Harrogate, December 5, 1887.

To the Editors.

GENTLEMEN,—It has always been my idea that the first consideration in a provincial exhibition was to attract the best work that had been done during the preceding year, the second to get together sufficient padding to make up an exhibition. The committee of the Liverpool Association seem to be reversing this order, and offer prizes to the padding, and the cold shoulder to the best work. It has not perhaps occurred to them, as pointed out by "A Medallist" in your last, that they have done their level best to deprive themselves of the best work of the masters of the art in their coming exhibition. Is it too late to correct this stultifying error?—I am, yours, &c., E. R.

Aigburth, December 6, 1887.

Answers to Correspondents.

- J. C. BROWNE and numerous correspondents next week.
R. H. BLYTH.—The front may be employed as a landscape lens.
B. C.—The difficulty arises from the tissue being insoluble, probably from long keeping.
R. W. S.—Follow the instructions given in the article implicitly, then, if you require any further information, write again.
F. A. C.—Transparencies are frequently made by immersing the paper in silver and printing with either side next to the negative.
A. R. CORDOR inquires the difference between the orthographic and the orthoscopic lenses.—They are the same lenses under different names, with perhaps a trifling modification by the different makers.
W. W.—The cameras and lenses named are quite as good as can reasonably be expected for the money charged for them; but, of course, they will not compare with instruments of the more expensive class.
PROVINCIAL.—If you can prove that the enlargement was injured by a projecting nail in the packing case, the firm who sent it thus carelessly packed should certainly replace it. We do not at all see how the railway company can be made responsible.
SCOR.—We cannot tell where you can procure sheet gelatine from the sixteenth to the eighth of an inch in thickness. We surmise you will have to make it for yourself. Perhaps, however, those who manufacture the thin sheets will make the thick to your order. Try.
E. J. A. inquires: "1. Does registering a photograph make it copyright?—2. Must I have copyright printed on every copy that is sold?—3. If not, can any one copy it?"—1. No, unless you possess the right to do so.—2. No.—3. If copyright it can only be copied at one's peril.
A. Z. (Worcester).—The reason you cannot get the image in focus when copying the portrait the same size is that the camera does not extend to a sufficient length. Bear in mind, in copying an object the same size, that the camera must extend to double the equivalent focus of the lens.
Y. Z. X.—Why trouble yourself to prepare the iodised paper, even if you could obtain a suitable kind of paper, when you can purchase gelatino-bromide papers of different grades ready for use? They will yield results far superior to any you enclose, or perhaps any you will succeed in getting by your method of working.
PINHOLE PHOTOGRAPHY.—No fewer than six correspondents inquire what Mr. Forgan, of Edinburgh, means by a "pinhole" which is forty-eight hundredths of an inch in diameter. The paper was printed as received. One says, "Surely a trifle under half an inch is not a very small aperture, and Mr. Forgan must get his pins made to order. I never met with one of that size."
J. S. RAYNER.—The fault in the prints is not due to the toning but to the unevenness in the albumen on the paper, some portions having a thicker coating than others. Furthermore, there are a number of air-bubbles in the albumen which produce what you term the "blotches." It is the most unsatisfactory sample of albuminised paper we have seen for a long time. Is it of your own albuminising?
C. W. WARD complains that he cannot succeed in making a solution of india-rubber, as the rubber will not dissolve.—The difficulty may arise either from an unsuitable rubber being used or a wrong medium being tried. Vulcanised rubber cannot be dissolved in the usual solvents, nor can the proper kind of rubber be dissolved in the benzoline of the oilshops, which is often tried for the purpose. If our correspondent will procure a sample of what is known as "masticated rubber" and use good benzol—not benzoline—his difficulty will disappear.
W. J. HARDING (Wanganin).—As the gold residues are in the condition you state the best plan will be to add sufficient solution of protosulphate of iron to ensure the precipitation of all the gold in the metallic form, then wash well with water, and afterwards treat the residue with dilute hydrochloric acid; this will dissolve out the lime and any iron that may be present, leaving the gold behind; this may then be dissolved in the aqua regia in the same manner as you have done before. Your plan of making chloride of gold is an excellent one; indeed, you could not have a better.

TONY.—1. Any dark backing will prevent halation. Make a mixture of Spanish brown, water, a little glycerine, and just enough gum water to give it coherence.—2. The distance between the slot and the ground-glass will be just a trifle over the true focus when used under the circumstances mentioned.

COL. GUBBINS writes: "Will you kindly tell me the cause of diluted ammonia becoming milky? I diluted a bottle of liq. amm. fortiss. with three times its bulk of water from the rain water pump; in a short time it got quite milky, and in a day or two was quite clear, with a white deposit at the bottom of the bottle."—The turbidity and precipitate is caused by some impurity in the water, the nature of which it is impossible to say accurately without an analysis. Probably alumina was present. It will do no harm practically. Few persons use distilled water for diluting the ammonia for photographic purposes.

H. N. BATES writes as follows: "Could you tell me in your 'Answers to Correspondents' if, in the United Kingdom, there are any artists, true artists I mean, who have a photographic studio as well as their own art. By artists I do not mean ordinary photographers, but men who have studied under good masters and in the best Continental or London schools of art. I ask this question as art in portrait as well as landscape photography in the United Kingdom is especially and unfortunately grossly neglected. One sees nothing but the common photographs everywhere, in the largest to the smallest city, exceptions to the rule being extremely rare. Trusting you can give a little information on the matter."—Many photographers have studied art, though many have not. The best reply we can give our correspondent is to visit some of the photographic exhibitions and judge for himself.

S. STEPHENS asks: "1. Is acetate of soda put in the toning bath to neutralise the gold; or what is its use in the bath?—2. Which is the best way to vignette in the camera? I have tried cutting a cardboard vignette but get hard margin, or not the proper size for the head or shoulders. Are there any vignettes made for the purpose?—3. What is the cause of the discolouring of the sulphite of soda for developing. Formula I use: Bromide of ammonia, six hundred grains; pyro, one ounce; saturated solution of sulphite of soda, six ounces; nitric acid, one drachm. The above developer, after a few days' standing, turns a light ruby colour."—In reply: 1. Yes.—2. The mask must be placed sufficiently far from the plate to produce the necessary softness. It is a good plan to keep the mask moving backwards and forwards during exposure. A very simple mechanical contrivance will enable this to be done. Or the mask may be placed between the object to be photographed and the lens. No special masks are made for this purpose.—3. A slight oxidation, but it will do no harm.

P. P., writing from a certain provincial town, says: "Some time ago I engaged an agent in London to forward to me goods, mostly photographic lenses, cameras, &c., insured for 100l. They arrived here, at a branch office of the agent, but were grossly damaged, and, consequently, I declined to take them in this state, and claimed as a compensation a sum of 45l. At the County Court it was alleged that the railway company was responsible, and not the agent; and I was ordered to pay to the latter his claim for transit and costs, together 15l. 15s. 6d., by monthly instalments. After this decision by the Court I demanded of the agent to deliver the goods, but this he declined, keeping them as security, and telling me at the same time that I should have to pay for warehousing till the amount be paid. Now I wish to know is the agent entitled to keep the goods as security after decision of the Court, and is he also entitled to a claim for warehousing?"—In reply: Make application to the judge, and state that you have not received the goods, and ask him to rescind the order for payment until the goods have been delivered to you.

PHOTOGRAPHIC CLUB.—The annual dinner will take place on Wednesday, December 14, 1887.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday, December 15, a paper will be read by Mr. W. H. Harrison, subject, *The Lanterns and Lantern Slides of the Nineteenth Century*.

RECEIVED.—Dallmeyer's *Choice and Use of Photographic Lenses*, New Edition; *Photography Simplified*, by Mawson & Swan; *Developing Trays, &c.*, by W. Tylar; and Woodbury's *Hypo Eliminator*. These in our next.

THE JENNINGS'S FUND.—The following additional contributions have been received by Dr. Maddox, Greenbank, Park-road, Portsmouth, Southampton, and Mr. Andrew Pringle, Cromwell House, Bexley Heath, Kent:—Adolphe Schulze, 1l. 1s.; John Williams Clinch, 10s.; A. J. J., 5s.

IPSWICH SCIENTIFIC SOCIETY.—At the annual *conversazione* of this Society a large collection of photographs by Mr. W. Vick and other local artists formed prominent objects of interest. Mr. Vick added greatly to the attractions of the evening by practical demonstrations of the platinotype process. All through the evening he was surrounded by a crowd watching with eager attention as he developed photographs upon stuff. He showed how, by this process, photographic views could be transferred to d'oyleys and pincushions, and pointed out a novel method of marking stuff napkin rings by imprinting upon each the portrait of the person to whom it belongs.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1441. Vol. XXXIV.—DECEMBER 16, 1887.

THE PHOTOGRAPHIC CONVENTION OF 1888.

ALL things are progressing favourably for the meeting of British photographers which is to be held in Birmingham in the summer of 1888, and we anticipate a large and enthusiastic gathering.

A powerful local committee has been formed, with Mr. Jerome Harrison as Chairman; while the Secretaries of the Birmingham Photographic Society, Messrs. J. H. Pickard and W. Rooke, have been unceasing in their endeavours to complete in good time all the necessary arrangements. Sub-committees have been placed in charge of the Entertainment, Exhibition, and Excursion arrangements respectively.

Subject to the approval of the Council of the Convention, the meeting will commence on Monday, July 23, and terminate on Saturday, July 28.

The Masonic Hall, New-street, an admirable building in the very centre of the town, has been engaged for the purposes of the meeting, and the principal room is admirably suited for the exhibition of pictures and apparatus. It will also seat some 700 people for the evening meetings, when papers will be read and discussed, and lantern exhibitions given. It is proposed, we believe, to have a dinner on one evening during the week, and a smoking concert on another.

Numerous excursions will be arranged, which will probably include visits to Stratford-on-Avon, Warwick, Leamington, Coventry, Lichfield, Maxtoke Priory, Worcester (with a trip down the Severn on a steamer), Dudley (including the descent of a coal-pit, when the magnesium light will be set to work), the famous string of Shakespearian villages along the Avon—Bridgenorth, Evesham, &c. Several excursions will probably be arranged for each day so as to avoid crowded parties, and the difficulty will be to decide among the good things provided.

A full and descriptive programme, containing maps of the town and district, and all necessary information, will be issued in good time.

Already we hear from many parts, not only of England but also of Scotland and Ireland, of photographers who intend to make the journey to Birmingham; and, indeed, no better place, so far as centrality and convenience of access are considered, could have been chosen. The Convention will thus celebrate its third anniversary under the most favourable circumstances, and we believe that it will mark an important step in the history of photographic progress.

DRYING NEGATIVES.

JUST now, when the professional photographer wishes to utilise every moment of daylight for printing purposes, in the endeavour, as best he can, to satisfy the clamour for photographs for Christmas, one of the most harassing accompaniments of the season is the stock of negatives on the drying racks which will not dry in any reasonable time, and which, during the continuation of weather such as we often have in the winter months, will retain a considerable amount of moisture after even twenty-four hours exposure to the air. This loss of time is serious, for we gather from our professional friends that near Christmas orders are given which become cancelled if not finished by that day. We do not now refer to the usual photographic Christmas cards of the stationers' shops, the orders for these being, as is well known, given in spring or summer for the ensuing season; we more particularly allude to the *cartes*, the cabinets, the panels, &c., that so often do duty as Christmas cards, and which, with a little effort, might, and with great advantage to the photographer, still further be made to take the place of the meaningless prettinesses of cards whose day is already almost past.

The professional photographer in a large way of business can afford to have warm drying rooms and plenty of airy space, though during strongly marked hygrometric conditions of the atmosphere the drying will even then still be slow; but those in a smaller way cannot afford the convenience and have not often the space. Where great speed in an important object, the plan often described by us of soaking the negative in methylated spirit and then placing to dry is the most effective of all, but it entails a considerable expenditure of spirit, as the same liquid cannot be often utilised for the purpose, on account of the water it absorbs from the film. It must be remembered that some brands of plates when submitted to this treatment give a peculiar opalescence after drying, which renders the negative quite unfit for printing from; if such an appearance be met with it may be removed by soaking in water afresh, but the time is lost.

We may, perhaps, point out that the cause of slow drying is not alone low temperature, it is the presence of a larger proportion of watery vapour in the atmosphere in winter, so that evaporation, in consequence, scarcely takes place at all; indeed, there are days when actual precipitation of water happens. It naturally follows that, if the moisture can be removed from the air, evaporation from the negative would take place much more freely, more, indeed, than would often happen with the normal

atmosphere raised in temperature. To attain this end, many photographers have adopted the method of placing their negatives in drying boxes or cupboards containing a desiccating agent, and the plan is thoroughly effectual, and has much in its favour. The three agents oftenest recommended for the purpose are sulphuric acid, caustic potash, and chloride of calcium. The first named is only fit for use in the hands of the practised chemist—it is too dangerous a substance to lie about a photographic dark room; otherwise, it is cheap and effectual. Fused potash is useful, but needlessly expensive while there is available chloride of calcium, which is a most excellent moisture absorber, cheap, and above all can, when “spent,” be readily made equal to a fresh sample by simply heating on a shovel over a fire. The moisture is driven off, and again the fused salt is rendered greedily absorbent of moisture.

We have lately had the whole subject brought before us by several of our correspondents, the majority of the plans submitted to us by whom consisted in stacking the negatives with free air space between them, and then, by one means or another, causing a circulation of air. If the plates are placed in racks side by side, as in the old draining racks, an artificially produced current of air becomes a necessity unless the atmosphere is unusually dry and warm.

Mr. Werge in his contribution to our ALMANAC gives a remarkable example of a danger that may attend the slow drying of negatives so placed. An instance was brought under his notice in which he was able to trace the production of certain peculiar transparent patches in the centres of some negatives to their having been placed to dry in this manner. They had not, as we are afraid is too often the case, been sufficiently washed, and the centres of the plates, naturally, when so stacked remaining longest moist, the hypo solution had full opportunity to act as it is known to do when allowed to remain on a plate exposed to the air, that is to say, it reduces it. In a contrary direction the use of methylated spirit is by some said to impart density.

Most of our correspondents' plans consisting, as we say, in the production of an air current round or through stacked plates, we may give our readers the benefit of some of their suggestions in their incomplete and untried state.

One gentleman proposed to attach an indiarubber hose to the exit end of the siphon of his washing tank after the negatives had been subjected to the action of the water for a sufficient length of time, and to attach this hose to some apparatus for producing a current. Given this current apparatus, the method seems to us the most feasible of any, and one entailing little expense.

Another would make use of the falling power of the waste washing waters to actuate a small vane or water wheel, which should produce a current to be directed upon the plates in a manner somewhat after the idea of one gentleman who believed that sufficient head of water would be found in most studios to work a small turbine, which could, by exhaust or direct action, produce any current likely to be needed, and, at the same time, provide power for sundry other minor purposes. The merit of this plan would be that the machine could be worked efficiently by the same water that was needed for ordinary photographic use, the quantity so used being quite sufficient for the purpose, and it might be run into a tank ready for producing power instead of direct to the sink.

Probably the method of easiest general adoption would be the usual one of the chemical laboratories, the production of a

current by a gas flame enclosed in a chimney, which might in this case be connected with the cupboard or drying box in which the negatives were placed. These are somewhat costly to make, hence the idea of the washing trough with the indiarubber hose attached to such a chimney seemed to us to possess the germs of real utility. We trust some one of our readers may put it to the test. It is obvious that arrangements for emptying out the last drop of water from the trough should be made or there would be great waste of power.

We have not touched upon the use of heated air in this connexion, though there is no doubt it is far more easy of successful adoption than in the drying cupboard of the plate maker, frilling plates being so liable to be produced if this method of drying be adopted by him. It is evident that the temperature which a plate will withstand without injury will vary according to the brand employed. We have some experiments in hand upon this branch of the subject, and when they are completed our readers shall have the benefit of the conclusions obtained.

HOME-MADE STRIPPING FILMS.

HAVING shortly described the preparation of the gelatine transfer paper, we now proceed to speak of its various applications and uses. We have already mentioned the very practical use the late Mr. W. B. Woodbury put gelatinised paper to on the occasion of a lengthened tour in Italy for the benefit of his health when necessarily he could not burden himself with a vast amount of luggage. Nevertheless, he brought home with him a series of upwards of 200 negatives, $7\frac{1}{4} \times 4\frac{1}{2}$, which formed, perhaps, the most perfect collection of collodion emulsion pictures taken up to the present time.

Mr. Woodbury's method was as follows. Provided with a stock of emulsion, a couple of dozen plates, and all necessary developing materials, he cleaned and coated in the bedroom of his hotel or lodging one dozen of the glasses and placed them in the slides for use. After a day's work a sufficient number of fresh plates were coated to replace those exposed, and the latter were developed, fixed, washed, and squeezed into contact with sheets of the prepared transfer paper and reared up in any convenient place to dry, which they would do thoroughly before morning. Each negative was then stripped from its glass support and stored away in a portfolio, the glass being set at liberty to be cleaned and recoated. In this manner, though encumbered with no more than a couple of dozen plates, the ingenious artist possessed practically unlimited resources for the production of any number of pictures, his bottle of emulsion being renewable at a few days' notice by writing to England.

It was suggested at the time that the experiment was a risky one, and many old collodion “hands” expressed the opinion that after developing a good negative they would rather be troubled with the weight of the glass than jeopardise the safety of the picture by stripping it. That such fears are entirely unfounded is abundantly proved by Mr. Woodbury's success, and, indeed, so readily do the films strip, even when the glass is not previously waxed or French chalked, that we should have little hesitation in “attacking” negatives that have been in existence many years. Only one precaution is absolutely necessary, namely, to allow the transfer paper to become *thoroughly dry* before attempting to strip it, and also to observe that no heat is used to hasten the operation. Heat will do little harm *after* desiccation, but if applied before the gelatine has a tendency to melt and, penetrating the collodion

film, cement it firmly to the glass. Occasionally when very dry the film will exhibit a disinclination to leave the plate; in such cases, if it be left in a damp place for a short time, or be pressed in contact with a pad of very slightly moist blotting paper for a few minutes, or even if it be strongly breathed upon, the film will separate readily enough.

The negatives at this stage may be treated with wax or vaseline and used as paper negatives, when if a suitable paper has been used they will give as satisfactory prints as any other form of translucent *éché*. Or they may be retransferred to glass on the return home of the traveller, or converted into transparent "film negatives" printable from either side.

To perform the retransfer to glass, a plate of the latter material is cleaned and coated with a thin solution of indiarubber in benzole, or, better still, chloroform, and while the film of indiarubber is still "tacky" the collodion side of the stripped negative is squeezed into intimate contact and set aside to become thoroughly dry. Or, and for many reasons we prefer this plan, a fifteen to twenty-grain solution of gelatine, to each ounce of which a quarter of a grain of chrome alum has been added, is substituted for the rubber solution. In this case the glass plate is warmed and coated with the gelatine solution in the same manner as collodion, the surplus being drained off so as to leave an extremely thin and even film, which is then allowed to dry. When the retransfer is to be made, the negative as well as the prepared glass are soaked in cold water for a minute or two, squeezed into contact, and placed under gentle pressure for ten minutes; if the glass be then immersed in warm water the paper will come away, and after rinsing the collodion surface to remove all traces of gelatine the negative is ready for drying and varnishing. When indiarubber is used, the plate must be immersed in cold water for some minutes before using hot, or the paper will not strip evenly.

For making transparent or "film" negatives no better plan exists than to apply a thick coating of insoluble gelatine to the collodion surface, and after drying to remove the paper as before. This may be applied in a liquid form or in the more modern style as an insoluble sheet, the former being cheaper and more convenient though it takes longer. Prepare a solution of gelatine as follows:—

Gelatine (white)	1 ounce.
Glycerine	1½ drachm.
Water	6 ounces.

Dissolve the gelatine, and filter carefully. Prepare a separate solution of chrome alum, two grains in one ounce of water. Brush over the collodion side of the negative with a thin solution of indiarubber, about five grains to the ounce of solvent, and allow it to dry; this is not absolutely necessary, but it helps to waterproof the collodion film and so lessens the chance of the chrome alum penetrating to the layer of soluble gelatine. Next, turn up the edges of the negative to the depth of an eighth of an inch to form a sort of dish, and lay this ready upon a levelled and warmed glass plate. Have the two solutions of gelatine and chrome alum heated to a temperature of about 140° or 150° Fahr., and just before using mix them by stirring the chrome alum carefully into the other without creating unnecessary bubbles; let the mixture rest a little for any bubbles to separate, but carefully keeping up the temperature.

When the mixed gelatine solution is ready for use, pour it into the dish formed by the negative to the depth of a sixteenth of an inch or more and allow it to set, after which the whole may be hung up to dry in a current of air. No more of the chrome gelatine solution should be mixed than it is in-

tended to use up, as when it once sets it will not reliquesfy. The thick layer of gelatine will take some time to dry, perhaps from twenty-four to forty-eight hours or longer, in a moisture-laden atmosphere; when that occurs it is coated with a film of good enamel collodion, after which the negative is floated for three or four minutes, paper support downwards, upon cold water to soften the soluble gelatine. Then, laying paper side upwards on a sheet of clean blotting paper, go over the back with a sponge and hot water until the paper becomes quite loosened, when it is lifted by one corner and gently stripped away. The collodion surface is next gently washed with warm water to remove all the gelatine, a soft camel-hair brush being used if needful, and finally placed between folds of blotting paper to dry under pressure. When dry it presents the appearance of a thin transparent film of great toughness and flexibility—little liable to injury from any ordinary causes, and is capable of being printed from either side.

The description of the various operations may seem tedious, and the process a troublesome one, but in practice it is really not so formidable as it seems, the various advantages being taken into account. We treated some experimental negatives in this manner upwards of ten years ago, and for several subsequent years they knocked about in all sorts of odd places without apparently suffering much injury.

Such is what we may call the "transfer process," involving the employment of glass plates in the field. If, however, it be desired to dispense altogether with glass when travelling, the method becomes even simpler, for it is only necessary to apply the emulsion direct to the gelatinised paper in the first instance. This perhaps requires a little more skill than coating glass, at any rate at first, but with a fair amount of care and intelligence becomes easy enough even when large sizes are required. The chief *desideratum* is to have the transfer paper itself in a proper condition, and the following hints will probably assist in securing this.

When newly coated and dried, if the proportions of gelatine and sugar or glycerine have been suitable, and the coating and drying properly performed, the paper will be soft and pliable, and entirely devoid of any tendency to "crinkle" or curl into unmanageable rolls, though it will in all probability not lie perfectly flat. To make it do this, smooth the sheets out as well as possible with the hands, and place them in a pile under pressure between the leaves of a book in a large printing frame or in an ordinary screw copying press. A few hours of this treatment will take all or most of the "curl" out of the sheets, but should any remain a moderately warm but not hot iron may be passed over the back of each, a sheet of clean paper intervening. This will bring them to a condition for collodionising.

To coat with emulsion, the sheets, cut to convenient sizes, are pinned to a thin, flat board, a trifle smaller than the sheets, one corner of the paper—that at which the surplus is to be poured off—projecting well over the edge of the board. All four edges should be *slightly* clear of the board in order that the emulsion may not creep to the under side of the paper, say, about an eighth of an inch for the two sides and a quarter or three-eighths for the other two. A very handy arrangement where a practice is made of coating paper consists of a light board, suitably tongued and grooved, or otherwise clamped, to a perfectly plane condition, and provided with a projecting handle on the under side, after the style of a bricklayer's mortar board. This renders the coating of paper as easy as that of glass.

The emulsion is applied in precisely the same manner as to glass, and upon properly gelatinised paper flows with equal readiness. When the excess has drained off, and the film been duly "rocked" until "set," the coated sheet is detached from the coating board and pinned up to dry, which it will do in a few minutes.

It is far easier to coat a surface fifteen or sixteen inches square with collodion than with gelatine emulsion; hence there is no advantage in coating very small sheets separately, especially as the cut edges are free from any tendency to frill or detach themselves from the support, as in the case of gelatine upon glass. The size of the sheets should, therefore, be arranged accordingly, allowing a small margin for the pinholes caused in attaching the paper to the coating board and other defects at the edges. In this manner the cut sizes may be obtained absolutely perfect to the extreme margin.

This now forms a true "stripping" film to be used with any of the numerous forms of "film carrier," or it is possible that some arrangement might be made to adapt the sheets for use in some of the roll holders. After exposure and development, the negatives may be treated in one or other of the ways already described, only bearing in mind that if transferred to glass the image will be reversed. Perhaps the favourite plan for modern use will be to select a proper sample of paper, and to gelatinise it with a view to its remaining as the final support, or to utilise the flexible "strippers" when they become a recognised article of commerce.

We have described the various methods of manipulating the paper in connexion with collodion, and may finish by alluding to one or two applications which will readily present themselves. First, where reversed negatives are required for any special purpose, the gelatinised paper affords one of the simplest of methods. The negative is taken upon the coated paper, developed, and directly transferred to glass, or, if made into a "pellicular" negative will print either way.

For cloud negatives, too, the gelatine paper will be found particularly handy, whether the original negatives be taken upon glass plates or upon the flexible films, or whether the latter be utilised merely for copying and reproducing the originals. Finally, for composition or double printing, pellicular negatives made in this manner from the separate originals may be superposed in correct position, cut out with a pair of sharp scissors, and the selected portion from each duly mounted upon glass to form a combined negative. Other minor uses will, no doubt, be found.

The treatment in connexion with gelatine emulsion and plates is essentially different, and will form the subject of a separate article.

THE Copyright Convention, to which we have on several previous occasions directed attention, and which was finally concluded in September last, came into operation last week. Great Britain is a member of the Union, and an order in Council has just been issued reciting the provisions of the Convention entered into between this country, France, Germany, Spain, Italy, Belgium, Switzerland, Hayti, and Tunis. The effect of this instrument is to remove the disabilities inflicted on artists or authors in one country by priority of publication in another—a very important matter to photographers.

ONE clause of this international agreement is that "Authors of any of the countries in the union, or their lawful representatives, shall enjoy in the other countries for their works, whether published in those countries or unpublished, the rights which the respective laws do now, or may hereafter, grant to natives." The literary and artistic

works protected include books, pamphlets, dramatic works, music, paintings, sculptures, engravings, photographs, designs, lithographs, sketches, and, indeed, almost everything that can be classed under the head of "publication," and by any process of production. The agreement is most stringently worded, and we have little doubt that it will put a great check upon, if not an entire stop to, the wholesale piracy of English photographs which has hitherto been so extensively practised on certain parts of the Continent.

THE Board of Customs have just issued their regulations under the Fraudulent Trade Marks Act of last session, which are to come into force on the first day of next year. By Section 16 it is provided that, "All goods of foreign manufacture bearing any name or trade mark being, or purporting to be the name or trade mark of any manufacturer, dealer, or trader, in the United Kingdom, unless such name or trade mark be accompanied by definite indication of the country in which such goods were made or produced, shall be prohibited from being imported." From this it appears that the authorities intend taking active steps towards putting this important Act—as regards the importation of foreign goods bearing English names—into operation, so far at least as the Customs are concerned.

ENGLISH dealers who supply foreign lenses bearing their names, do not, as a rule, have the names engraved upon the mounts abroad, but have them put on here; the same with chemicals, paper, &c. These things come over with the manufacturers' labels on, which are frequently afterwards removed, and those of the dealers substituted. Of course the Customs' authorities can take no cognisance of this. One thing in connexion with this subject occurs to us: How will it be with photographic mounts? A very large proportion of those now used in this country are made and printed on the Continent, and, of course, they bear the name and address of the photographer who is to use them, and often, in addition, the name of the dealer who supplies them to him. When this is the case in the future, we surmise they will be arrested at the Custom House, and become forfeited, unless there is a distinct intimation upon each card that it was produced abroad. But if the mounts only bear the photographer's name and address, will they pass unchallenged without the intimation that they were manufactured in some other country?

AT a meeting of the Society of Arts last week, a paper on the subject of eggs was read by Mr. P. L. Simmonds, F.L.S.—and a very interesting paper it was. A large proportion of those attending the meeting had no idea as to the purposes to which eggs are put and the extent they are utilised in the industrial arts. They are used most extensively, and there is no real substitute for them, in calico printing, in clarifying wines, in gilding, in bookbinding, in dressing leather for bookbinders, and also for gloves. Our readers will not require to be told that they are extensively employed in photography. Mr. Simmonds mentioned that one establishment alone consumed two millions every year in the preparation of photographic papers. It may not be generally known that most of the egg merchants now break eggs for the purpose of supplying those who require only the whites, and those who use only the yolks; thus a great saving to the consumers is effected. Whites of eggs can now be purchased by the gallon, so can the yolks. It is usually imagined that the pastrycooks are the largest consumers of the latter; this, however, is not the case; the major portion of the yolks are used up by the dressers of leather for gloves. It was the late Mr. J. A. Spencer, we believe, who first introduced to the egg merchants the system of parting the whites from the yolks, and selling them separately to those who required the one and had no use for the other.

ALREADY we have had ample evidence in most parts of the kingdom that winter is at hand. Winter, apart from the lack of business, brings many inconveniences to the professional photographer, not the least of which is that pertaining to the water supply. To be "frozen out" of water, or to have burst pipes, particularly at the upper portion of the premises, is a serious annoyance in business. However, these annoyances may be averted if timely precautions be taken, or at least they may be reduced to a minimum; but, usually,

they are neglected until it is too late. If all the water pipes which are at all exposed are covered with three or four thicknesses of old felt carpet, and if out of doors this covering be supplemented with a few inches of stable manure, they will rarely be frozen, even in the severest winter. It is a good plan to shut the water off at the main on frosty nights, if care be taken that no water remains in the pipes by drawing it off at the lowest exits. To prevent the pipes freezing from the tank to the taps, the supply pipe from the cistern should be plugged up at night with a piece of metal tube long enough to reach above the surface of the water, and the pipe emptied by opening all the lower taps. In the morning the tube may be removed, for there is little fear of the pipes freezing when the water is constantly being used.

It is a popular belief that water pipes burst when they thaw; but this is an error, as the bursting is caused by the expansion of the water as it congeals, though the effect is not made manifest until the ice thaws. Therefore, whenever a pipe gets frozen, it should be carefully examined through its entire length, and if a fracture has occurred it can easily be discovered, and the evil averted by the plumber before the water thaws again and floods the place. In nine cases out of ten the inconvenience arising from frozen pipes may be avoided by a few precautions, if they are taken in time. No time should now be lost by those who have not already taken care of their water supply for the next two or three months, bearing in mind the old maxim, "Prevention is better than cure."

PROFESSOR FORÉL is still continuing his researches as to the light-resisting power of water, his trials being made in the beautifully limpid contents of the Lake of Geneva. His method of procedure is to submerge chloride of silver papers at intervals of every ten metres, after sunset, and then to take them up at night after a day's exposure. Each piece of sensitive paper is attached at intervals of ten metres, and under suitable precautions, to a long rope. It was found that the depths where absolute darkness, or stoppage of actinic rays, was observed, varied according to the month. Strange to say, March allowed the light to penetrate the greatest distance—one hundred metres—while May and July respectively arrested it at the depths of seventy-five and forty-five respectively. It is evident, therefore, upon correlating this experiment with others on record, that the results obtained must be a measure, not of the intensity of the light in the months named, but of the turbidity of the water. However, Professor ForéL intends to continue these experiments every two months for the space of a year.

At the same meeting some photographs taken at Greenwich with the Sheepshanks's equatorial on curved plates were exhibited. The object in taking these negatives was to ascertain the limit of the possible field for correct measurement. The general result arrived at was that negatives embracing a field of four degrees in diameter might be used where extreme accuracy was needed, but that approximately accurate readings might be obtained with a field of five degrees.

ONE great advantage of photographic over eye observations is that the personal element is, or may be, entirely eliminated. So important a factor is this, that at the same meeting a description was given of a machine devised by the Astronomer Royal for ascertaining the "personal equation," as it is termed, of those engaged in the work of the observatory. A table was also given of the errors made by each observer as shown by this apparatus, and which necessitated an equivalent correction being made to each individual record.

VERGARA FILMS.

WE are much pleased to find that, after much time spent in experimenting upon the preparation of negative films which should fulfil every requirement, Mr. Vergara has at length scored a success of a genuine nature.

For a long time, as our readers are aware, this gentleman has been indefatigable in his endeavours to substitute transparent paper for glass as a support for the negative film, and although success of a certain kind was achieved, yet were there always little, and at first sight

seemingly unimportant, things which prevented such success from being of an unequivocal nature. This led to his entirely discarding the basis formerly employed (paper rendered translucent by varnishes) and substituting instead a film of a gelatinous preparation, so altered in its nature that, while retaining its transparency and flexibility, it is yet as inert as glass in the presence of water and the chemicals requisite for developing and fixing.

The other day Mr. Vergara called on us, and submitted a large number of negatives taken on his new films, also showing us the supports previous to and after being coated with the sensitive emulsion. Proceeding to the dark room now connected with this office, a 10×8 film exposed that morning was developed with singular ease and unmistakable success. Transferred from the dark slide to the developing dish, it was first treated with water to ensure a uniform wetting of the surface, after which the developer was applied. Very soon the image appeared, and went on increasing in vigour until it was judged sufficient. Fixing and washing ensued in the usual manner.

The negative was now partially dried off by squeegeeing between folds of blotting paper, after which it was wrapped round a large extemporised cylinder of porous millboard, and covered with a couple of folds of stout bibulous paper, two indiarubber bands sufficing to retain the whole in cylindrical form. For lack of a better arrangement this cylinder was placed over the gas bracket in our office, and thus gently warmed. In an incredibly brief period of time the negative was found to have become dry. The whole operation from the commencement of the development to the negative being ready for the printing frame was much less than an hour.

Pellicular negatives of the class described will prove useful in many ways. Their lightness will appeal to those who carry with them a large camera, and trudge it over hill and dale in search of pictures; their thinness will render them useful to those who for mechanical printing or "process work" require a reversed proof, for nearly equally sharp prints may be obtained from either side of the negative; while their flexibility appeals to those who have a *penchant* for roller slides, but are disinclined to strip their films from a paper support. Mr. Vergara is entitled to credit for the persistence with which he has followed the trail until he has achieved deserved success.

ECHOES FROM THE SOCIETIES.

THE question box as an institution at the meetings of our societies is unmistakably a very valuable one, enabling, as it does, retiring and bashful members to bring their queries before the Society without personal discomfort. It is a pity, therefore, that the question box should run any risk of falling into disrepute in consequence of facetious individuals endeavouring to "play larks," as somebody seems to have been doing at Derby. "Will any member give the best mode of developing and the best developer to use?" asks the question box. No wonder it was "left over until next meeting." It is a case, I expect, of *tot homines, tot sententia*.

Another conundrum, presumably from the same querist, is, "What is the action of the developer upon an exposed gelatine emulsion plate?" Now, that, to my mind, clearly depends upon circumstances. A less thoughtful man than the Secretary of the Derby Society might answer rashly, "To develop it," or "To bring out the picture." But I hold that it is not necessarily so, for the correct answer might be, "To fog it," or, again, "To show the party most closely concerned that his exposure tables are not worth a—well, the trouble he took in compiling them." I repeat that I consider the question is one impossible to answer off-hand with absolute correctness, hence, perhaps, the care with which the Secretary worded his reply. It "continued the action set up by light, and developed the latent image," he said. Mark, it is the latent image, not the plate, that is developed; but is development a continuation of the action set up by light? Some people say it is not.

But the Chairman evidently was not to be "done" by Mr. Secretary, so, in reply to another question, "Must the bromide in an emulsion be in excess of the silver salt or not?" he "hitched on to the job." After remarking that the question would be found answered in "one of the annuals," which he evidently did not, how-

ever, consider worthy of credence, he gave his own view. "If you do not get sufficient bromide in the emulsion the silver is lost, and it is the opposite if you get an excess of bromide." *Ergo*, if you use an excess of bromide you *gain* or *make* instead of *losing* silver. That is to say, from a plate maker's point of view, the more bromide and the less argent. nit. you employ the more argentum (=cash) you make. If that is Mr. Chairman's meaning, I don't think the game would last long. But perhaps he meant or said something else, and that is only what Mr. Reporter thought.

The report of the "technical exhibition," or whatever it is called, meeting of the Parent Society is interesting reading. To this meeting, from distant parts of the country, come strangers bent on seeing and hearing described the newest inventions of the year, but it seems to me that "reeds shaken by the wind" (the wind of interested exhibitors) are more to the fore. On going through the list I find that the greatest novelty, or the most important exhibit, seemed to be one which, according to the statement of a member present, was at least fourteen years old. Perhaps that is why it got a medal! Its turn had come round. These are the same old things one sees on the table year after year, including even "the only camera," &c. No wonder General Preston found cause for complaint! Why cannot the Society adhere to its own rules and refuse to allow any exhibitor, on the pretence of some paltry "improvement" (P), to bring up the same article year after year. An instantaneous shutter, which was shown there two, if not three years in succession, was said not to be made *for sale* but only *for exhibition*.

I notice a startling process brought before the members of the Bristol Camera Society by the Chairman, Dr. Arthur Richardson, who asked if any of the members had "tried the experiment of exposing a piece of plain glass in the camera to an object and developing the image by means of breathing on the same, as in the case of exposed carbon tissue." As no replies are recorded I presume it had never struck any of the members to try to dispense with films of silver bromide; they had all apparently been content to go on wasting money in silver, and gelatine, and pyro, and ammonia, and ferrous oxalate, when all that is requisite is "plain glass" and the breath of their own nostrils. Verily, we are advancing rapidly! But when was the process of developing a carbon print by breathing on it published? Perhaps Dr. Arthur Richardson will give chapter and verse.

The subject of the removal of hypo from prints arose in the discussion of a question from the box at the London and Provincial Association. Somebody of the "too literal" character wanted to know how to squeegee a print without tearing it. Such individuals should be cut off from the advantages of the question box, for surely they must either be attempting to play tricks or else their obtuseness is so great as to be hopeless. Certainly the individual in question is not likely to make much out of Mr. Ayres's straightforward and perfectly correct reply. The individual who is so fearful of tearing his prints would remove all danger, however, if he employed a piece of mackintosh cloth in the same manner as in squeegeeing a carbon print. The method of squeegeeing out the hypo solution by passing the prints through an ordinary wringing machine was published in THE BRITISH JOURNAL OF PHOTOGRAPHY over twenty years ago, as was also the plan of sponging each print singly, back and front, half a dozen times and changing into fresh water on each occasion. A simple and homely method I saw some years ago in use in a small studio in a country town seemed equally effective. The proprietor, who himself filled the various posts, from plate cleaner upwards, took his prints out in handfuls from the washing trough, "slapped" them down in a heap upon a flat board, and with a common "rolling pin" borrowed from the kitchen, and all the muscular force he could apply, rolled them nearly dry. Then, changing the water, the prints were put back to soak, turned over to separate them, and after an interval the rolling process repeated.

I have often complained of the unnecessarily diffuse and prolix manner in which secretaries of societies too frequently report perfectly familiar matters, possibly because they know all about them, while novelties are passed over almost in silence, because they want studying. As a contrast to this style of thing, I would refer to the report of a "hint" by Mr. H. N. Atkins, communicated to the Liverpool Association, on the subject of utilising the ordinary double

slides for paper negatives. The extemporised "film carrier" described by Mr. Atkins will prove of use to a large number of amateurs, and if secretaries would pay more attention to reporting such little trifles, and less to descriptions of demonstrations of commercial processes, their reports would be more readable and less like advertisements.

The question box seems to be constantly cropping up with me this week! At the London and Provincial Association a questioner wished to know how to reconcile Captain Abney's assertions with regard to the value of iodide of silver in the sensitive film with the claims made in favour of orthochromatic plates. When the anonymous questioner can show me that objects are reproduced in the camera by virtue of their *colour* alone, and without the intervention of *reflected white light*, I will tell him no reconciliation can be effected. Till then, or, at least, as long as things remain as they are, I shall side with Mr. Cobb, and prefer iodide to orthochromatic plates for landscapes.

At the same meeting Mr. W. H. Harrison stated his experience in photographing a wire rope cut clearly against the sky, and expressed himself unable to understand why backing the plate did not prevent the halation, which caused the rope to look twice as thick where it crossed some towers as where it had the sky for background. I would suggest as a reason that the defect was not halation at all in the sense usually understood, and for which alone backing the plate is a remedy, but that it arose from what Captain Abney, I think, called "lateral spread" of the image, a purely chemical effect caused by the particles of silver bromide strongly acted upon by light reacting upon adjacent particles which no light has reached. Portrait photographers know too well this defect, which shows itself by the spreading of white drapery, lace, or collars, into adjacent parts of the picture, even when they lie in the centre of the plate, where refraction is reduced to a minimum.

With regard to the responsibilities of plate makers recently discussed in these columns, I am inclined to agree with those who hold it would be practically impossible to make them responsible for plates alleged to be defective. As Mr. Ashman stated "experts" can always be brought to prove either side, and as a recent lawsuit proves when the conflicting evidence of experts becomes *too* bewildering the authorities "give it up."

That there is ample ground for complaint no one can deny, and that the responsibility of the plate maker reaches far beyond the mere value of the faulty goods supplied is equally true. But how is it to be brought home to him? Even in the extreme case quoted by Mr. Cooke in which a photographer had received plates with "all the films off the glasses" the maker could bring forward experts to prove that the result *might* be brought about by keeping the plates in a damp place, or a dry place, or a cold place, or a warm one, or as one expert more or less would not matter perhaps one might step up to support each atmospheric condition. "I would be a mighty small "might," but it *might* satisfy a non-scientific jury.

I myself received some years ago in a box of plates of my ordinary size and everyday shape one plate which differed from any I had ever seen before in having *five sides*: in other words, one corner, an area of about four square inches, had been broken off. I daresay *my* claim for compensation might have stood because the maker had not enclosed the broken piece—proof positive the breakage was his doing. Though—it has only just struck me—it would have been just as easy for him to swear that I had broken it myself and done away with the piece. Take it all round it is a difficult subject. MONITOR.

THE MAGNESIO-COTTON LIGHT.

FROM recent experiments I can testify that Dr. Piffard's discovery of the highly actinic and momentary flash of light emitted by a mixture of magnesium powder and guncotton is likely to be of great service to photographers.

In testing the light some difficulty may be found in procuring a supply of guncotton—at least of the highly nitrated or explosive variety which is best suited for the work. (The ordinary "pyroxyline" used in the manufacture of collodion answers very well, however.) The guncotton ought to be so made that when a tuft of it is laid on the palm of the hand and ignited, its conversion into gaseous products is so rapid and complete that the skin is scarcely

warmed, while not a trace of solid matter remains behind. Chemists—in this town, at all events—keep no stock of guncotton, as they say it involves them in possible trouble with the authorities, for the dynamite scare has not wholly passed away.

The preparation of guncotton is, however, so easy, that every photographer can readily prepare the article for himself. For this purpose he should purchase, say, a quarter of a pound of pure cotton-wool (price about 3s. per pound), and a couple of pounds each of strong nitric and sulphuric acids; the former costing 6d. and the latter 2d. per pound. In a well-glazed stoneware vessel capable of holding about a quart, place fifteen ounces of strong sulphuric acid, and then add gradually (stirring well) ten ounces of strong nitric acid. The mixture will make the vessel very hot, and some fumes will be given off. Cover the vessel over with a piece of glass, and place it in a dish of cold water, in which it may be left all night to cool down.

Next morning, weigh out half an ounce of cotton-wool, dry it thoroughly, pull it into half a dozen pieces, and with the aid of a stirrer made of a glass rod, immerse each piece of cotton-wool quickly and completely in the mixed acids, and leave it to soak for an hour or so. During this time the stoneware vessel should be kept as cool as possible, by changing the water in which it is immersed.

At the expiration of the time named, the cotton should be lifted out of the acids by the aid of a couple of pieces of glass rod, and placed in a small basin, where it should be well pressed, so as to free it from as much of the acids as possible. It must then be pulled out, and *quickly immersed* in a large vessel of fresh cold water; the water should be changed repeatedly—say, eight or ten times—until the acid is well washed out of the cotton, and this should be tested for with a piece of blue litmus paper, the colour of which should remain unchanged.

The cotton has now been changed from cellulose ($C_6 H_{10} O_5$) to guncotton ($C_{12} H_{14} O_4 (NO_2)_6$), a substance which contains a large reserve of oxygen gas, which it is capable of giving up to any oxidisable body brought into contact with it. If the body should have a high chemical affinity for oxygen the result of its combination with the oxygen contained in the guncotton will be the production of both heat and light.

Of the various metals, scarcely any have more affinity for oxygen than magnesium. This beautiful element has lately been much cheaper, and it can now be bought in the form of either "wire," "ribbon," or "powder," at the rate of half-a-crown per ounce, while there is every probability of the price becoming still lower.

In the form of a flat, thin ribbon, about one-eighth of an inch in width, magnesium has long been used in photography. It ignites readily at the flame of any candle, or even of an ordinary match, and yields an intensely white or violet-white light, possessing actinic power in a high degree. As it burns it unites with the oxygen of the air, forming a white powder, which is magnesium oxide ($Mg O$). Lamps have been devised to burn magnesium ribbon by Solomon and by Hart, and Lancaster sells a cylindrical reflector in the focal line of which a spiral of the ribbon is burnt. By this means magnesium has been instrumental in furnishing the means of securing many portraits at night. But the pictures so obtained which I have seen have been almost invariably "soot and whitewash," the shadows being extremely hard and black, arising from the fact that the magnesium ribbon when burning furnishes only a *point* of light of no appreciable dimensions.

It was a happy thought which led Dr. Piffard, of New York, a month or two ago to suggest the plan of mixing guncotton with magnesium powder, and then applying a light to the mass. The guncotton furnishes in abundance the oxygen needed to completely consume the magnesium, and the metal being in the state of powder can burn as a whole and simultaneously, thus spreading its flame—or rather flash—over a wide area.

A few days ago I consented, in a weak moment, to attempt to photograph a group of between forty and fifty young ladies who had undertaken, as amateurs, the performance of a certain operetta.

The only possible time came, and with it one of those gloomy December afternoons whose light was of so non-actinic a nature as to be absolutely useless for photographic purposes. What was to be done? The scenery had been specially arranged, the forty-two young

ladies had specially dressed, an indefinite number of friends were there to look on, and I dared not for a moment propose such a thing as "putting it off."

In these straits I bethought myself of what I have ventured to call the "magnesium-cotton light." Weighing out quickly a quarter of an ounce of guncotton, I dusted it over thickly with the magnesium powder and arranged it as a mass about eight inches long by two inches wide upon a piece of zinc, the edges of which were slightly turned up. The zinc plate was then laid upon a flat piece of wood, so that the hands of the person holding it should not suffer. I also provided a couple of pieces of cardboard, each measuring about four feet by three feet.

The "company" being arranged upon the stage (which was fifteen feet in width), I placed the camera in front of it, at a distance of twenty-one feet. The assistant holding the light stood on a chair about four feet to the left, and rather in front of the camera, and on either side of him other assistants held the curved pieces of cardboard which were to act as reflectors.

When all was ready the lens was uncapped (aperture $f/4$), the mixture ignited with a match, and a dazzling flame shot up, which had an apparent area of a square foot or more. The lens (Beck's rapid rectilinear, $8\frac{1}{2} \times 6\frac{1}{2}$) was instantly recapped. The plate (Thomas's whole-plate, extra rapid) developed with ease, and I send you a rough, untuned print herewith. Although the result is far from perfect, yet I consider the getting of any result at all on such a gloomy, misty December afternoon (after three p.m.) shows the new light to be a great acquisition.

I have since tried the magnesium-cotton light for portraits with good results, the roundness of modelling and the detail in the shadows being remarkable.

For single portraits, about ten grains of guncotton made into a little pad, and covered with about twice its weight of magnesium, will be found sufficient. This should be burnt at a distance of not less than seven or eight feet from the sitter. It is as well to illustrate the power of the light by making a "sham exposure" with a small quantity of the mixture, as a new sitter almost invariably closes his or her eyes the first time they are "under the light." I enclose a portrait of a young lady showing this effect, and invite editorial opinion as to "roundness" and "detail in shadows." It is an under-exposed bromide print, the only one I have at hand.*

The person holding the light should keep his head well away from the magnesium-cotton, or he may get his face scorched.

The results of the chemical combination of the ingredients used are chiefly magnesium oxide (in the form of a fine, white powder), carbonic acid gas, and nitrogen. These products, of course, mingle with the air of the room, from which the magnesium oxide slowly settles down. It will probably, therefore, be best to burn the mixture in a lamp with a ground-glass front. I hope shortly to experiment in this direction, and will let you know the results.

W. JEROME HARRISON.

P.S.—I find that a mixture of lycopodium powder and magnesium, triturated in a mortar and blown from a tube through a gas flame, yields a very brilliant and momentary flash. Lycopodium is a yellow powder (the spores of a plant) which has long been used in a similar way in theatres for producing "flashes of lightning."

WHAT TO PHOTOGRAPH.†

UNFORTUNATELY, many who admire photographs are utterly destitute of the power of refined appreciation, and the consequence is, pictures possessing this quality (that of atmosphere) in a large degree are passed by as uninteresting, and the clear, sharp, non-atmospheric photograph is regarded as everything a photograph ought to be. There has been from time to time discussions as to whether atmosphere and out-of-focus effect are synonymous. For my part I think not. I look upon atmospheric effect in a photograph to be essentially a gradual reduction in the intensity of the dark portions, the lights and shadows becoming apparently more blended as they approach the horizon till they finally merge into the sky, still retaining their individual shapes and character. This is a very different thing to the effect of blurring by reason of the distance being out of focus. This merely gives a fictitious effect,

* Quite successful.—Eds.

† Concluded from page 700.

confusing the subject and rendering light, shade, and form into an inextricable tangle of fuzziness on one plane. This sort of thing may pass occasionally, and is even better, wrong as it is, than the map-like effect of a vacuum. The value of a properly-rendered bit of distance in a subject consisting chiefly of foreground can scarcely be over estimated. That little bit of distance is certain to attract attention more than any other part of the picture; therefore, in choosing a view to photograph, include some distance if possible, for as well as the additional interest excited, it acts as a foil to the nearer objects and throws them more boldly into relief. The point of view or station point is another most important matter in making a good picture; a few feet to right or left may make all the difference between artistic and inartistic rendering. Time is therefore not thrown away by moving the camera from one point to another in order to actually see the effect on the ground-glass, and choose the most preferable position. A view directly in front of an object is seldom so satisfactory as one taken a little to right or left of it. This especially applies to buildings where a view of the front, including a perspective view of the side, is almost always the most pleasing. With landscapes, supposing the tallest trees or other objects are on one side between mid-distance and foreground, a mass of shadow, or something that will take the place of it, should be on the other side in the foreground. This direction almost always holds good whatever the subject may be, and unless some arrangement of the kind is made the picture has a lopsided look that leaves an unpleasant impression. Coast scenes are very apt to have this effect, and the mind of the photographer is often considerably exercised in getting a proper balance. A figure may be posed to gain this end; but, unfortunately, a suitable figure is not always available. Placing a bush or some broken fencing removed from near at hand is apt to have an out-of-place appearance that seems exaggerated in the photograph when the subject can be minutely examined. There is a multitude of little differences attendant on things that have occupied one position for a length of time to those newly placed there. The various vegetable growths, grass, &c., are differently disposed, and never have that pressed down appearance that we generally see as when something is recently put amongst them. It is therefore best in all cases, if possible, to select such subjects that require as little as possible of artificial help, which at best is but a makeshift.

No natural object is more useful in picture making than water, from the merest puddle to the ocean itself. A small pool in the foreground will often redeem the whole composition. Water an inch deep will have as good and sometimes a better effect than if it was a fathom, by supplying a reflecting surface not so subject to be disturbed by wind or current, although in most cases if much water enters into the composition a perfectly mirror-like surface is not the best for pictorial effect. I was about to say that it was the worst, as very often it has a blank, unmeaning impression, whereas a slowly rippling surface in which the shadows are broken up is almost the best. A surface sharply ruffled by gusts of wind is, perhaps, photographically, the worst of all, it being represented as a blank, white space with neither depth or fluidity, more like a sheet of white paper, the ripples being so small that they are practically points of light that even with the most instantaneous exposure are always unsatisfactory. If it happens that the water is perfectly still, a few stones thrown in will make a visible improvement, for as soon as there is any motion of the surface the lights and shadows get broken up, and the water looks like water, and a much better effect is secured than if the surface remains absolutely undisturbed. This mirror-like reflection seems to some to be the very perfection of water rendering, and the cheerful, contented frame of mind I have often noticed, as they have shown me of these mirror-like representations with the remark, "You can't tell which is right side up, the water is so beautifully still," as if it was some great feat to make a picture that the right way up of it required some puzzling out. It may be all very well as a conundrum but not as a picture.

I believe there is much scope for photography in the artistic representation of groups of animals or poultry, for, with the exception of geese and swans, bird life is usually taken on a very small scale. Now, a direct picture, in which two or three specimens would properly fill the plate, and taken from a very low point of sight, could scarcely help to be attractive. Of course, artistic grouping goes without saying, but there are difficulties in the way; there is, no doubt, getting sufficiently near without observation is one, although with patience and management it may be done. There are certain times in the day when most animals, &c., are drowsy, and stand or lie about without much inclination to move. These are the times to be selected, and I do not think much difficulty would be found if anyone systematically set about it.

Hungry animals are generally restless, and the necessity to search for food gives them a rapid and unceasing action exceedingly objec-

tionable from a photographer's point of view. In the majority of instances such pictures are taken without any previous preparation; therefore, perfect success is very much a matter of chance. The plan often adopted of enticing by food just at the time the photograph is to be taken is, I fancy, a mistake, and has much the same effect as trying to keep a baby still by giving it sweets or biscuits under similar circumstances; it rather adds to the trouble than otherwise, as those having much to do with very juvenile juveniles can testify, and what photographer has not had his patience sorely tried by this same! In all we photograph, I would say as parting advice, cultivate simplicity and avoid spottiness.

EDWARD DUNMORR.

RECOVERY OF SILVER RESIDUES.

SEEING the prevailing discontent on the subject of the quantity of silver allowed for in the residues sent to the refiners, it is a matter of surprise to me that photographers do not make a practice of reducing their own waste and recovering the silver therefrom, for it is a metallurgic operation of the simplest character, and a pleasing one in performance.

I will relate an early experience of my own in this matter. I assisted in burning a quantity of spoiled prints and pieces of paper of all descriptions that were even slightly stained with nitrate of silver—the accumulation of some two or three years from a photographic establishment where a large quantity of work was continually carried on. There was quite a cartload of paper, which was burnt in the open air, and kept constantly turned with a pitchfork in order to get a brisk fire with as complete combustion as possible. There remained more than half a bushel of heavy, black ash, and the problem was how to get the silver out of this. I first stirred some of the ashes in a brassfounder's plumbago crucible at a high temperature, but could not by this means succeed in materially reducing the bulk of the ashes, in which combustion had apparently already reached its limit. To attempt to flux the ashes down would be impracticable on account of the enormous quantity of flux that would be required. I then bored a hole through the side of the crucible about an inch clear of the bottom, and conveyed a piece of gas pipe from the nozzle of a forge bellows to the hole in the crucible, in which I made a fire with a few large lumps of charcoal. When this was intensely ignited by means of the blast, I shovelled in the paper ashes, slightly damped to give them some coherence. The mass rapidly settled down as the paper now readily consumed under the direct action of the blast, and as I continued to fill up the crucible I occasionally threw in a small quantity of powdered nitre to serve as a flux. In less than an hour I had burned down the whole mass, and when cold there remained at the bottom of the crucible a nugget of silver weighing several pounds. (I cannot say the exact quantity, as the operation was carried out many years ago.) There was a cake of slag over the silver, which contained numberless small spherules of metal, which might have been recovered by pulverising and washing.

In a subsequent experiment I threw in with the paper a considerable quantity of "silver mud" which was also effectively reduced.

As to the outlay, this is quite inconsiderable, the chief item being the cost of the double bellows; but a complete portable forge may now be bought for three pounds, and one blacklead pot will last for this operation for any length of time.

F. H. WENHAM.

PHOTO-MICROGRAPHY.

[A Communication to the North London Photographic Society.]

I AM afraid the subject I have been asked to bring before your notice this evening may to some lack novelty as a thrice-told tale, but as I have been invited I cheerfully respond, hoping that I may be of use to some present in suggesting and assisting them to carry out what has proved to many a fascinating branch of the photographic art.

Photo-micrography is the art of making enlarged pictures of microscopic subjects by the aid of photography—the term micro-photograph being confined to such small photographs as need a microscope to render them visible in all their details. Photo-micrography may be regarded as taking over some of the work usually performed by the camera lucida, or any other appliance by which minute detail as seen through a microscope may be delineated. Many workers prefer the camera lucida for this purpose instead of employing the photographic process, and while the disadvantages and difficulties of both are well known, all must acknowledge that none are so physically immense as in that of photographing the subject of

many microscopical preparations. Amongst the greatest obstacles to the photographic delineation of microscopical detail is that arising from the varying planes of a subject possessing any thickness. This is not of much consequence in ordinary microscopical examination, as by practice and focussing up and down the varying planes presented to the eye of the observer can be justly estimated in regard to their sequential relations, and in making a drawing of them with the camera lucida these can be brought into harmonious combination, and a fairly representative picture produced. Not so with photo-micrographic delineation; it is candidly confessed that by this process only the front plane of the object can be reproduced in accurate sharpness, each succeeding plane increasing in want of definition till the rest are lost in one entire blur. This being true of even the very thinnest objects, it follows that the thicker the subject the greater will be the difficulty of obtaining any delineation worth looking at, to say nothing of its capability of conveying a correct impression of its nature and true character. Under these conditions only the camera lucida and the trained eye and hand of a skilful draughtsman can suffice to render an adequate representation.

These difficulties arise from physical causes, and will be found connected in a greater or less degree with all microscopical objectives alike, the only mitigation being afforded by using low-power glasses, so that provided the front plane of an object seen through one of these is sharply defined, there is not much falling off in the definition of several of the succeeding planes, certainly not sufficient to be offensive to the eye, but it gradually increases till the inevitable blur occupies the most posterior. These phenomena, which the lowness of the power enables us to detect and follow with facility, occur sooner in the higher powers, so much so that that plane behind the front immediately shows a falling off in definition, and the succeeding planes rapidly degenerate in indistinctness. This obstacle may to a great extent be minimised by employing the penetrability of the low powers and getting amplification by increasing the distance between the object and the sensitive plate. This method, however, must of necessity be limited in its applicability. This art has been practised by many, both in this country and on the Continent, since photography was first discovered, and considering the advances made in optical science it is discouraging to see how appreciably small is the progress towards perfection as displayed in the photo-micrographic examples exhibited. I should like to see other objects than echinus spines and sections of wood and such like worked at—these are comparatively easy to do; but I hope that when this branch of photographic science captivates by its fascination a few more enthusiasts that an advance may be made all along the line.

The apparatus employed for the purpose of obtaining photo-micrographs has varied slightly in outward detail, and a reference to the *Journal of the Royal Microscopical Society* for June, 1887, will show by illustrations the various instruments favoured by different workers. Some employ the eye-piece, and others do not. Those using the eye-piece may get sharpness over a very circumscribed disc, but I favour the instrument without the eye-piece, as for my class of work I do not wish to be limited to size, for in exhibiting pathological and anatomical subjects it is desirable to show as much as possible of the relationship of the different parts. If you wish to confine yourself to such small and complete subjects as diatoms or bacteria taken with the highest known powers, then it is not of much consequence to do more than photograph a small portion of your subject, just sufficient to show the character of the detail, when the eye-piece may be an advantage; but if your fancy lies in the direction of photographing whole insects or large sections of a histological character, then the eye-piece becomes a hindrance and is better dispensed with. This being the principle upon which I have worked I may now call your attention to the construction of the apparatus you see before you, which has enabled me to do fairly good work without much difficulty.

Those of you who have on former occasions seen the apparatus I devised for my first work will now see that I have modified it in one respect, but in one only. You may remember in the original arrangement I employed an objective, which, being screwed into a movable brass plate, occupied somewhat of the position of a lens in an optical lantern, the object to be photographed being held in a vertical movable stage which was capable of being actuated in focussing by a long micrometer screw; this, together with my oil lamp, included in an oblong lidless box placed on its side, constituted the home-made but very efficient camera. By means of this arrangement images of microscopic objects could be projected on to a card and made available for purposes of instruction or for drawing diagrams, and, of course upon a small scale, the image projected on to a sensitive plate could be photographed. I did very satisfactory work with this form of camera, as the album on the table can testify to; but I needed some further elaboration in the direction of condensing and centering

the light when using powers higher than one-fifth of an inch. About that time I was in communication with my friend, Mr. Walmsley, of Philadelphia, who kindly sent me this photograph of the arrangement he employed. I saw its applicability to my wants, and Messrs. Beck, who had made this for him, made one for me, being about the third of this character made by them. I have substituted this for my former apparatus of vertical stage and objective, retaining every other feature of the deal box and sliding baseboard, and I find it works with the greatest comfort and satisfaction to me—being steady and free from vibration, giving plenty of light with every provision for modifying it where desirable. With this short introduction to an old friend which has lately put on a modified face, I will pass on to a brief sketch of the light employed, and say a few words on focussing and exposure.

The light employed by me is from a microscopical lamp known as Bockett's—this is more than is sufficient for all powers up to one-fifth of an inch, above that it would be desirable to have one more powerful, but so arranged as to be capable of modification, because detail and sharpness is greatly depreciated by too much light. The oil I employ is a paraffin known as Strange's crystal oil, in which I place a piece of camphor about the size of an ordinary Spanish nut to the reservoir of paraffin; this dissolves readily and imparts a more actinic colour to the light. I find in practice that a larger quantity is unnecessary, besides soon coating the inside of the chimney with a yellow deposit. It is always advisable before commencing work to wipe out the chimney with a cloth moistened with spirits of wine so as to remove this deposit, and under all circumstances to start fair each night under the same conditions, because any variation in these might throw you out in your judgment of the right exposures. A plano-convex condensing lens is necessary, and should always be used with the plane side towards the object to be photographed so as to render the light rays parallel. The lamp should be lighted and placed in the apparatus for about five minutes before beginning operations, that every part may be warmed up and subsequent expansion of the brass work be moderated, if not checked altogether.

Focussing the Object.—The light being as accurately centred as possible, the object may be arranged on the white focussing screen, and that part selected which it is desired to photograph. Being able by this arrangement of mine to see the focussing screen with the greatest ease, this selection can be made without any difficulty, and a certain amount of rough focussing can be done. The white screen can now be removed, and the glass focussing screen may be substituted. Many suggestions have been made relative to the character of this screen, as ground-glass is out of the question where fine and complicated detail has to be sharply focussed. That which commended itself to my judgment as being applicable to this purpose has been described by Mr. Walmsley after the following manner:—A sensitive plate being exposed momentarily to daylight is developed to a very slight extent, and not sufficient to give any considerable density. After washing, fixing, and drying, it is to be immersed in a bath of mercuric chloride till it is whitened. This makes a very efficient screen, but is not so satisfactory in my hands as the clear glass I use after this fashion: An old plate may be cleaned, and some fine lines, made by the very light draught of a writing diamond, may be drawn across it at short intervals, a set being also drawn at right angles to these; it is thus roughly divided into squares. This surface must always be placed next the object. To enable us in the semi-darkness of our room to distinguish this surface from the back, it is well to affix to the edges of the back some narrow strips of postage-stamp bordering, which will be sufficient to indicate the difference. The object being illuminated, and having been roughly focussed on the white screen, may now be looked at through the glass plate and focussed till its details are as clearly defined in the focussing glass as are the scratches on the plate; as these are approximately on the same plane as the gelatine film we may be satisfied that we shall get a tolerably sharp negative. If we adopt the plan first suggested for making this focussing screen, we may get the focus absolutely on the right plane if the plates are all coated to the same thickness; but the difficulty of seeing the detail of a pathological subject through even the slight opacity of such a screen is a hindrance to sharp focussing, and, therefore, does not recommend itself strongly for this purpose, but might answer for coarser detail. T. CHARTERS WHITE.

(To be continued.)

COPYING.

Your answer to "A. Z. (Worcester)," induced me to repeat the experiment I made, and which I roughly described in my article in the *JOURNAL* of 11th November under the section "Lantern Slides." My

object now was to try for both an enlargement and reduction, thus covering the copying a subject the same size. The following is the result:—

Enlargement.—Camera, $7\frac{1}{2} \times 5$; lens (Dallmeyer's wide-angle rectilinear), $7\frac{1}{4} \times 4\frac{1}{2}$, screwed inside the camera, thus reversing the lens; height of subject to be copied, 3 inches; distance of subject from front of lens, $5\frac{7}{8}$ inches; ditto of focussing screen from back of lens, $14\frac{1}{4}$ inches. *Result.*—Enlarged to $6\frac{3}{4}$ inches.

Reduction.—Camera, lens, and height of subject, the same; distance of subject from front lens, $10\frac{1}{4}$ inches; ditto of focussing screen from back of lens, 7 inches. *Result.*—Reduced to 2 inches.

I did not photograph either, not thinking it necessary. Many who have not a copying camera, or whose camera does not extend sufficiently, will find a great advantage in this arrangement. I do not claim that my measurements are mathematically correct, but they are very close, within an eighth of an inch, I believe.

GLASS STEREOGRAMS.

In renewing the binding paper on some of these, taking off the covering glass to examine, and wiping the clear glass edges, I happened to touch the print, and to my surprise found it covered with a very thin layer of a powdery nature, that came off easily by use of a piece of soft washleather without the slightest damage to the print; on the contrary, it brightened it. I suppose it to be an oxide of silver (?). This is, perhaps, worth mentioning, as there must be many of these older glass stereograms in existence, and the possessors may think them to be fading. One or two that had been thinly varnished before the covering glass was put on were all right, and so were those I have of Breezes's peculiar productions.

HYDROKINONE.

Examined by microscope, and polariscope, and micro-spectroscopically. The two samples mentioned in my last do not essentially differ under this examination. The samples contain few, if any, well-defined crystals; some portions have no defined shape, but appear as agglutinated masses; but both polarise well. If there is any approximate form it appears to be hexagonal. Micro-spectroscopically, I made the following notes: Bands of well-defined black lines running across the spectrum; spectrum bright and clean when stage of microscope removes object, showing there was no dust in the slit; lines more distinct and density increased by throwing them out of visual focus; the black lines divided at irregular intervals by open space, or spaces of the breadth of two lines, and sometimes more; there appears some slight but ill-defined absorption in the red end of spectrum. The examination was simply microscopical, and for polarisation and micro-spectroscopically. The effect of polarising through the spectroscopie is very curious.

APPARATUS.

A very useful piece can be made by buying two cheap deal dressing-tables (about 5s. each), and fastening them one on the top of the other. The under one may be with or without a drawer as may be desired, but the upper one without a drawer. If a slip of wood is nailed round the bottom of the legs of the upper one a very useful tray is formed. It is very light, and can be used either as a camera stand for indoor use, cutting a slot in the upper table to put the screw of the camera through, or it forms a good Sciopticon stand. A wooden arm with half a dozen joints holds a negative or print at any distance or angle required for copying. W. T. F. M. INGALL.

LANTERN SLIDES.

[A Communication to the Manchester Photographic Society.]

THE method of making lantern slides or transparent positive pictures on glass, to be exhibited by the projecting lantern, has occupied the attention of photographers from a very early date in the history of that branch of art and science, the first to suggest such an application to the lantern being one of our late townsmen, Mr. Dancer.

It is not my intention to wade through the history of the various processes which step by step have developed into the splendid results at the command of every lantern exhibitor of the present day, nor do I propose to state any fancy formula that is as difficult to compound and understand as it is when decocted to obtain the results foreshadowed.

The preparation of a sensitive plate that will produce all the colours of the rainbow, and a magic developer that will, without the addition of that all-important restrainer, brains, produce results of surpassing beauty, are not any part of my task to-night. Those persons who have much time at their disposal may profitably occupy a portion of

it by making lantern plates; but before doing so I would advise them to experiment first with collodio-bromide emulsion, gelatino-chloride, and gelatino-bromide, which are the leading dry plates that can be obtained from commercial houses noted for excellence of production in every respect. By doing so they will become familiar with the good and bad qualities of negatives varying in density and subject, and numerous experiences will be passed through which will be of great value later on.

After thus experimenting I would further advise the study of such books as Captain Abney's and Dr. Monekhoven's on emulsion. When you have made yourself acquainted with the instructions on coating, drying, and chemical formula, select some well-tryed method, and, without adding or taking from the one selected, make up your mind not to change until you have patiently given the one in hand a fair trial. You must not expect to find a royal road to success, or go through without failures and mistakes. These will teach you more than all your successes.

I am probably like most of you, with little time at my disposal; it is therefore of primary importance that in all these experiments the apparatus and the methods adopted must be the most convenient. In introducing to your notice the making of lantern slides, or the production of enlargements by the aid of artificial light, I do not wish it to be inferred that I prefer or advocate it in preference to daylight; but I do maintain that to me it does hold out advantages which I cannot obtain from daylight. It may be when I am at liberty the sun is not in the brightest of moods, or, if pouring forth his beams of brightness just when I have got all fixed, by the time the first exposure is made I am interrupted by some friend calling in, which puts an end to further progress, with the discouraging fact that at some future day I must start again under new conditions with regard to actinic power of the natural source of light.

It is with the object of reducing this uncertain element in the process, coupled with the convenience of being able to work any night with a standard light, that I have experimented with gas, oil, lime, and the magnesium light. After giving all these a fair trial by direct and reflected light, assisted by condensers and reflectors of various forms, I have given the preference to the magnesium light as being the most convenient, and by using a certain number of grains in proportion to density of the negatives I can depend on a certain amount of light, which cannot be said of the other systems named. Artificial light enables you to deal with defective negatives, such as those with one side of greater density than the other, caused by uneven coating, or where you have great contrast, such as thin foreground and bright distance. These effects can be considerably improved by moving the light a greater number of times over the dense portions of the negative.

For very thin negatives I prefer to use either gas or a weak-coloured orange glass, placed about one inch from the negative, and behind the ground-glass when using magnesium.

The magnesium ribbon I have found most suitable is much thicker than that usually sold, and weighs one grain to the inch in length. I cut this into lengths of two, three, and four inches, and for very thin negatives use two grains for good printing negatives, or what I call my standard three grains, and if a little above pitch, four grains; and it is only when I am dealing with very dense and unsuitable negatives for lantern slides that I use daylight.

The development of lantern plates and positive enlargements can be accomplished with either ferrous oxalate or alkaline pyro solution. The tone or colour of pictures can be modified by the addition of acids, carbonates, chlorides, and citrates of soda, potash, and magnesia. For further information, I would refer my hearers to THE BRITISH JOURNAL OF PHOTOGRAPHY, page 522, 1887, and to Swan's and Fry's lantern plate developers. The developer I shall use to-night is compounded of—

	1.	
Potassium oxalate	480 grains.	
Ammonium chloride	4 "	
Distilled water	3 ounces.	
	2.	
Ferrous sulphate	120 grains.	
Citric acid	60 "	
Distilled water	1 ounce.	

The apparatus you will have an opportunity of examining. There is nothing new about it, and, although appearing an expensive arrangement, it was cheaper than constructing a special camera, as I was already possessor of the camera, which only required mounting on the board which supports it, and allows of any amount of adjustment to various sizes of lenses and negatives for either enlargement or reduction. J. SCHOFIELD.

Our Editorial Table.

PHOTOGRAPHY SIMPLIFIED.

London: MAWSON & SWAN.

THIS is a practical treatise for the use of amateurs or professionals, and as stated on the title-page it contains useful hints to beginners on the selection of apparatus and on general practice. It is the third edition, and has been considerably revised and enlarged.

The field embraced is one of considerable extent, and it is refreshing in these days, when gelatine reigns supreme, to find a chapter devoted to the ever-useful wet collodion process, concerning which we have nothing but good to say, except in the employment by the author of that hateful and incorrect term "redeveloping solution," by which of course is meant *intensifying* solution—a term that we grant is time-honoured, but capable of being reformed. Still, the chapter on wet collodion will be welcome in these days when so few, of the many manuals, take cognisance of anything but modern processes.

For the beginner in photography the work will be found specially useful, as the different subjects, though necessarily briefly treated, go sufficiently into working details to enable any one of ordinary intelligence to grasp the subject in hand without recourse to personal tuition, a point in which most of the existing books fail, being either too technical or presupposing an acquaintance with the science which they themselves ought to impart.

Scarcely any department of photography is left untouched, and it is not necessary to say in connexion with a firm so well known in every branch of science as Messrs. Mawson & Swan that the instructions are concise, practical, and useful.

One minor fault strikes us, namely, the binding up with the other matter of a series of useful labels, which to be of use must be abstracted, and possibly injure the stability of the binding; but if these when required are carefully cut out not much harm will be done.

SUTER'S PORTRAIT APPLANAT.

MR. J. R. GOTZ, 19, Buckingham-street, Strand, has afforded us an opportunity of critically examining some of Suter's latest optical productions, especially in the domain of lenses of the aplanatic form, but having angular apertures greatly exceeding those associated with objectives of the rapid doublet class. Of these a description of two will suffice.

The larger is one of about ten inches focus, and has an aperture so great as to equal $\frac{1}{55}$, which, we need scarcely say, fits it for every class of portrait work in the studio. With the stop No. 2 of the Society's standard, the lens works with a high degree of rapidity. With smaller stops the area of sharp working, combined with depth, is increased, until at last it becomes a 12×10 objective, its short tube and the pronounced form of the lenses admirably adapting it for the transmission of a pencil of light at great obliquity to the axis. The diaphragms are placed in such a position that the projections are quite free from distortion, and the relation of each lens to the other such as to ensure freedom from a flare spot. The trade designation of the lens is the *D. Rapid Aplanat, No. 1*.

The second lens is of much smaller dimensions, having also a smaller angular aperture. It has a focus of six inches, and is intended either for detective camera purposes, or as an element in the stereoscopic camera.

We are informed by Mr. Gotz that M. Suter is indebted in no small degree for the large aperture he obtained to employing some of the recently introduced glass of Professor Abbé. As hinted above, the apertures in the diaphragms are regulated according to the standard of the Photographic Society of Great Britain. The definition is all that can be desired.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 16,576.—"Improvements in Photographic Roller Slides and Mechanism connected therewith." J. E. THORNTON.—Dated December 2, 1887.

No. 16,648.—"Improvements in Cameras." V. W. DELVES-BROUGHTON.—Dated December 3, 1887.

No. 16,719.—"Improvements in the Application of Photography to Automatic Sale and Delivery Machines, and in the Utilisation of Automatic Sale and Delivery Machinery for the Production, Sale, and Delivery of Photographs." E. J. BALL.—Dated December 5, 1887.

No. 16,987.—"Improvements in Apparatus for the Production of Oxygen and Nitrogen Gases from Atmospheric Air." E. B. ELLICE-CLARK and L. CHAPMAN.—Dated December 9, 1887.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
December 19.....	Notts.....	Institute, 9, Shakespeare-street.
" 20.....	North London.....	Myddelton Hall, Upper-st. Islington.
" 20.....	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
" 20.....	Bolton Club.....	The Studio, Chancery-lane, Bolton.
" 21.....	Manchester Club.....	
" 21.....	Hyde.....	Mechanics' Hall, Hyde.
" 21.....	Bristol and W. of Eng. Amateur	Queen's Hotel, Clifton.
" 21.....	Bury.....	
" 21.....	Edinburgh Photo. Club.....	5, St. Andrew-square.
" 21.....	Photographic Club.....	Anderton's Hotel, Fleet-street, E.C.
" 22.....	Burton-on-Trent.....	
" 22.....	London and Provincial.....	Mason's Hall, Basinghall-street.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at a meeting of the above Society, held at 5A, Pall Mall East, London, Mr. James Glaisher, F.R.S., President, occupied the chair.

The minutes of the last meeting having been read,

Mr. J. G. B. WOLLASTON said that supposing a member objected to the nomination of a candidate for membership, he wished to be informed what rule that member should follow to get the balloting for that candidate put separately.

The PRESIDENT replied that he always stated beforehand that if there were a sufficient number of black balls he would then have each candidate voted for separately.

Mr. WOLLASTON stated that he had formally objected to one of the candidates at the last meeting, and had given his protest to the Assistant Secretary before the meeting began.

The CHAIRMAN responded that the protest should have come to himself. He knew nothing about it.

Mr. E. COCKING, Assistant Secretary, said that he had not the slightest recollection of the matter.

Mr. WOLLASTON replied that he wrote his protest in ink on a piece of paper in the presence of the Assistant Secretary and then handed it to him.

Mr. COCKING responded that he had been unable to find it among his papers.

Mr. WOLLASTON added that when he found at the last meeting that candidates were, nevertheless, to be voted for *en bloc* he wrote a note to the Hon. Secretary, Mr. Donkin, on a postcard he had in his pocket, saying that there must be a mistake about such and such a name. No notice was taken thereof; he therefore thought that the persons balloted for at the last meeting were not duly elected.

Mr. W. E. DEBENHAM said that they were unduly elected because that name about which there was a protest was not taken separately.

The PRESIDENT then took a show of hands as to the signing of the minutes, and there was a large majority against their being signed.

The PRESIDENT remarked that he had never heard of a case of the kind before; if the meeting said that those minutes were not to be confirmed he would leave the chair and never enter it again.

Mr. SAMUELS said that at the last meeting the President had turned up the balloting box and said that there were no objections to the candidates whatever; if he (Mr. Samuels) had objected to any candidate he should have put in a ball on the "No" side. He submitted that it was a proper election.

The PRESIDENT added that there was no protest before the meeting and no black ball in the box; he, therefore, declared those minutes to be correct, and if the meeting said that they were not correct he replied that "they were."

Mr. WOLLASTON stated that as he had made his protest he was satisfied.

Another show of hands about signing the minutes was taken; two only voted against their being signed; they were confirmed accordingly.

The following new members were then elected:—Mr. Samuel Bourne, Miss E. Boyer Brown, Lieutenant A. H. Corrie, R.E., Mr. Horace L. Field, Miss Grumman, Messrs. Walter C. Johnson, H. Chapman Jones, Eustace H. Turner, and Alfred Werner.

The PRESIDENT announced that the retiring officers and members of Council were himself, Captain W. de W. Abney, Messrs. W. S. Bird, W. Bedford, W. Cobb, Cadell, A. Cowan, and Leon Warnerke. Nominations for the filling of the vacancies must be sent in not later than Monday, January 23. He added that at the meeting on January 10 stereoscopic appliances and work would occupy the attention of the Society, and he hoped that members would bring objects of interest in relation to the subject.

An adjourned special general meeting was then held to continue the revision of the rules of the Society.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, December 8, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. A. Cowan presided.

The CHAIRMAN exhibited a still stronger example than on a previous occasion of the positive left upon glass after fixing and then dissolving off the negative image in boiling water; the positive was so powdery that he doubted if it contained any gelatine.

Mr. A. HADDON thought the explanation to be that the pyro spent its energy in developing the blacks, therefore could not render the gelatine below them insoluble in water; in the other parts it acted with undiminished vigour, therefore the gelatine in contact with the glass beneath became insoluble and gathered there more or less silver from the rest of the image. He believed, from the amount of friction necessary to remove the positive image, small though that friction was, that the positive contained a little gelatine.

Mr. C. HEINRICH TRINKS was of opinion that it contained no gelatine.

Mr. A. MACKIE exhibited a camera devised by Major Durnford, which, he

said, could be fitted up readily in thirty seconds, could be turned easily on its side, shut into small space, and was of ingenious make.

Mr. W. M. ASHMAN said that the arrangement for turning it on its side was either a copy of Scovill's plan or Scovill's was a copy of Major Durnford's.

Mr. MACKIE replied that Major Durnford claimed no novelty in that respect. Mr. A. P. HIGGINS exhibited a camera bellows he had made of an artificial "leather cloth" costing 2s. 3d. a yard; the bellows cost him 2s. altogether for materials.

The CHAIRMAN remarked that the stuff was called "leatherette."

Mr. ASHMAN stated that a member of the Association had made a 12x10 camera out of *Times* newspapers, and was using it daily. The solid parts were made of paper pasted together; the dark slides were of the ordinary kind, bought in London.

Mr. WALLACE asked the cause of the "superficial toning" of silver prints, adding that on soaping the prints with flannel some of the colour came off on the fabric without visibly reducing the image.

Mr. TRINKS, Mr. ASHMAN, and the CHAIRMAN, expressed the opinion that by toning it was impossible to entirely substitute gold for silver in the finished print.

Mr. ASHMAN thought that the described effect might be due to dust settling on the prints while they were left about.

Mr. WALLACE responded that the colour was evidently from the print itself. Mr. ASHMAN thought Mr. Wallace to be in error.

Mr. HADDON supposed it might be finely divided gold deposited by subsidence from an old toning bath.

A question in the box asked whether the best lantern screen could be made from linen, calico, or "union."

The CHAIRMAN thought unglazed union to be the best if the screen had to be folded, otherwise glazed was the best.

Mr. TRINKS had found paper to make the best screen; the more dead-white the surface the better.

Mr. HADDON thought that a glazed surface should never be used.

Mr. W. M. AYRES liked a dead surface, slightly woolly.

Mr. C. H. COOKE exhibited some platinotype prints.

The HON. SECRETARY announced that two members of the Managing Committee, Mr. W. M. Ashman and Mr. H. M. Smith, had resigned because of approaching absence from London.

Messrs. H. M. Hastings and Edgar Clifton were then unanimously elected to fill the vacancies.

CAMERA CLUB.

On Thursday, December 8, Mr. A. PRINGLE read a paper on *Photographic Residues*. Mr. S. B. Webber was in the chair.

Previous to the reading of the paper Mr. FERRERO explained an ingenious piece of mechanism he had added to a roller slide for automatically registering the number of exposures made.

The Hon. Secretary handed round an album of Mr. J. S. Blanckensee's, containing photographs taken chiefly on the Cornish Coast.

A new print washer, invented by Mr. A. Kellar, of Cardiff, was also exhibited. In this the prints are inserted into a perforated cylinder or drum, which revolves slowly in a large trough of water, the revolution being actuated by the dropping of water from a tap upon a wheel which is attached to the cylinder. Its action was much admired.

In the course of his very practical and yet amusing lecture, Mr. PRINGLE described the best means of recovering silver from the first washing waters and cuttings of silver papers, and from hypo baths, gold from old toning solutions, and platinum from platinotype paper and platinotype developers. He also exhibited some of the apparatus employed and performed an experiment.

Mr. W. ENGLAND showed some interesting apparatus and described his methods of procedure.

The CHAIRMAN gave particulars from a record he had kept of the exact gold savings effected from his old toning baths.

The discussion was further carried on by Messrs. Welby, Hussey, Ferrero, the Hon. Secretary, and other members.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

At the meeting held on December 6 at Myddelton Hall, Islington, N., Mr. J. Traill Taylor, President, in the chair, Messrs. J. P. Mears, W. M. Ashman, and C. M. Griffiths, were elected members of the Society.

The PRESIDENT read a letter from Mr. H. M. Smith, announcing that that gentleman was leaving London, and in consequence thereof was compelled to resign his post of Hon. Secretary and Treasurer.

Mr. J. HUMPHRIES felt sure that all the members would regret losing the services of Mr. Smith as their Hon. Secretary and Treasurer. Mr. Smith had held the office of Hon. Secretary since the first institution of the Society, under the title of the North London Amateur Photographic Association, and had performed his duties with great skill and energy. It was not too much to say that the Society was indebted for its present prosperity mainly to the labours of Mr. Smith. He would, therefore, move, "That the Society, in accepting the resignation, desires to express regret at Mr. Smith's retirement and to thank him heartily for the services he has rendered."

Mr. J. OAKLEY seconded the resolution, which was unanimously carried.

Mr. SMITH, at a later period of the evening, having been informed by the President of the resolution, said he felt great sorrow at having to resign his post. He should not, however, resign his membership, and hoped from time to time, during his visits to London, to be present at the meetings. He thanked the members for the kindly way in which they had expressed their appreciation of his services and also for the assistance they had rendered him in the performance of his duties. He trusted that the spirit of friendliness which existed throughout the Society would continue, and that its present prosperity would increase.

The PRESIDENT presented a bound copy of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1888, for which he was thanked.

Mr. A. MACKIE, in exhibiting a camera, said that it was invented by Major

Durnford, whose name was well known in connexion with an ingenious little piece of apparatus known as the "Right-about-turn shutter." It was a whole-plate camera, and was remarkably light and compact, the measurements being 9 $\frac{1}{2}$ x 8 x 3 inches, all projections included. There were no loose parts of any kind, and the tripod head was part of the baseboard. The camera simply set up would allow of a variation of focus from three to nine and a half inches, but, by an exceedingly ingenious and simple arrangement, the baseboard could be extended to allow a focus up to seventeen inches. There was a novel method of obtaining both vertical and horizontal swing to the back, and also an easily and rapidly worked arrangement for setting the camera on end for upright pictures. Major Durnford claimed, Mr. Mackie said, that the camera might, when its working was understood, be brought into action in thirty seconds; but he would demonstrate that Major Durnford had modestly over-estimated the time required.

The camera was examined with great interest, and the ingenuity of its action was much appreciated.

Mr. A. P. HIGGINS showed a platinotype picture which he had soaked in aqua regia, the image, however, was but slightly reduced.

Mr. J. JACKSON passed round a print on album paper.

Mr. T. CHARTERS WHITE then delivered a most interesting lecture on *Photomicrography* [see page 792], and at its conclusion gave a practical demonstration of the method of working with his apparatus, a very good negative being produced of the tongue of a blowfly. In the discussion which ensued,

The PRESIDENT asked whether Mr. White found it necessary to make any allowance for the over correction of micro-objectives for chemical focus.

Mr. WHITE did not make any allowance, and had experienced no difficulty on that account in working with objectives up to one-fifth of an inch.

The PRESIDENT explained the construction of an apparatus by means of which stereoscopic effects might be obtained. He also stated that pictures might be obtained which could be mounted and viewed as stereoscopic slides by making two negatives illuminated by oblique light from opposite sides. Another method was to take one negative with half the objective, the other half being covered, the other negative being taken by covering the half of the objective used for the first negative. Stereoscopic effect could also be obtained by tilting the slide slightly, a second negative being obtained tilting the slide to the same degree but in the opposite direction.

Mr. WHITE, referring to the difficulty of centering the light, said that the eye of *Dytiscus marginalis*, being a group of minute lenses, required absolute accuracy in this respect, and any deviation was very apparent from the direction of the shadows. The difficulties of photographing bacteria, which Mr. Pringle had successfully overcome, arose principally in the lighting. He found it a mistake to have too strong a light, and for ordinary purposes Bockett's microscope lamp was sufficient.

Mr. HUMPHRIES said that those who felt inclined to take up this branch of work need not be deterred by the fear that the apparatus must necessarily be expensive. An ordinary two-guinea microscope would do all the work of a more expensive instrument, the only disadvantage being that a little more time must be spent and more care taken in obtaining the adjustments. To work successfully it was necessary to have some knowledge not only of the microscope but of the object, so that its distinctive features might be brought into prominence. He would recommend beginners to choose for practice a well-marked diatom, such as *Arachnoidiscus*.

The PRESIDENT said very good micro-photographs of objects not requiring high powers might be made with ordinary photographic lenses of short focus, the little combination lenses used for postage stamp portraits being quite suitable.

A hearty vote of thanks to Mr. White terminated the proceedings.

The next meeting will be held on December 20, and will be a technical meeting.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

At the last meeting of the above Society, held on December 7, at the Greyhound Hotel, Dulwich, there was a full attendance of members and many visitors. Mr. James occupied the chair.

Messrs. J. Thomson, F.R.G.S., and Herbert Starnes were elected honorary members of the Society.

It being a lantern night, no formal communication or paper was read, but several important matters of business were considered.

It having been found that Wednesday evening was inconvenient to some members, it was decided that the night of meeting be changed to Tuesday.

The present place of meeting being found to be also inconvenient to some, Messrs. Crossthwaite and Senier were deputed to ascertain if a suitable place of meeting could be obtained in Norwood-road, which was found to be the most convenient centre, and to be of easy access from West Norwood, Tulse Hill, Herne Hill, and Dulwich Stations.

Mr. J. THOMSON, who had been requested by the Society to act as Judge in the competition for the Hon. Secretary's prize, then gave his report. This prize was for the best set of six prints from negatives taken during this year. Having remarked on the high order of all the prints sent in, Mr. Thomson said that it was not without difficulty that he had decided to award the prize to "Achromatic," whose prints showed both great artistic merit and technical excellence.

The CHAIRMAN, having opened the envelope containing the name of "Achromatic," announced that Mr. Lewis Wolf was the winner of the prize.

Mr. Wolf's prints, which were handed round, consisted of two albumen, three platinum, and one bromide, and it was a subject of much comment that the bromide print, which was on Eastman's "A" paper, could not be distinguished from the three platinum prints either in tone or quality.

Mr. CROSTHWAITE announced that he would offer a prize of the value of one guinea for the best set of six lantern slides, to be sent in before the first meeting of the Society in March.

Mr. BUXTON MORRISH also announced that he would offer a prize of one guinea for the best set of six prints from negatives to be taken during the next season, and Mr. THOMSON supplemented this prize by a second of one guinea for the best single print of those sent.

Mr. W. H. WALKER, in commenting upon the work done by the Society during the year, said that it compared favourably with that done by the older and larger societies, and he congratulated the members on the interest they had shown in matters pertaining to the fundamental principles of photography, and offered a prize of one guinea for the best paper on any subject pertaining to the *technique* of photography.

The business meeting was followed by an exhibition of lantern slides contributed by members and others. Among those deserving special mention was a series of instantaneous views by Mr. Fincham, which were of exceptional quality. Some slides by Mr. Dresser were interesting from the fact that the negatives were drop shutter exposures on Eastman strippers in a defective camera, and were taken in a dull light during the month of November. A number of American slides lent by the Camera Club were much admired. In all two hundred and seventy slides were put through the lantern.

Mr. Myer was elected Chairman for the next meeting, on December 21, when a paper on *Silver Printing* will be read by the Secretary, and the Society adjourned.

A NEW SOCIETY—BARNET.

On Monday evening, the 5th instant, there was inaugurated at High Barnet a Society in connexion with the ancient Grammar School of the town under the title of "The Barnet Elizabethan Photographic Society."

A meeting was held for the purpose of bringing together present scholars, old boys, and friends, some of whom are already photographers. The Head Master, the Rev. J. Bond Lee, M.A., took the chair and efficiently directed the business of the meeting, being unanimously voted President.

A Committee was appointed to draft rules and regulations, who, supported by a substantial members' roll, will doubtless make the Society a thorough success.

Mr. T. SAMUELS sketched concisely the past and present state of the art, and the benefits arising from a union of workers, basing his remarks upon a practical experience of thirty years' standing. In his exposition he was assisted by Mr. A. MCKENZIE, who kindly put his lantern at the disposal of the young Society, and by its means were exhibited some of the possibilities of modern photography, including a fine series of micro-photographs, local objects of interest, Scandinavian views by an old boy, &c., which appeared to awaken the enthusiasm of all gathered within the medieval precincts of the quaint old dining hall.

CHESTER SOCIETY OF NATURAL SCIENCE PHOTOGRAPHIC SECTION.

The second meeting of the session was held in the Lecture Theatre, Grosvenor Museum, on Thursday, November 24, when the CHAIRMAN (Mr. E. W. Parnell, F.C.S.) delivered a lecture on *Paper Negatives and Stripping Films*.

In the course of a very interesting paper the various forms of apparatus used for holding the negatives were described, an Eastman-Walker roller slide being sent round for inspection; the exposures and various methods of development were detailed at considerable length. The films were then referred to, specimens of the earlier and the latest films being shown; the methods of using these were then demonstrated, at the close of which a large number of paper negatives, oiled and plain, films, and prints, were then sent round for examination.

A hearty vote of thanks was given to the Chairman for his interesting paper. The SECRETARY then announced particulars of the Exhibition to be held in Liverpool in March next by the Liverpool Photographic Society.

The third meeting was held in the Lecture Theatre on December 1, taking the form of an exhibition of negatives, prints, and lantern slides. A large number of plates were sent in, also prints on silver, bromide, platinotype, and Rivot's self-toning papers.

Lantern slides lent by Messrs. A. W. Beer, of Birkenhead, and P. Okell, of Bowdon, were very much admired.

There was a good attendance.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.

The ordinary meeting of the above was held in the Free Public Library, Hamilton-street, on the 8th instant.—The retiring President (Mr. J. A. Forrest) in the chair.

Messrs. J. A. Sinclair, J. L. Mackrell, W. Wilkinson, B. W. Moore, and Bardsley, were elected as members of the Association.

The annual competition prints were handed round for exhibition, including Mr. J. H. Day's prize one, for which a silver medal was awarded by the Judges, and which has been selected by the Council for enlargement up to 15×12, as the annual presentation picture, to be printed in platinotype and carbon, there being considerable difference of opinion amongst the members as to which was the most artistic and suitable process, the warm and cold tones of each having their respective admirers.

The remainder of the evening was devoted to an exhibition of slides, Mr. F. Evans manipulating his oxyhydrogen lanterns. Mr. C. B. Reader was represented by a number of scenes in Devonshire; Mr. P. Lange by a fine collection of slides from negatives on stripping films taken in the detective camera, illustrating "boat drill" on board a Cunard steamer, street scenes, &c.; the Secretary (Mr. G. A. Carruthers) by views in the north of Ireland; Mr. F. N. Eaton by scenes in North Wales printed on wet collodion plates toned with platinum. Mr. Evans had a collection of statuary lent by Mr. Archer, Liverpool. Messrs. Forrest, Lupton, Cornish, Latimer, and Mackrell, were also represented by work done in different localities.

In order to encourage members to produce good lantern slides, Mr. Evans placed at the disposal of the Council a silver and bronze medal for a competition to be held at the February meeting for the best set of four slides, all to be printed from the same negative, but each to be of a different tone, preference to be given to the set having the greatest variety of colour.

A vote of thanks to the lanternist terminated the proceedings at a late hour. From the third annual report of this Association we learn that at the close of the year 1886 the roll book showed a list of fifty-four members, twenty-four new members have joined during the current year, and there were nine resignations, &c., leaving sixty-nine members now on the books, and that the Treasurer's account shows a balance in hand to the credit of the Association of 11l. 2s. 10d.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The usual fortnightly meeting of the above Society was held in the Technical Schools, Bridge-street, on Thursday, the 8th inst.,—Mr. E. H. Jaques (Vice-President) in the chair. Sixty-four members were present.

The minutes of the last meeting were read and confirmed.

Messrs. W. T. Horton, Walter Griffiths, and R. Norris were elected as members, and Mrs. Hart and Messrs. E. Fowler, J. A. Richards, and E. Marlow nominated for election.

The HON. SECRETARY read a letter from W. Griffiths (enclosing two plates which showed the image after exposure and before development) in which he wrote the following observations:—"Having long ago observed that ordinary dry plates change colour on exposure to daylight, I lately put one or two behind negatives in ordinary printing frames and exposed them to daylight (November). A few seconds produced the image you see herewith and no amount of light after that would deepen the image; in fact, I gave one an hour and it came out just the same. It was observed at our meeting on November 10 that the phenomena frequently occurred, and was not uncommon after a long exposure or a very bright light, such as a window, was thrown upon the plate. I am inclined to think the effect can be produced at will by observing these conditions. It seems to me a question whether pure bromide of silver has the property of darkening upon exposure to light; or whether a trace of some "printing out" substance be present in the film, such as chloride of silver, which would account for the result. Gelatine probably contains sufficient common salt to produce the effect, though how it escapes elimination in the washing of the emulsion I cannot account for. I have kept some of these exposed plates about two or three weeks and the image is quite distinct now, and I expect would keep indefinitely." Discussion on the matter was postponed till such time as Mr. Griffiths would be present.

A number of exhibits were shown, notably early prints from collodio-bromide plates and instantaneous pictures, 1863 (Sayce), by W. J. Harrison, carbon prints by W. Curtis, instantaneous pictures of Buffalo Bill's company, by A. Leeson, and a very compact and useful washer made by Fell & Co., Wolverhampton, by J. F. Pickard.

The remainder of the evening was devoted to a lantern display by Mr. Charles Pumphrey, which consisted of a large number of scenes taken during a tour in the United States and Canada. He afterwards showed numerous pictures of flowers and ferns, and then exhibited the same which he had tinted and coloured by hand, much enhancing the appearance on the screen. A very effective picture was one of skeleton leaves and plants, &c.

NEWCASTLE PHOTOGRAPHIC ASSOCIATION.

At the ordinary and special meeting of the Newcastle and Northern Counties Photographic Association, which was held on the 13th instant, Mr. P. M. Laws, the Treasurer, presented a rough statement, showing that, notwithstanding the abnormal expenses for the present year, the Association was still on a sound financial basis, and only required the active co-operation of the members to place it in as good a position as ever.

After the regular business was disposed of, Mr. J. P. GIBSON, of Hexham, in the name of the members, presented Professor Herschel, the President of the Association, with a handsome album filled with photographic views contributed by the members. Mr. Gibson alluded to Professor Herschel's distinguished position and name in the scientific world and his researches appertaining to photography, and expressed the general regret at his removal from this district and the severance of his connexion with the Association, of which he has been a member from its foundation and president for three years, and for which he has worked so ardently and disinterestedly.

Professor HERSCHEL, who had been kept completely in the dark as to the testimonial, expressed his gratification at the unexpected compliment, and also his pleasure at the form which it had taken. He desired to say how much he regretted his unavoidable retirement. He wished the Society every success, and trusted he would be able to come amongst them occasionally, when he felt sure he would not be received as a stranger.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

The ordinary meeting of the above Society was held in the Society's Rooms, Masonic Hall, on Wednesday December 7,—The President, Councillor Firth, in the chair.

Mr. A. S. PLATTS then read a paper on *The Doctoring of Negatives for Printing Purposes*.

The SECRETARY showed a negative that had been varnished on the back with a matt surface, and described how simple it was to work a cloud on it with a stump and a little erayon.

A lantern-slide competition was arranged to take place on the first Tuesday in March, the first and second winning sets to become the Society's property. Mr. Shields presented his last year's winning set, also an extra half-dozen.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—On Thursday, December 22, a paper will be read by Mr. Norman Maebeth on *The Construction and Requirements of Portrait Art*.

Correspondence.

✍ Correspondents should never write on both sides of the paper.

A REVOLVING FOCUSING GLASS.—A TRANSPARENT SUPPORT FOR FILMS.—
A NEW ROLLER SLIDE.—THE AUTOCOPIST FOR PHOTOGRAPHIC PRINTING.
—A NOVEL MODE OF OBTAINING FACSIMILES.—M. BALAGNY AND HIS FILMS.
—LANTERN VIEWS.—PHOTOGRAPHIC WASTES: HOW MANAGED IN FRANCE.

M. THOUROUDE exhibited a focussing glass, which he had been using for some years to focus photo-micrographical objects. It may be remembered that in a former letter I spoke of M. Aimé Girard's idea of the focussing glass oscillating during the operation of focussing, which, in his opinion, was a great advantage. M. Thouroude thought it well to show us that this idea was not new, and that he had employed it upon a better principle. His ground-glass is in form a disc embedded in a sheet of brass. Through the centre of this disc is a hole, in which a steel axis has been fixed and centred to a point. The glass disc can now be turned by a twist of the fingers, will spin round like a boy's top, and will revolve for a length of time if the axis be well centred. The brass frame is placed upon the microscope, the rays of light pass through the hole D, and the image is designed upon that part of the disc which is over the hole D. The disc is then made to revolve, and the object focussed. This operation is much easier and truer than if a fixed ground-glass had been employed, said M. Thouroude, because the best ground-glass is formed of opaque and brilliant facets, which deviate the rays of light. When the ground-glass is not stationary, this fault is eliminated. A discussion took place as to whether the ground-glass could not be replaced altogether by means of an *oculaire* (eye-glass), as adapted to a camera by M. Vidal. M. Thouroude replied that the system of the eye-glass was excellent, but it was dangerous for the eye of the observer.

M. Alexandre Nowicki presented a new film, which I imagine to be formed of celluloid. It has all the qualities for a support for the gelatino-bromide film. It is transparent, thin, flexible, insoluble (in the developer), and can be manufactured in lengths of several yards. M. Nowicki dips this film into the gelatino-bromide of silver emulsion in such a way as to coat the two surfaces. In developing, this double coating prevents curling. A band was shown containing about twenty half-plate-size portraits. A great progress has been made, and will be a joy for amateurs having roller slides.

M. Mendoza presented a new roller slide, similar to the one I described in a former letter presented by M. Carquero. M. Mendoza has adopted a dodge of making an incision in the centre of the paper or film. When another view is required the drum is turned; at length the incision comes in contact with a lever which enters the hole, the drum continues to turn, and an indicator or hand on the side of the apparatus then shows that the film is in its proper place. This arrangement is very simple, cannot get out of order, a mistake cannot be made, and it does away with all complicated ratchet work on the roller slide.

M. Vidal, in the name of M. Raymond, Director of the Society l'Autocopiste, presented a number of fatty ink proofs, which had been obtained by a slight modification of the above apparatus. Great praise is due to M. Raymond for placing in the hands of the public a simple machine by which photographic proofs can be printed in fatty ink by using a simple press, the same as employed for taking the copy of a letter.

M. X— came forward, and said that he desired to draw the attention of the members to a communication made to them in 1882, and which had been passed over without, he believed, due attention, as nothing had been heard of experiments having been tried, &c. He placed before the members a number of negatives and positives obtained by the said process, which consists in obtaining from a negative another negative, from a positive a positive—a process of great value to photographers, to obtain a double or *facsimile* of all their negatives. This gentleman then cited the method he employed, which, he said, was first thought of by Capitaine Biny. A gelatino-bromide of silver plate is taken (whether or not it has been exposed to light is indifferent). This plate is plunged into a four per cent. solution of bichromate of potash. It is allowed to remain there to get impregnated with the potash salt, which takes about ten minutes. The plate is then allowed to dry. The plate is now exposed to light under a negative or a positive; the exposure is the same as for a phototypic plate. When the image upon the bichromated surface is sufficiently visible, the plate is taken from the printing frame and well washed in order to eliminate all the bichromate which has not combined with the gelatino-bromide of silver in the film. In a running stream of water fifteen minutes is amply sufficient. The plate is laid upon a black velvet cloth, glass uppermost, and exposed for one second to full light. The plate is then taken into the dark room, and plunged into the developing solution composed of ferrous oxalate. The development is slow but sure, and in a given time an exact *facsimile* of the *cliché* type will be obtained. Naturally the image is reversed, and consequently in a right position to be employed for fatty-ink printing. When the image is sufficiently developed, the plate is well washed and fixed in a solution of hypo-sulphite of soda. The elimination by the hypo takes more time than for an ordinary plate. The chemical action is as follows:—When the plate thus prepared is exposed to light under a negative, the blacks of the *cliché* preserve the prepared surface from the chemical action of the light, whereas the rays passing through the

whites or transparent parts of the negative render the bichromated gelatine insoluble in those parts. The insoluble gelatine therefore imprisons the silver bromide, and prevents the action of the developer. The contrary takes place on those parts protected from the light: the potash salts dissolve out, and the iron salts operating upon the silver bromide form the photographic image. When dry the plate forms a relief or mountainous appearance: the blacks form the hills and the whites the valleys; and what is to be remarked is that the blacks or hills refuse to take the printing ink, whereas it is the whites which receive it. With a little practice, said M. X—, any degree of intensity can be obtained upon such plates, and with care and intelligence an ordinary negative can be replaced by a first-class *cliché* far superior to its parent.

M. Balagny, the apostle of films, exhibited some new films which can be employed either in obtaining proofs on albumenised paper, or used to be printed from with fatty ink. This gentleman showed the members a number of proofs in fatty ink and in silver salts taken from the same negative. I believe myself that the future of photography is in this kind of preparation; that is to say, a thin film of gelatino-bromide so spread upon paper that it may be left on or taken off at will. The operator is in this case complete master of his *cliché*. He can take a proof from it when upon the paper, or he can transfer it to a glass plate, from which he can take it if he wishes to procure fatty ink proofs, or he can thicken it by doubling it with a sheet of transparent gelatine. Although this is done, I would not advise it, as I maintain it spoils its value for fatty ink or other printing which requires a reversed image. M. Balagny deserves praise for the progress he has made in photographic films. Being a man of fortune, he has devoted his whole time and much money to the advancement of photography. It is not general, such tenacity in rich men, and when we find it we must applaud.

M. Molteni, as is his wont, amused and instructed the members by a lantern exhibition, showing off the value of certain hand cameras to obtain *souvenirs* when on a tour.

Much has been said on refiners, and the unsatisfactory returns sent in by those tradesmen to those who have been, as they think, too confident in their honesty. In fact, our able Editor was obliged to write a leader on the subject, if not to defend, at least to make the supposed wolf a little whiter than he is taken for. I will now try to describe as clearly as possible how this reduction of photographic wastes is done in Paris, and give some advice to my readers, by which I hope they may for the future find good return for their money. I say with the Editor, Keep the gold and silver wastes completely apart! Mix together all chlorides and sulphides, but do not let the least particle of silver go to the refiners in the form of silver bromide; dissolve this salt out by the old hypo-sulphite of soda baths, and precipitate it by sheet zinc or into sulphide of silver. When a sufficient quantity of residues are obtained burn them down in an old iron pot until they turn to red-hot dust, pass through a fine sieve, and break up the lumps, and pick out any foreign matter, such as old glass, brass pins, &c. This is now ready to be taken to the refiners. I write the previous day to Messrs. Lyon Alemand to prepare me a crucible for such a weight of waste to be ready by nine o'clock in the morning. I take my waste to their foundry; the sample is weighed—say, eighteen pounds. I now know what I have to pay—5*l.* per pound—7*s.* 6*d.* The waste is put into the crucible in my presence, and I sit down and read my journal during the operation. The crucible and its contents are taken out of the fire, and left to cool, during which time I go to lunch. On my return the crucible is broken up and the *lingot* taken out. The silver is then put into another crucible, and melted again and poured into a *lingotière*. I pay my 7*s.* 6*d.*, and give, as is the custom, one franc to the workman in charge of the furnace. I then take the *lingot* to an assayer's, who in half an hour's time gives me on a bulletin the weight of pure silver contained in the *lingot*. A number is punched on the latter which coincides with the number on the bulletin. I have only to take the *lingot* to a banker or silver merchant, who reckons up its value, taking the exchange price of the day for pure metal as a basis. If I desire I can take the *lingot* and convert it into silver nitrate at my leisure. I have always found a gain in selling the *lingot*, and purchasing the silver salt.

59, Rue des Batignolles, Paris.

PROF. E. STEBBING.

RESIDUES AND REFINERS.

To the EDITORS.

GENTLEMEN,—I was pleased to read your article *Photographers versus Refiners*, but I can quite agree with your correspondent "Ebbw Vale" that the refiner is making a good thing of it.

I recently sent to an advertising firm one pound of mixed silver residues (sulphide, chloride, and ash) carefully collected, dried, and sifted to a fine powder free from rubbish; 7*s.* 6*d.* was allowed for this. Another refiner has on several occasions allowed for the same description of residue 19*s.* to 19*s.* 11*d.*

For two ounces and one drachm of gold residue carefully prepared, refiner allows 1*l.* 7*s.* Refiner No. 2, for same kind of residue, allowed for two ounces and two drachms 3*l.* 16*s.*

It is very uncomfortable to think that after all the dirty work and trouble of collecting these residues, it is simply to put the value into the pocket of a stranger, who also makes a charge on pretence of melting, &c.

In these hard times photographers ought really to get the full value for their residues, and not be treated like a burglar who may take plate and jewellery to be melted down.—I am, yours, &c.,
H.

December 6, 1887.

CHROMATE OF SILVER.

To the EDITORS.

GENTLEMEN,—With reference to Mr. W. K. Burton's detailed and valuable article in the ALMANAC for 1888 on *Chromate of Silver*, I would venture to draw his attention to a paper by M. Paul Roy, of Algiers, printed in *Le Moniteur* for 1881 (and reprinted in your ALMANAC for 1882, page 221), on *A Chromate of Silver Emulsion*. M. Roy bases his process on his discovery that "gelatine containing chromate of silver in emulsion coagulates in presence of an excess of alkaline bichromate." He, however, only used the red chromate as a means of getting an emulsion of a haloid silver salt by the addition to the silver chromate of alkaline bromide, iodide, or chloride. The emulsion so obtained is "of the greatest delicacy, and will pass entirely through the paper filter." Roy thought the chief advantage to be the ease with which the precipitate could be washed, as it was spongy.—I am, yours, &c.,

W. JEROME HARRISON.

Science Laboratory, Icknield-street, Birmingham.

A NEW DRUG.

To the EDITORS.

GENTLEMEN,—Permit me to draw the attention of photographers to a newly manufactured drug, which I think may possibly be found of very great value to them. It is called phospho-citric acid, and is made by Messrs. Hassall & Co., York-road, King's-cross, its principal use being for the Aerated Company's drinks. It is made only in the fluid state, as I suppose it cannot be crystallised; as every fluid ounce by measure is equal to one ounce of crystallised citric acid, it will be found very convenient to use.

Its advantages over the plain citric acid are many: first, it never turns mouldy or ropy, no matter how dilute its solution may be; then it is perfectly pure and free from contamination of lead, often found in the plain commercial acid. It is cheaper than the latter, the wholesale price being only 10d. to 1s. a-pound, so that it could be sold retail at from 1d. to 1½d. per ounce. The amount of phosphoric acid in it is very small, not quite one grain in every ten ounces—the real quantity by analysis being 1·9 grains in twenty ounces. Now, if this has no injurious effect in a developer, the phospho-citric acid ought to be a far better preservative to add to pyro than the plain acid, which always turns mouldy in solution in warm weather.

To those photographers who use temperance drinks when working in hot studios, it makes splendid lemonade, which will also assist their brain after the worry of troublesome customers; while to those who prefer a stronger drink, a little mixed in their Scotch or Irish makes a very piquant grog.—I am, yours, &c.,

FRANCIS G. ELIOT.

Kingston-hill, Norbiton.

"NEW METHOD OF ALKALINE INTENSIFICATION."

To the EDITORS.

GENTLEMEN,—If Mr. B. J. Edwards will kindly turn to the BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1880, he will see that I contributed a short article on the subject of alkaline intensification before fixation by means of a concentrated and well-restrained redeveloper, and I therefore think that Mr. Edwards has inadvertently misnamed his article in the new ALMANAC for 1888, as I am sure that he will allow I was before him in suggesting the method in question for intensification purposes.—I am, yours, &c.,

A. GIL DE TEJADA.

THE "PERFECT" PHOTOMETER.

To the EDITORS.

GENTLEMEN,—With respect to the photometer alluded to in your JOURNAL of December 9, page 779, we beg to inform you that this instrument is the invention and manufacture of J. Decouesor, of Paris, and we have had stock for sale some time; moreover, it is but a modified copy of Warnerke's actinometer, and the principle of its use is clearly pointed out by J. H. Storey and W. O. Roper in the BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1884.—We are, yours, &c.,

MARION & Co.

December 10, 1887.

WRIGHT v. WRIGHT.

To the EDITORS.

GENTLEMEN,—In your issue of the 2nd instant the report of the above case is not correct. It states "there were to be a dozen cards for 15s. 6d., but when the cards were finished the plaintiff refused to accept them, and defendant gave back 10s." &c. This is not correct—the proof only was finished, and finding it impossible to satisfy him, as he demanded to be taken again without any extra charge until he was satisfied, although the only complaint he made was because one of the children was slightly compressing the lips, I returned the 10s., deducting 5s. 6d. for the proof as I did not wish to have any further trouble with him, and thinking that

would satisfy him. Had I known it would not, I should have finished the dozen and let him sue for the whole amount.

The above correction in your next issue will greatly oblige.—I am, yours, &c.,

W. EDWARD WRIGHT.

1, Sebert-road, Forest Gate, E.

P.S.—As a matter of fact, I finished a print from another negative, finding the first did not satisfy, so that he had two proofs, and only one was charged for.

W. E. W.

ATTACHING CAMERA TO STAND.

To the EDITORS.

GENTLEMEN,—In your ALMANAC of 1888 W. H. Harrison mentions an invention for simplifying the fixing of the camera to the stand by a bayonet arrangement, but forgets the name of the inventor of the same. I have much pleasure in informing your readers that I am the inventor of the said invention, which I had the pleasure of showing at the Camera Club some time ago.—I am, yours, &c.,

J. E. BROWN.

26, Bowling-green-lane, London, December 14, 1887.

[The bayonet method of attaching a camera to the stand was in use in New York years before the Camera Club existed.—EDS.]

THE AMATEUR EXHIBITION.

To the EDITORS.

GENTLEMEN,—In your notice of our Third Annual Amateur Photographic Exhibition, you appear to be under a misapprehension, which we trust you will allow us to point out, as the remarks based upon it may tend to prejudice the value of these Exhibitions in the future. We refer to your allusion to "Artemus Ward's army, in which every man was an officer," and your statement that every exhibitor has received either a medal, a money prize, or honourable mention.

It is quite true that every exhibitor whose work is hung upon the walls has been the recipient of either a prize or commendation; but it is necessary to explain that these successful competitors form only a small proportion of the whole number of amateurs who have sent in pictures to the Exhibition, want of wall space debarring us from hanging any subjects but those selected by the Judges as being the most meritorious. This will be at once understood when we state that the total number of photographs sent for competition amounted to over 4000, out of which only 270 have been framed and hung, the remainder being on view in portfolios arranged according to their respective classes.—I am, yours, &c.,

S. CLARK, Secretary.

London Stereoscopic and Photographic Company, Limited,

December 12, 1887.

[Our statement was based upon a careful perusal of the catalogue and of the pictures on the wall. We are pleased to learn that such a degree of success has attended this Exhibition. Before we are done with it we shall also examine the rank and file in the portfolios.—EDS.]

Exchange Column.

Will exchange whole-plate portable camera, by J. B. Dancer, for good lens or offers.—Address, C. J. EMENT, Walton, near Ipswich.

Buttonhole camera, will exchange for stereoscopic lens by Ross or Dallmeyer. Difference adjusted.—Address, J. MORRISON, 73, Earl Howe-street, Leicester.

A whole-plate portrait lens, by Lerebour, and a cabinet lens, by Sawyer, will be exchanged for rapid rectilinear or doublet.—Address, W. BOND, Bank Plain, Norwich.

Wanted, 12×10 or larger-sized camera in exchange for fifty-inch bicycle (Singer's National Challenge).—Address, J. MUNRO, Deveron-villa, King-street-road, Aberdeen.

Wanted, stereoscopic camera with pair of portrait lenses in exchange for achromatic microscope and slides. Value adjusted.—Address, H. C. PARLOW, 55, St. Aldate's, Oxford.

Will exchange oil painting, size, 20×24 canvas, in gilt frame, for whole-plate portrait lens, group lens, posing chair, or other accessories.—Address, S. BAYNTON, 6, Queen-street, Coventry.

Wanted, Dallmeyer's or Ross' short focus cabinet portrait lens; exchange, Rudge's rotary tricycle, and give part cash if required.—Address, W. E. LEEK, 11, Iron-market, Newcastle, Staffordshire.

Wanted, a quarter-plate Meritote, 1887 pattern if possible. Will exchange 230 rook rifle with about one hundred cartridges and microscope magnifying thirty diameters.—Address, T. H. HALL, 42, Sutherland-square, London, S.E.

Wanted to exchange, microscope, by Dancer, with five powers, polariscope, and other accessories, in mahogany case, for half-plate camera, lens, and slides. Cash adjustment if necessary.—Address, J. G. M., 23, Hall-street, Nottingham.

12×10 Universal lens by Hunter & Sands, rolling press, plate, 14×10, whole-plate burnisher and beaks; wanted, 12×10 Ross' rapid symmetrical or Dallmeyer's 12×10 rapid rectilinear, also 12×10 burnisher.—Address, W. H. SEDGWICK, Sedburgh.

Will exchange half-plate single lens, several JOURNALS, and a Reeves's mahogany box of thirty-six water colours, for a whole-plate or larger camera or a half-plate rectilinear lens. Difference adjusted.—Address, A. G., 2, Park-place, King's-road, Windsor.

Wanted to exchange, fine compound microscope, by Dancer, of Manchester, with five powers, polariscope, and other accessories, in heavy mahogany case, for half or whole-plate camera, lens, and slides.—Address, J. G. MARTIN, Hall-street, Sherwood, Nottingham.

Wanted, whole-plate outdoor camera, quarter-plate or larger rectilinear lenses, carte or cabinet lens, detective camera, or offers, in exchange for handsome old-fashioned bronze repoussé plaques, thirty-nine inches diameter, and smaller.—Address, HEMERA, St. Leonard's-on-Sea.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

- J. Gibson, Penzance.—*Photograph of the Lizard lights at night.*
 G. A. Dean, Douglas, Isle of Man.—*Three photographs of the Bishop of Sodor and Man.*
 J. Schmidt, Belper.—*Three photographs of Hon. F. Strutt.*
 R. Watson, Hull.—*Photograph of Yorkshire County Football Team. Photograph of Durham County Football Team.*
 J. Squibb, Bridgewater.—*Photograph entitled "Convalescence."*

- F. D.—Apply direct to the Company or order through any gasfitter.
 V. C. B.—Diluted nitric acid will prove the best agent for cleaning the opal glass.
 T. BRECH.—The modified potash developer prepared as directed will suit the plate named.
 AN AMATEUR (Newcastle-on-Tyne).—We are going to treat the subject in a special article soon.
 CAPT. C. M. HARRISON.—Thanks for your note. As requested, we do not make its contents public.
 E. H. EARL.—When about to photograph by the magnesium light the focussing should be effected by gas or candlelight.
 T. PINDAR.—We have not yet come across the article, but will do so in a week or two hence, when preparing the index.
 W. S. A.—Details of the collodion transfer process are given at page 307 of the last edition of Hardwich's *Photographic Chemistry*.
 Y. Z.—I. See the shutter described in our new ALMANAC at page 499.—2. We must decline to offer an opinion relative to spirit photographs.
 HENRY WALLIS.—Replace the silvering on the damaged portion of the mirror by covering it with tinfoil upon which a little mercury is afterwards poured.
 JAMES PARIS (Fargo, Dakota).—The incandescent gas burner may be used in a lantern for enlarging purposes, but it is not sufficiently intense for an entertainment.
 A PHOTOGRAPHIC COMPANY.—We have been asked if the "Company" to which reference was made in a sub-leader in our last issue was that of R. W. Thomas & Co.; to which we reply—Certainly not.
 B. R. BRADEN.—The carbon prints springing off the support before the transfer paper is applied no doubt arises from their being allowed to become too dry. Avoid allowing the prints becoming abnormally dry.
 W. SOUTHWELL (Blackpool) sends us two excellent stereoscopic views of an interior with figures, a tribute to the information imparted by the articles on stereoscopic photography in the ALMANAC for 1887.
 ETHEL CONSTANCE MAY.—We have practically tested the production you designate "A," and can speak very highly concerning it. There is nothing to be apprehended regarding its possible perishability.
 B. S. asks: "Supposing a painting be made from a photograph before it is registered, can the painter be proceeded against after the photograph has been copyrighted?"—The painter cannot be proceeded against.
 W. GRIFFITHS.—The most powerful form of limelight burner is the mixed jet. But the light of magnesium aided by a suitable reflector will prove more convenient for illuminating the map. It is very much more actinic than the limelight.
 II. J. M.—I. In our ordinary practice with the ferrous oxalate developer we do not employ sulphite of soda.—2. See what was said at the meeting of the London and Provincial Association in our last week's issue respecting hyposulphite of soda. There are many hypo eliminators each claiming to possess special advantages. All of them are good when properly used.
 C. I. CALLOW writes: "I have heard that a camera has been patented which will photograph colours in their own tints. My impression was that even if colours could correctly be photographed it must be owing to the chemicals employed in coating the plates. I should be glad if you know of such a camera or plate."—The camera and plates alluded to belong to the photography of the future.
 PHOTO.—Acts of Parliament are sometimes inconvenient, but this cannot be helped. The Poisons Act was framed to prevent the indiscriminate sale of poisons by unqualified persons. Those you name come within the Act and can only be legally sold under certain restrictions. The shopkeeper who sells them, except in conformity with the Act, of course renders himself liable to the penalties.
 NEW CLUB (Edinburgh).—A five-inch condenser will prove rather small for a 5 x 4 negative, unless you are content with only a portion of it, say, a circle of four and a half inches diameter, or probably rather less, unless the condenser be a very fine one indeed. There is no objection to employing a thirteen-inch focus lens to produce the enlargements, irrespective altogether of the focus of that by which the negative was taken.
 T. A. W. complains that he has attempted to reduce some wastes and used the flux recommended by us some time back, and has only got the metal in a honeycombed or semi-metallic state.—The reason is that the heat was insufficient or it was not continued long enough. Our correspondent should now add a little more flux, and fuse again with more heat, and give plenty of time. When the mass is well liquefied a little borax dropped in will assist the operation.
 A. G. CORNELL.—The reticulated appearance in the film of which you complain arises from the collodion being made with solvents of insufficient strength. Methylated ether and methylated alcohol will do quite well for making collodion for enamelling prints, provided they be of the requisite strength. If the former have a specific gravity of .720 and the latter of not less than .825 they will do very well, but they ought not to be much weaker than this to give satisfactory results.

S. V. T. asks: "1. Can a photographic firm copyright a photograph as their own property if actually posed and manipulated by an operator during the time he is in their employ?—2. Would the operator have any direct or indirect interest in the photograph necessitating an assignment from him before copyrighting?"—In reply: 1. It must be registered as the production of the one by whom the picture was made.—2. If he has assigned his copyright to another he has no further claim.

J. RING (Greymouth, N.Z.).—We regret we can give you no definite information on the subject. The piece of unixed paper reached us of a deep brown colour, and the fixed piece as well as the two prints badly marked and mottled by contact with it, accelerated no doubt by damp. So much are these stained that no straight marks are discernible. If the marks were caused by the rods upon which the paper was dried we should expect that a careful examination would show them before the paper was sensitised, also that they would make their appearance more or less on every sheet. Can they be due to a slight scum upon the bath that the paper is sensitised in?

C. T. M. writes: "I have just had the misfortune to break in three clean pieces a negative of some value to me (as it is the photograph of a house now in the course of demolition and consequently cannot be reproduced) before obtaining a print from it; can you tell me of any method by which I can obtain a fairly good print from this, not showing any lines where the glass is broken?"—Bind the edges with slips of paper applied wet, so as to shrink when drying and thus hold the pieces close together; then apply a paper backing to the negative. Now take a transparency by contact printing and scrape out the markings showing the cracks; from this take another negative, or you may print on paper from the original broken negative when thus prepared.

FACILE writes: "Can you help me in the following matter? I have mounted prints in optical contact with glass and found no difficulty in making a black margin by means of Brunswick black; can you tell me any means by which a similar effect in colour can be obtained? Ordinary paint 'strikes,' and if mixed without oil, but with jappanners' gold size or turps only, it dries dead, and no gloss like the black. Would it be any use mixing the dry colour with a varnish, or would this have the same drawback as oil? If I could get at the composition of Brunswick black the road would be clearer, but no one seems able to tell me."—There are several formulæ for Brunswick black. This is a good one:—Melt two pounds of asphalt in an iron pot and add hot boiled oil one pint; mix thoroughly, and allow it to cool somewhat, then stir in two quarts of oil of turpentine. We should advise our correspondent to try the effect of mixing the dry colours with different varnishes.

T. V. writes: "I am a constant reader of your JOURNAL and have not found any mention made in it of the use of dextrine as a mountant for photographs; is there any objection to its use?—2. Could you explain the cause of the following? I pose a model, say, two feet from a vertical mirror, in order to get a full-face as well as a profile portrait with a portrait lens; in the focussing screen both figure and reflection look 'sharp,' as also does the frame of the looking-glass, and I proceed to take the portrait; when this is produced the object is well defined, so is the frame of the mirror, whereas the image on the glass is 'blurred,' as if out of focus. What is the cause of this, and what the remedy? It seems to me that the image or reflection on the mirror is not, in fact, at a greater distance than the surface, and, therefore, than the frame of the looking-glass, so if these are in focus so ought the image to be, notwithstanding the fact that this last seems not two but four feet from the sitter.—3. Are 'gelatino-chloride' plates for transparencies (or is Dr. Liesegang's gelatino-chloride paper) capable of development by ferrous oxalate developer in the same or similar manner as, say, Eastman's or Morgan's gelatino-bromide paper, after, say, two seconds' exposure to diffused daylight? In that case, given a dull November day when printing for toning bath takes six hours' exposure, only two seconds would be required to expose for development. Is this so?"—In reply: 1. Dextrine is not a good material for mounting photographs. Most commercial samples are acid, and acid mountants should always be avoided.—2. There may be two causes for the unsharpness of the reflected image, the first arising from the reflection from both surfaces of the looking-glass, and the second from the lens not possessing the requisite penetrating power, for the image is not on the surface of the mirror but as far behind it as the sitter is in front of it.—3. Gelatino-chloride plates are generally used for transparencies. The paper in question is not intended for development but for printing out. Gelatino-chloride paper suitable for development is an article of commerce.

THE JENNINGS'S FUND.—The following additional contribution has been received:—Mr. James Swift, H. Is.

A NEW SOCIETY.—A Society, "The Photographic Assistants' Club," has been formed in Glasgow, the Secretary being Mr. William Anderson, 6, Drummond-street.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, December 21, 1887, will be *The Relation of the Quality of Negatives to the Quality and Permanence of the Silver Prints*.

** The pressure on our space is so great this week that we are compelled to leave over the continuation of the Amateur Photographic Exhibition and articles by Marston Moore, W. H. Harrison, F. G. Eliot, &c.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

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HOME-MADE STRIPPING FILMS.

WE now come to the last and most difficult application of the gelatinised transfer paper, to the production of stripping films of gelatine emulsion. The greater difficulties arise in consequence of the solubility of the transfer coating in the medium, which keeps the upper layer liquid during the process of spreading, a condition which does not prevail when the latter consists of collodion, and also in the danger that exists of the chrome alum used to harden the sensitive film when dry penetrating sufficiently into the underlying gelatine to render it partially or wholly insoluble, and so defeat the object in view by permanently cementing the picture to the paper support.

These difficulties, of course, exist equally whether the work be performed on a large or a small scale, though, probably, they make themselves felt with greater force under the latter conditions, owing to the absence of systematic arrangements for combating them. On the commercial scale, and when the "films" are coated by machinery and in continuous bands, the careful adjustment of the temperature of the emulsion and of the speed of the machinery serves to render the process practically automatic, and relieves the operator of all anxiety as well as the necessity for the exercise of the most perfect combination of rapidity, accuracy, and care in manipulation, which alone serves to ensure success or failure when the work is done by hand.

Thus, on the large scale, a band of paper previously coated with an even layer of soluble gelatine is passed, tightly stretched, at a regular speed through a trough of alumed emulsion, which is kept with comparative ease at a uniform temperature, sufficient to keep it fluid without being high enough to retard its setting beyond a certain time. Thus, as the coated paper leaves the emulsion trough, the sensitive layer remains liquid during the period the band occupies in travelling a certain distance, when it sets, the back flow during the interval it remains fluid being perfectly regular, and the ultimate coating uniform in thickness. Variations in the temperature of the emulsion or of the atmosphere sufficient to modify the period of setting, and, consequently, the interval of back flow, may be compensated by altering the speed of the machinery, and thus a practically even coating is maintained for any required extent of time or surface.

While the hand operator is deprived of these aids to uniformity, and is compelled to trust to his own manual dexterity and acuteness of observation, it must be borne in mind that he is not bound to the unvarying exactitude that is indispensable on the commercial scale. Coating a single sheet at once, either by floating or otherwise, he may work in a more leisurely manner, and take time to study the varying circumstances of

temperature and fluidity of his preparation, and should any hitch occur the consequence will scarcely be so disastrous as in the case of a mishap to the coating machinery. Still, the difficulties are such as to call forth all the intelligence of the most careful worker.

He has two main points to bear in mind, namely, that the transfer surface of the temporary support is soluble (more or less) in the warm emulsion, and that the latter sets rapidly when its temperature falls below a certain point, and that it cannot be reliquefied by heat in order to equalise an uneven or imperfect coating. Thus there are two reasons why expedition and dexterity are absolutely essential, for if the sheet be floated and re-floated to secure an even coating, the chances are that the soluble gelatine will be sufficiently attacked by the warm emulsion to produce unevenness of the under side of the film; while if it be attempted to equalise the layer of emulsion by other means, there is every probability of greater irregularities arising from the premature setting of the latter. Add to this the fact that the longer the emulsion remains warm and liquid the stronger is the chance of the chrome alum diffusing itself by absorption into the layer of soluble gelatine and rendering it insoluble through a portion of its thickness. Bearing these circumstances in mind, the operator may proceed to work.

Reverting for a moment to the preparation of the transfer paper, we may repeat that when it is made for the express purpose of gelatine stripping films the coating of soluble gelatine may be thicker than for collodion purposes, in order to afford the best possible chance of at least a portion of its thickness next to the paper support remaining soluble, in case any accident should occur to cause the chrome alum to penetrate it injuriously. Again, for reasons that will be touched upon presently, it should contain a full quantity of glycerine, or other hygroscopic material, to preserve its pliability to the utmost, without injuring its keeping qualities, or causing it to exert any deleterious action upon the sensitive film to be placed in contact with it.

Beyond these small matters, there is nothing in the preparation of the transfer paper for gelatine stripping films in which it differs from that prepared for collodion, but its after condition is of far higher importance as tending to promote speed and success in the application of the coating of sensitive emulsion. When dry it must be perfectly smooth and free from wrinkles or obstinate tendency to curl. Clearly, it is impossible to float, or otherwise coat evenly with emulsion, a stiff, uneven paper surface, without first rendering it pliable by damping, which, in this case, is quite out of the question, so that every precaution should be taken in the preparation of the

paper to ensure its proper condition. It is here that the utility of the glycerine makes itself apparent, as by adding a proper quantity to the gelatine solution the coating, when dry, remains perfectly pliable, like soft leather, without exhibiting the slightest tendency to tackiness.

Paper coated with gelatine so prepared curls very slightly on drying, and if the sheets be laid one on top of another and kept under slight pressure in the flat state every appearance of unevenness will rapidly vanish, and in this state the paper is in perfect condition for coating with emulsion either by floating or any other method.

The amateur or small consumer, working upon a moderate scale and for private use, will naturally consider it to his interest to make his product as perfect as possible. That being so, we strongly recommend as an additional refinement, though not as a necessity, to coat the paper with collodion before applying the emulsion. The trouble is comparatively slight, and the result is to more completely isolate the two layers of soluble and insoluble gelatine, and so preserve the integrity of both, while the negative after stripping is already provided with a protective coating of collodion. After collodionising the paper must be again dried and placed under pressure, or it may even be necessary to roll it up, coated side outwards, in order to counteract the tendency to curl in the opposite direction.

The emulsion needs no special preparation except that a small quantity of chrome alum is to be added to it in order to render it insoluble after drying. The quantity will vary with the kind of gelatine employed, the harder kinds requiring less than the softer, and being more difficult to manipulate into the bargain, as some of them will suddenly curdle or solidify in a most unaccountable manner with even the smallest quantity of alum present. It must be remembered that the alumed gelatine sets at a higher temperature than before the alum is added, and that when it has once gelatinised it is impossible to satisfactorily relinquefy it by heating. Therefore the chrome alum in weak solution should be *stirred* into the emulsion almost at the last moment before coating, and the utmost provision made for keeping up the temperature to a proper point.

We now come to the coating of the paper with emulsion, and we shall presume that the operation is to be performed with single sheets of moderate dimensions, not necessarily cut to the exact size required for use. Sheets measuring up to from thirteen to fifteen inches in longest dimension are almost as easy to handle as smaller sizes, and give no more trouble or anxiety, while they will cut up into two, four, or more smaller ones; besides, it is easier to keep up an equable temperature with a large bulk of emulsion than with a smaller quantity.

Floating will no doubt be generally selected as the most convenient method of coating, and no doubt justly so. If the paper be in proper condition nothing is easier than to lay it down quickly and smoothly upon the surface of the emulsion without enclosing a single bubble, and to raise it again evenly and steadily is equally easy. But then comes the question of what next to do with it.

It is not safe to hang it up immediately to set and drip at the same time, as the alumed gelatine is apt to gelatinise in an irregular manner, and to run in lumps, or break away from the paper by its own weight, unless it be applied at exactly the proper temperature and under carefully considered conditions, as in machine coating. It is therefore desirable to lay it down as quickly as possible in a horizontal position to set, and if the slab or bed upon which it is laid be slightly warmed to prevent

sudden chill, the evenness of the coating will be improved. If provision can be made for keeping the emulsion liquid for some seconds or half a minute, time will be permitted for searching out and removing chance irregularities, such as air bubbles, and the delay in setting under the circumstances will do little harm to the under layer. Dry gelatine, as is well known, dissolves but slowly in hot water, where that which is already swelled liquefies almost instantly under slight warmth. In a level position, then, the slight softening of the surface of the soluble gelatine can do little harm, though in a hanging position, or if the sheet were to be much moved about, it probably would.

If a levelled hot plate be placed at the side of the coating dish, each sheet in turn may be lifted by one edge from the emulsion and drawn steadily over the edge of the plate, and then left while the next sheet is being floated, after which it may be drawn on to a cold slab on the same level to set, and make room for another.

Instead of floating, the sheets may be coated by pouring a measured quantity of emulsion on to each while laid in a horizontal position. This plan, perhaps, has advantages on a small scale, requiring less emulsion and less care in keeping up the temperature. The coating should, however, be performed on a hot plate, or the emulsion is almost certain to chill on application. One disadvantage exists, namely, the tendency of the paper to "cockle" under the combined effects of warmth and moisture, and if this occur before the emulsion has set the result is fatal. If it occur later, it matters not.

The drying of the paper presents no special features, and once dry, if kept so, there is no reason why it should not preserve its quality as long as ordinary films. If, however, there be any great delay in drying, or if the paper be subsequently stored in a damp place, there is a strong chance of the chrome alum from the layer of emulsion reaching the soluble gelatine, and so ruining its stripping properties. With expeditious drying and careful storage, however, this cannot occur.

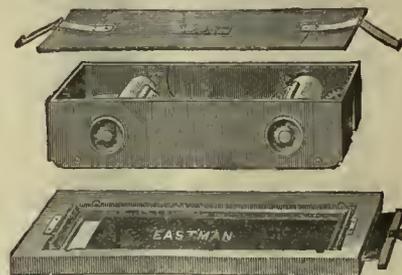
The method of using the stripping films has been already described, so nothing further need be said here on that subject.

THE GENESIS OF THE ROLLER SLIDE.

II.

RESUMING our remarks from page 689, we continue by giving a description of the latest development by the inventors of the Eastman-Walker roller slide or roll holder, being that which is now known as their 1887 model. It will be seen that it differs in several details from the original one, the construction of which is now too well known to require repetition here.

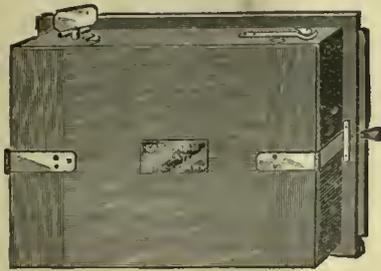
The metallic frame of the original, or 1885 model, is re-



placed by wood, light yet rigid. In this frame is fitted the various rollers and mechanism, both the back and front being detachable therefrom, as shown in the accompanying cut.

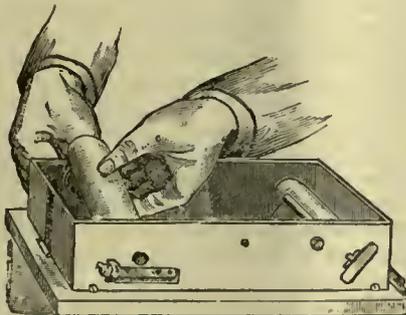
Apart from this, or rather as a consequence thereof, the key by which the rollers were rotated so as to shift the paper, and which formerly had to be removed every time access to the interior was desired, is now a fixture to its special roller and need never be disconnected. When not in use it folds down, and lies flat against the top of the roll holder.

There is also another improvement. In the first model the progress of the paper or other flexible negative material was indicated audibly by four sharp clicking sounds made during the winding, the fourth one intimating that a fresh surface had taken the place of that which had been exposed. In the new one the progress is indicated to the sense of sight, a small, unpretentious, and simple, yet surely working piece of mechanism on the top revealing with unerring accuracy the stage of progression, which, when completed, also appeals not alone to the eye but also to the ear, by a click. Both this and the erected key are shown in the accompanying cut of the completed slide.



Although we have personal cognisance only of the two models mentioned, Mr. Walker informs us that another was introduced in 1886, which differed from the original in respect of the movement which was attached to the back being disconnected and having a visible indicator, but retaining the metallic frames for holding the rollers. Both of these are now superseded by the last model, in which are combined all their good qualities without any of those which might be open to objection. It is not so wide as the others and is much lighter.

The adjoining figure shows the back of the case removed



and the method of inserting the spool or roll of negative paper. We conclude this brief description by showing a transverse section of the internal parts in which the ingenious automatic



tension rollers are seen. The roll holder both in conception and mechanical execution is a beautiful specimen of work of the highest class.

Mr. H. TRUEMAN WOOD is announced to read a paper on *Photography and the Printing Press*, at the meeting of the Camera Club on the 12th proximo. Many of the principal "process" workers have promised to lend specimens for exhibition, so that there is likely to be an interesting collection of photographs and photogravure work.

We learn from the *London Gazette* of Friday last that the partnership heretofore existing between Messrs. Alexander Lamont Henderson and William Middleton Ashman, photographers, of Amersham-road, New Cross, S.E., has been dissolved by mutual consent, Mr. Henderson carrying on the business alone. Mr. Ashman, we understand, joins Mr. H. M. Smith, and these gentlemen will carry on business in the provinces under the style of Smith & Ashman. Both of these gentlemen will be much missed in London photographic circles. Mr. Hedley Smith has been the Hon. Secretary of the North London since its formation, and much of its success is owing to his energy and ability; he is also an active member of the various other London photographic societies. Mr. Ashman, besides being Chairman of the Council of the Photographers' Benevolent Association, has long taken a most active part in several of the London societies, and contributed much to their interest by his great practical knowledge.

We direct attention to an Exhibition of Photographs, Lantern Slides, and Photographic Apparatus, to be held in the Crystal Palace, commencing on February 20, 1888, particulars concerning which will be found on another page. We are informed by the Executive Committee that already such progress has been made and such encouragement received as to ensure the success of the Exhibition, which is to be on a large scale, and free from some of the drawbacks associated with other exhibitions, especially with regard to the judging.

THE death of Thomas Annan, of Glasgow, deprives photography of an able artist and the world of an honest man. For many years he pursued, with singular success, the profession of photographic artist in Glasgow. The excellence of his work, more especially in the reproduction of paintings, obtaining for him wide and most honourable distinction. Cultured, and with great natural taste for art, he loved the society of artists, and was never so happy as when endeavouring to faithfully translate some masterpiece into monochrome through the medium of his camera. Honourable in feeling, and fastidious in taste, he was utterly intolerant of shams, and of everything below the best. It was natural that he should have felt dissatisfied with the uncertain permanence of silver prints, and been one of the first to introduce carbon printing, and that, later, he should have gone a step further in the direction of permanent printing by taking up photogravure. In this connexion he was associated with Mr. Swan, the inventor of the incandescence electric lamp and of carbon printing. Almost a giant in stature, and with a handsome, clear-cut face and a brilliant eye, Mr. Annan was altogether a noble type of man. One who knew him intimately says:—"He was the personification of truth, and the soul of honour." Mr. Annan was born in 1829, commenced business as a photographer in 1857, and died December 14, 1887.

Our contemporary, the *Athenæum*, can never be said to indulge in an undue bias in favour of photographic processes, its opinion upon which, when questions of art are to the fore, being usually most unequivocally expressed. But in a recent criticism upon a certain book of travels, as it may be termed, it says of the illustrations (which the author of the work, Mr. A. J. C. Hare, states to be "with few exceptions" from his own sketches) that, "judging from the revelations of perspective, and from our knowledge of the photographs of the principal buildings of Paris and its outskirts, we fear that we must pronounce a larger portion of them to be obviously from photographs than Mr. Hare is willing to admit." We should like to know what our readers can make out of this paragraph—a compliment or the reverse, or any meaning at all.

MANY formulæ have been given at sundry times in these pages for making sizing liquids for preparing the surface of albumen or carbon

prints to receive colour more readily than the untreated surface permits. But we have been told, as, indeed, has also been before published in these pages, that many artists use no other medium than that supplied by nature, when the tongue is passed over the glossy surface. It is worthy of being noted, however, as "tinted" photographs have so frequently been shown to be wanting in permanency, that chemists recognise as a fact admitted that there is present in saliva a substance that is capable of acting upon the photographic silver image under certain conditions; in fact, that sulphocyanide of potassium is present. So much of this compound, indeed, is there to be found, that a process has been devised for testing the state of the health by the amount of this salt contained in saliva, this amount being gaged by the colour produced upon the addition of a persalt of iron. Hence it is no way unreasonable to suppose that the moistening the surface of an albumenised print by the tongue may lead to chemical changes of an injurious nature.

At the last meeting of the Physical Society a conversation upon prisms of some interest to photographers was held. It may be remembered that the late Dr. Draper used bisulphide of carbon prisms in some of his spectroscopic researches, an ingenious arrangement being devised, as has been explained by us, for counteracting temperature effects. At the meeting referred to Mr. H. J. Madan described a new refracting liquid capable of taking the place of bisulphide—phenyl-thio-carbimide. It is colourless, has a high boiling point, and a specific gravity of 1.35; its refractive indices for the A and G lines being 1.639 and 1.707 respectively. It is thus seen to be very similar in this respect to the bisulphide; but it is stated to be free from many of the risks and inconveniences attaching to the use of the latter in prisms. The dispersion at the blue end is very remarkable. A polarising prism had also been made with the new liquid, and it gave an angle of twenty-five degrees.

We learn from the Report of the New York Pharmaceutical Association that a factitious glycerine has been put on the market. This substance contains no glycerine at all, nor does it possess any of its qualities; hence, if it should be sent to or made in this country, it may find its way into photographic laboratories, to the undoubted discomfiture of the worker. This sophistication consists of a saturated solution of sulphate of magnesia (Epsom salts) with about fifteen per cent. of glucose. Its taste would be sufficient to detect it, however, not to speak of chemical tests.

A DISCUSSION of great importance on the question of halation arose at the last meeting of the Royal Astronomical Society, from some remarks made by the Astronomer-Royal. Referring to previous statements made at the last meeting regarding the use of curved plates for producing star photographs, as described in these columns, he now gave more complete details of the work. A four-inch objective of sixty-inch focal length, specially corrected for photographing, was employed, and the plates on which the star pictures were taken were curved to "the theoretical curvature of the field of least confusion, the radius of this curvature being about half the focal length. The plates are six inches square, and cover an angle of about five and three-quarter degrees. Images were thrown upon the centre, a little distance away, and upon the edges, and photographed in these positions. A very remarkable appearance was produced with the images a little away from the centre." As one goes further from the centre the image of the star spreads out. It is winged something like a kite; as the exposure is increased the figure fills up a little, you get something of an approach to an oval form; as a matter of fact, with the object glass we have been using, the circle of least confusion seems to be really not a circular patch, but a cross representing the two diameters of a circle at right angles. Captain Abney contributed some of his own experiences, and pointed out the erroneous results obtainable by neglecting the thickness of the film, which in gelatine is so great compared with collodion. The Astronomer-Royal admitted the cogency of Captain Abney's remarks, but thought that,

after bearing in mind possibilities of halation from chemical phenomenon and optical distortion from reflection at the back of the plate, the effects described were connected more with optical phenomena, and he especially pointed out the opposite effects obtained by photographing within and without the focus. Mr. Ranyard described what we consider an observation of greatest value. He stated that part of an image of a star may be cut off by platinum foil placed on the plate during exposure, and "the star's image does not, as far as I can make out, spread under the opaque platinum foil." Mr. Common made also some very valuable additions to the discussion, having a similar bearing to the last. This is a subject of such capital importance that we may return to it at a future time.

COLLODION LANTERN TRANSPARENCIES.

MANY complaints are heard from amateurs who prepare their own lantern slides from collodion emulsion, that they are unable to produce them absolutely free from veil and with the highest lights represented by perfectly clean glass. Occasionally I have had shown to me even by "experts" in the process samples of this kind of defect, which have been sufficiently puzzling to evade all attempt at explanation. Sometimes it is a case of an old and well tried formula with equally trustworthy chemicals that suddenly proves at fault; at another it is a sample of previously proved emulsion that in an equally mysterious manner goes back upon itself, and refuses to give the immaculate results it has hitherto produced, and then, perhaps after a brief interval, the fault disappears as unaccountably as it came. Of instances in which a new formula is tried for the first time and found wanting, though in other hands it has proved quite satisfactory, or where new materials have been employed, I say nothing, for in such cases it may at least be inferred that the causes are traceable to the method of working or to unsuitability of the chemicals, as the case may be. A few hints on some of the least suspected causes of veil may therefore prove useful at this season.

In the first place, I may say that the defect I have to deal with is not in any sense fog, that is to say fog caused by the action of stray light upon the emulsion or films, or by abnormal reduction of the silver haloid by chemical means. It is rightly described by the term I have applied, and for negative purposes would be by many operators considered an advantage rather than the contrary, tending as it does to give transparency to the shadows and general harmony to the picture. But for lantern purposes the emulsion must be uncompromisingly clean and above suspicion.

I may just allude in passing to one or two causes which I do not include in this category, though they may, perhaps, be so classed by some of those who have recognised them. First of these is the pyroxyline itself, which is not infrequently the cause of a more or less marked opalescence in the transparent portions of the film, owing to its unsuitability to the purpose. Many samples of "high temperature" cotton, as well as extremely low temperature papyroxyline, exhibit this peculiarity in a marked degree; indeed, with regard to the latter, notwithstanding the general fact that as a rule papyroxyline gives a far more structureless film than ordinary pyroxyline, I have found it far easier, by slight variations in the strength, proportion, or temperature of the acids in the process of manufacture, to produce this opalescence when operating on paper than with cotton. It is little consolation to the lantern-slide maker to know that such samples are very frequently of the highest possible quality for general emulsion work, or that the opalescence disappears on varnishing the film, and in a great measure when it is moistened; his only remedy is to change his pyroxyline.

Another prolific cause of veil is dirty glass, or perhaps I should rather say, improperly cleaned glass. Some samples of French chalk used in polishing the plate seem to leave an impalpable film upon the glass which exercises a reducing action upon the silver bromide in much the same manner as smears and irregular polishing marks without French chalk do; but in this case the reduction is extremely slight and perfectly even, resulting in a fine veil between the collodion film and the glass and quite invisible on the surface. This is more common in cold and damp weather than the opposite, so perhaps atmospheric condition may be the real cause. A similar result is also

sometimes obtained when a substratum of indiarubber, albumen, or gelatine, is employed, so perhaps the safest plan is to trust to a perfectly pure surface of well cleaned glass.

It is scarcely needful to say that over exposure is one of the most certain methods of veiling the image, that is to say, over exposure not properly checked in development; in the production of warm tones it is necessary to expose very much longer than the time absolutely required to impress the image, but bearing this in mind the developer is suitably restrained to compensate. Over exposure can, therefore, scarcely be classed as an "unsuspected" cause of veil, and yet to a certain extent it is. For instance, we will suppose that an abnormally long exposure has been purposely given; when the plate is developed the operator in order to be on the safe side employs a proportionately augmented quantity of restraining bromide, resolved to err on the side of clearness rather than of veil. The result is that the image is slow in appearing, but when it does come it proceeds regularly and evenly, the high lights beautifully clean, and, in fact, everything seems as it should be.

The details in the high lights long in making themselves seen, are at last there, but the image is not strong enough generally, so a little more ammonia is added to the developer or a fresh and stronger batch is made and applied until the needful vigour is attained. Still everything seems perfectly right, the sky and high lights retain the clean, pearly blue tint of the unexposed plate, the image clearly marked out in a creamy colour verging between brown and red, not a suspicion of fog. The plate is fixed, and as the unaltered bromide clears away the high lights stand out clear and black in comparison with the rest of the picture against the dark background of the sink. It is not until the picture is critically examined against the light with a piece of ground-glass intervening, or after being dried is laid carefully on a sheet of white paper, that the presence of a faint veil becomes evident, but there it is in spite of the precautions.

"In spite" of the precautions! It is those very "precautions" that have caused the mischief, or rather the misapplication of the precautions. If, instead of "piling on" the bromide at the outset, a moderately restrained solution had been used to commence with and used until all but the very finest details were out and *then* the strong dose of bromide together with more ammonia had been added, not only would development have been more rapid, and the image have had better gradation and vigour, but the veil would have been entirely absent. It may appear paradoxical to say so, but that veil is the result of *under exposure*; the strong dose of bromide applied at the wrong time has to a certain extent converted the really over exposed plate into the reverse.

I will try and explain as briefly as possible. All who have used alkaline development in connexion with collodion plates know well how much more powerful and how different is the action of restraining bromide as compared with gelatine. A collodion plate that has received a normal exposure may be developed and intensified without the use of bromide at all, which is possible with but few gelatine plates when liquid ammonia is used. If it be used at the commencement of development its quantity must be exceedingly small, though at a later stage very much larger proportions may be added with impunity. In the early stage bromide not only attacks and destroys the finer details of the undeveloped image, but also deprives the more robust portions of their power of acquiring density; in fact, the over use of bromide at the commencement of development induces in a properly exposed plate precisely the same characteristics as those of under exposure.

In the case I have cited of an abnormally over-exposed plate, the chief force of the attack of the powerful dose of bromide is felt and borne by the half tones and finer details in the lights; while these are being "felt for," or coaxed out, the bromide is hard at work—augmented and reinforced now by that liberated from the reduced silver bromide—undermining the image already formed, and robbing it of its power of gaining strength—not as in the case of gelatine, allowing the better exposed parts time to acquire density while the half tones are held in check. Thus it happens that in bringing out the details of the picture the plate is strained to its utmost limit as regards the quantity of ammonia it will bear, and when more has to be added in order to bring up the density something must happen, and that something is veil or fog. But mark that even now it is

invisible before fixing, for the strong solution of bromide keeps the *surface* of the film clean, and the veil commences at the back.

But if development be started with a moderate proportion of ammonia well but not over restrained with bromide, a second and stronger solution being ready at hand, a thin image is developed with great rapidity, and instantly the amount of detail that experience teaches to be correct has made its appearance, the second or intensifying solution is passed over the plate to check it and allow it to gain strength. With bromide of reasonable strength the visible image suffers but little comparatively, the main check being on the undeveloped portions; therefore by suddenly increasing the proportion of restrainer after the picture is nearly formed we gain the end in view—clearness of lights—without unnecessarily interfering with or slowing the general development. But in any case it is injurious to use too much bromide.

As I have already said, the gradation of the picture will be better and more vigorous; it is remarkable how an extremely feeble and apparently flat image on collodion if produced by the first application of a weak alkaline developer will behave upon treatment with a stronger solution. In the first image there is perhaps little difference between the strongest and weakest portions, but upon applying a solution containing twice the original proportion of ammonia the better exposed parts leap away as it were from the feebler—in a manner scarcely comprehensible to one who is wholly accustomed to gelatine plates. Intensification in this manner is so rapid that if the proper proportion of ammonia be not exceeded there is no chance of fog from forcing or straining the development, as in the other case.

I am presupposing, of course, an emulsion or film that is in perfect condition, for if there be any weak point in its character almost any method of development will find it out. But whether good or bad originally, the "forced" system of development will make a worse mess of a plate than proper or reasonable treatment.

There is another source of veil to which I would call attention in these days of warm tones and long exposures, namely, the source of light employed. There can be no question that gas or lamp light is far the best to use for general purposes; it is well under control, and the length of exposure is not excessive, at least for contact printing, even when the warmest tones are desired. Daylight at this time of year does not present any very great dangers even in contact printing, but magnesium, which is now absurdly cheap, does, if not used with judgment. For contact printing, I should therefore always recommend gaslight, while for camera work circumstances will have to decide the choice. With tolerably sensitive plates there will be greater safety from foggy and weak pictures in the less powerful light than in daylight or magnesium.

But quite independent of the risk of mere over exposure when employing daylight or magnesium, there is also lying hidden another of the "unsuspected" causes of veil. This is to be found in the higher "penetrating" power daylight and magnesium possess as compared with gas. I was shown some time ago a number of transparencies printed by contact, and which were intended to serve as the text for a sermon on the deterioration of collodion emulsion with age. When newly made, but a few weeks previously, it had worked to perfection, giving beautifully clean lights; but now all the results showed a thin veil, slight it is true and nothing that would have been noticed except in a lantern slide. I suggested that the negative might be too thin, but was met with the reply that the same negatives had answered perfectly well with the *new* emulsion.

My reason for this suggestion was, that the margins of the plates which had been protected by the rebate of the printing frame *were* perfectly clear, while the highest lights of the pictures all showed veil. On further investigation I found that my friend had only recently been using magnesium where previously gas had been his means of illumination. Here was at once the solution of the mystery. How few modern negatives are sufficiently dense in their highest lights to protect a sensitive bromide plate from the action of magnesium light, only those who have made the experiment would perhaps believe. Let those who have not already done so test the matter for themselves.

It is clear that if the densest portions of a negative are not *opaque* to a given light that a certain amount of action must take place, and I

the result of that action in the case of a lantern slide is veil. Where such occurs it cannot be altogether remedied by any modification of development without affecting the rest of the picture also. So employers of magnesium light had better be warned in time.

In conclusion, I would give a word of advice to those who are more accustomed to gelatine than collodion dry plates, namely, to use plenty of light in developing. The collodion image is far more difficult to see than that on gelatine, but it is at the same time infinitely less exacting in the matter of the colour of the light it will bear with safety. I have no doubt "canary medium" and similar risky fabrics (for gelatine) might be used with care; I employ, myself, glass coated on both sides with collodion containing in each ounce eight grains of cotton and thirty grains of aurine. This I find perfectly safe, but if any gelatine person should feel nervous he may add a thickness of yellow paper.

W. B. BOLTON.

THE PRESERVATION OF SILVERED PAPER.*

No. 13.—Mr. Jex Bardwell (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1870, page 544) says, "The following formula will keep the paper for three or four days in perfect condition without washing or fuming:—

Silver nitrate	480 grains.
Water	16 ounces.

Dissolve and add a few drops of ammonia, then add ammonia nitrate one ounce. The sheets are to be laid on blotting paper, and the excess of solution is to be removed." *Remarks:* The function of the ammonia nitrate is not obvious to me, but my inference is the same as that I drew from extract No. 12.

No. 14.—Mr. Antony (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1871, page 24), says, "When alum is used in the silver printing bath the paper keeps far better in hot weather."

No. 15.—The Editor of the JOURNAL (1871, page 35) says, "The silver solution will take up only a very minute quantity of alum." He does not allude to the keeping qualities of the paper.

No. 16.—The Editor thinks (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1871, page 48) "The value of the method chiefly depends on the combination of silver nitrate with silver sulphate, the latter saturating the liquid." I have no remarks to offer and no inferences to make upon the last three paragraphs at present.

No. 17.—Mr. Engleman (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1871, page 138) advises washing the paper and fuming it. He says he has "kept such paper for months with impunity." My inferences and remarks have been already given in conjunction with a previous extract.

No. 18.—The Editor (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1871, page 348) says, "Mr. Carey Lea has found that by simply adding tartaric acid to the silver bath paper excited on such a solution will remain white and in otherwise good condition for seven weeks after preparation." I have at present no remarks to offer and no inferences to draw upon this matter.

No. 19.—Mr. Carey Lea gives his method of preserving paper in THE BRITISH JOURNAL OF PHOTOGRAPHY for 1871, page 351. He says it "keeps perfectly for seven weeks," and should, he says, "be kept in a dry atmosphere." He also advises the use of gelatine and glycerine. *Remarks:* I fail to see the use of deliquescent and hygroscopic substances if the paper must be "dry."

No. 20.—Mr. Homersham (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1871, page 512) expresses approval of Mr. Lea's method of preserving paper by the use of tartaric acid. He advises that the paper be kept in a wooden box with a closely fitting lid.

No. 21.—Mr. Wilkinson (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1872, page 141) advises that citric acid and ammonia be added to the printing bath. He says the paper keeps white for a "considerable time."

No. 22.—The Editor (THE BRITISH JOURNAL OF PHOTOGRAPHY 1872, page 376) says, "Formerly we were satisfied with the supposition that the organic substances present caused a slow reduction of the silver nitrate. We believe that the yellow or yellowish-brown colour of the kept printing paper is not due *alone* to the reduction of the silver nitrate."

* Continued from page 758.

No. 23.—Mr. Antony (THE BRITISH JOURNAL OF PHOTOGRAPHY, 1872, page 478) advises:—*First method:* Floating on silver solution, then on water, then on an aqueous solution of alum. Thus prepared he says the paper keeps absolutely white for four months after preparation. It requires fuming before being printed on. *Second method:* "Float the back of the sensitised paper for a short time on a five-grain bath of oxalic acid. No fuming is required." *Third method:* "Use thirty-five-grain silver bath. Add two grains of citric acid to each ounce of solution. Add ammonia, and dissolve nearly all the precipitate with nitric acid."

With this last extract ends the roll of notes upon which by sheer accident I have laid my hand. I will defer my further observations till they have appeared in print. In the meantime I hope to find further manuscripts relating to this matter, and particularly those of my own experiments.

D. WINSTANLEY.

COLOURING AS APPLIED TO PHOTOGRAPHY.*

It was my original intention to go straight ahead into the various methods of colouring photographs in *natural colours*, but find it would be impossible to do the subject sufficient justice in the limited space that may be allotted to me between now and the new year. Therefore, this branch must remain untouched until the old year will have run its length, and a brighter time, I hope, may come to all of us, both photographically and socially. I think, therefore, all things considered, we may gain advantage by giving one parting glance at the past, as regards the treatment of photographs worked in monochrome, whether they be enlargements or otherwise, before quitting this subject for a more advanced branch.

As a workman requires first-rate tools to turn out first-rate work, so we must provide ourselves with suitable materials, if we wish to produce *our* work in like manner, of the first quality. I will assume, therefore, that we are provided with Winsor & Newton's colours and brushes, &c., and a bottle or two of Newman's sizing preparations, gum water, &c., and with, say, a 24 × 18 enlargement (carbon) on our easel, we are ready to start work. Let our subject be an elderly man, with well defined features and grey, almost white, hair. The figure three-quarter, as in such cases all our knowledge of working in monochrome can be called into requisition.

Our first task will be to *prepare* our enlargement, which we do as already laid down, thus securing for ourselves a surface that will easily receive the colour we place upon it. We cannot be too careful in this matter, as much of the comfort we will have while working will depend, to no small extent, upon the condition of the carbon film. If imperfectly prepared we may have no end of trouble before we gain a satisfactory result.

Another point which should be constantly borne in mind by photographers generally, and more especially by those who expect good results attained at moderate prices, is the printing. On the depth of the print must naturally depend the general *tone* of the picture. Thus if the print be "*too dark*" the picture, when finished, will present a rather heavy appearance, while, on the contrary, if printed "*too light*" it will have a *washy* effect. As I said, this more strongly applies to cases where the artist gets but a moderate price for his work. It is needless to say that any effect *can* be gained by a good artist almost in spite of the defects in printing, but it must be at the cost of much time and labour. In a dark print the shadows will require such a lot of *rubbing down*, as will necessitate a very considerable amount of working up afterwards to restore its brilliancy. In a like manner with the print which is *too light* the lack of brilliancy and "*go*" must be obtained by hard work and much expenditure of time. Therefore, I say, it should be thoroughly understood by the printing department that a certain class of print *must* be sent out or it will be returned as useless. It is scarcely fair to throw all the unnecessary trouble on the poor, struggling artist's shoulders, when, by a firm and distinct order to the printing department it can be easily obviated. I know some photographers who are *very* particular upon this point and will never send an imperfect print, be it too light or too dark, to their artists, but return them and have others of proper density produced instead. This is as it ought to be, but I regret to say I know of many more photographers who will not go to this trouble, but content them-

* Concluded from page 759.

selves with "It will be all right when worked up!" The photographers who adopt this latter system have never worked up carbons themselves nor do they know the nature of them, and their ignorance in regard of the extra labour given to the artists must plead their excuses. I must say, however, that men who understood the work, but who have never viewed the matter from this point before, have seen the justice of it when I, as a worker, have advanced it for their consideration.

From all this it will be seen that in *rubbing down* we should be very careful to remove as little of the *brilliance* of the photograph as possible, and so economise our labours. The shadows which may lose their clearness and beauty in *rubbing down* (if same has been properly done) may be restored by the application of a glaze of medium or gum water. If, however, the *rubbing down* be carried *too far*, they will require a considerable amount of *working up* to make them as they should be. For the producing of lights where shape or definition may be required, erasers mounted in cedar should be used. They can be brought to a point and worked as one would work a crayon. Even a pattern can be suggested, if not completely worked out, on the background, &c.

Having, therefore, paid such attention to the preparing of the surface of our picture as will enable us to work with ease and at the same time preserve all the brilliance in the shadowy details, we can proceed to work the figure. Many artists start with the background, still I think it better to begin with the head. Having advanced the treatment of the head to a certain point then take the background and draperies, &c., and finish them. This done, return to the head and finish it. On consideration, I think many reasons will suggest themselves why this method is the more advantageous of the two. We are more likely to secure softness and delicacy and certainly a better degree of finish generally.

The first portion of the head upon which our attention should be bestowed is naturally the forehead. To this feature (if I may so call it) the most essential quality is breadth, and our efforts in working upon it should be directed towards attaining this effect. The intellectual endowments of the original may be greatly flattered or maligned by our treatment of this feature, and there is really more *likeness* in it than many people think. If ever we deviate from strict adherence to nature, it should be to compliment it rather than offer it an insult. Therefore, as I said before, we must so work the forehead as to endow it with breadth. Needless to say the *formation* should be strictly preserved, and not, as might occur through inattention, be lost in our endeavours to produce *roundness*. As before laid down the strokes of the brush should mostly run in a horizontal direction, not too much so, nor even to such an extent as to attract the eye to the fact that they *are* so; nevertheless, the fact of their being horizontal will give breadth to the feature.

The eyebrows come next and are very important, and require a good deal of judgment in their treatment. On their prominence depends much of the expression, not only of the face generally, but more immediately of the eyes as well as the shape of the forehead. In cases where the forehead is rather square and heavy, the brows are always very prominent; this fact will almost always necessitate giving the eyes the effect of being rather sunken. Care should be taken lest we should accentuate this fact, for it does not add to the general or favourable appearance of the face that the eyes should be thus discounted.

From the eyebrows we come to the eyes. On the expression of the eye or eyes, as the case may be, will depend in very many cases the success of the whole picture. As in life the eyes fix the attention, so it is in a picture. In a portrait where the eyes are uninteresting we will never find satisfaction. But, where we succeed in endowing them with expression and motion, we almost command success for our portrait. With all this, however, they must be *soft*, nothing will save them otherwise; nothing is more objectionable than *hardness* in their treatment. They may have *expression*, even when they are *hard*, but the latter quality will prevent their ever appearing pleasant; and a pleasant portrait should ever be the result an artist seeks to produce. Considerable expression can be imparted to the eyes by the thoughtful treatment of the eyelids. A few delicate touches on the upper lid, suggesting the presence of the lashes, will do much to enhance the beauty of the eye. I say these touches must *suggest* the presence of the lashes because it would be ruinous to thoroughly

define them. Their presence should be, as it were, indicated or expressed by a soft shadow.

The nose, although a very important feature, is not so very difficult of treatment. Care must naturally be taken when placing the *high light* upon it or else we can very easily falsify its shape. We must also rigorously avoid making a straight line of light down the ridge of the nose, for such produces a most *lifeless* effect, to say nothing of its being unnatural. It is comparatively an easy feature to work upon, demanding only a little care and judgment to secure success. Be sure never to let the cavities of the nostrils be too black in comparison to surrounding parts as the effect would be fatal. Force can be imparted to the nose or *vice versa* by strengthening or reducing the cast shadow down its side. In strengthening this, however, never make it *too dark*.

Next comes the mouth, a most important feature, second only to the eyes. There is no feature which holds more fully the gift of expression, and therefore demands considerable skill to ensure success in its treatment. Often the light will catch the lower lip in such a way as to really disfigure it. This must be altered, and a soft effect secured instead. The photographer, in many instances, is powerless to avoid this ruinous and shapeless diffusion of light, often resulting from the skin being dry or cracked. As it spoils the expression of the mouth it must be reduced to proper proportions, and treated in such a manner as to add to the pleasant expression of the portrait. This can always be done by trying to raise the muscles of the face wherever it is practicable. Shadows falling from the nose should be raised, also those formed at the corners of the mouth. A portrait may be wonderfully benefited by a judicious treatment of these points.

The chin is not a very troublesome feature, but still requires care in its treatment. If treated badly or thoughtlessly it may deprive the face of much of its power or firmness. It requires more thought than skill in manipulation. Of course, in the cases where men have heavy beards and moustaches, the mouth and chin will not require our aid. We will have, instead, to strengthen and give force to them, and in so doing, which applies also to the hair on the head, avoid all approaches to minute detail. If we were to attempt the latter, in all probability *wiriness* would be the result. All hair should be treated in masses.

The hair should be worked in *masses*, the lights being put in with an eraser. This in many cases will be sufficient, but if *not*, a few touches of the brush charged with Chinese white will add considerable brilliancy and power to the general effect. Great care and judgment should be used in treating this portion of a portrait, as it is an essential that it should possess a certain amount of *power*, and yet not lose its quality of *softness*.

Having worked up the face satisfactorily by a judicious intermingling of *hatching* and *stippling*, we have the background and dress to finish, which must be treated in a broader style. A free, open *hatch* being, perhaps, the most effective, and also calculated to enhance the value of the face. In many cases the dress will not require more than a few touches here and there to remove some slight blemish, and a glaze put in the shadows to give them a little extra force. Patterns are often worked into the background with the eraser, which will give an air of elaboration to the work and yet keep in harmony with the rest of the picture.

After having worked up the dress and background, &c., it may be found necessary to do something more to the head, but it can only be to repeat what has already been laid down until you get the desired result—a harmonious whole. Great taste can be shown in monochrome work, and, with the exception of crayon drawing, perhaps, nothing can show more completely the mastery which an artist has achieved over the delicacies of light and shade, than a really good monochrome.

REDMOND BARRETT.

THE LONDON STEREOSCOPIC COMPANY'S EXHIBITION.

SECOND NOTICE.

RESUMING our notice, we have first of all to observe that it is very pleasant to see so many ladies coming out as exhibitors. During our visits several ladies have been present, and from their remarks it was easy to perceive that they possessed knowledge of the art. Their criticisms on the works of the sisterhood seemed to be free and outspoken, yet did we not hear any one so much as attempting to pull another to pieces. Photography is veritably a great humaniser.

Of a frame of nine pictures by Miss E. G. Stone (35), while none are below the average, *At Gulval, Cornwall*, is the best. Her *Well, Gulval*, would have been much better had it not been for the rather stiff posing of two figures. Her *Bridge over the Stream* seems, when looked at from a distance, to be marred by a pronounced horizontal line across the picture, but which on a nearer view is found to be a prostrate trunk of a tree, which is the bridge. All that is wanted to render this a very charming picture is a more oblique view of the "bridge."

Miss Maude Sulwan (*Six Marine Views*) has been very fortunate in one of her pictures, a boat with a number of figures. The others, too, are good. The *Morning Bath* of David Lewis represents a group of cattle in the water. The leaning of a doorway, *In the Mosque, Futtepore*, by F. L. Cox, renders it uncertain whether this is a freak of the Indian architect or arises from the camera not having been levelled; but otherwise it is a well-executed picture. Three views by the Rev. H. B. Hare, *The Cooling Stream, Thirsty Moments*, and another, possess a softness and delicacy that charm the spectator. The *Sport in Many Lands* of Sir Robert and Miss Harvey arrest attention from the subjects—animals quite unknown in this country, except through treatises on Natural History. Of the exhibits of W. H. Banks, *Street, Meiningen*, will be considered his best. H. Hood Daniel's *Spring and Summer*, while dismissed by the Judges with a "highly commended," are certainly much more deserving of a medal than many others thus favoured. Concerning two pleasant outdoor scenes by Captain Brown, three pictures by the Countess Oriola, two by A. James, and two by Mrs. West, we have nothing special to say. The last-mentioned are of average excellence, the others are entitled to rank a little higher, especially one by A. James, *The Keeper's Cabin*, and another. Concerning a frame of nine pictures by Lieut.-Colonel Hooper the figures in all are naturally and artistically posed, in this respect being probably the best in the Exhibition. Their technical merits are also high. *The Amateur Photographer* of Rev. F. C. Lambert (two children playing at portrait taking) provokes a smile. *A Labourer's Luxury* (W. Adcock) is a large portrait of a man thoroughly enjoying a pipe of tobacco—a solace, no doubt, well earned.

Several imposing pictures are exhibited by J. T. Hopwood. What a pity this artist had not some good genius at his elbow when trimming his prints, to have advised him to take an inch or more from off his foregrounds, especially those of *Ketton Hall, Kirby Hall*, and *The Courtyard*. This would have rendered them as faultless as his *Avenue, Ketton Hall*, than which nothing can be finer, unless it be his *Jack*, which is perfect.

Several pictures are exhibited by George Davison, all of them above mediocrity. His *Fishing Village Group* is cleverly posed, but his *Who so Contented as He?* carries the palm.

Four pictures, *Ederline Lock* and others, by Miss C. Wrigley, attest this lady's skill with the camera. Such also may be said of a frame of instantaneous and other views adjoining, by E. A. Gollidge; *A Wayside Rest* (C. Smerdon Roe), several views by H. Manfield, and four Indian views by Dr. Wellington Gray. The last-mentioned are attractive subjects, but the intensification of the negatives has been carried too far, causing the lights and shadows to be so vigorous as to suggest hardness. Above the average are Cyril S. Cobb's *Riva Lago di Garda* and an *Interior of a Church*, also the *Jersey Cattle* of J. T. Hopwood.

Mrs. Brian Hodgson, in her frame 68, gives promise of better things before long; and in 71 Miss E. G. Stone shows that she has an eye to a good pose.

We have more than once named J. T. Hopwood, who has taken highest awards in various classes; his *Winter and The Music Room, Ketton Hall*, are truly magnificent works. The *Exeter Cathedral* of Harry Tolley shows that the cold tone which suits so well many of the exhibits of this artist is not best for every purpose. A much warmer tone would have better suited the subject named. This applies also in some measure to three pictures (70) by Dr. Vos, which are otherwise excellent.

Miss Miles has admirably managed her *Two Studies* of horses, and Mrs. Edward Penton has made the most of a subject (*A Worcester-shire Harvest Field*) not very attractive in itself.

PHOTO-MICROGRAPHY.*

Exposure.—With this begins our real difficulty, and only several trials can enable us to arrive at the correct time to give, for it not only varies with the objectives used and the distance the plate is from the object, but is also governed by the colour of the object.

* Concluded from page 793.

For instance, take a brown insect, or parts of an insect, and it will be found impossible to photograph more than its outline. Its brown chitinous skin presents a barrier no actinic rays can pierce. Better results can be obtained if the insect has been decolourised by long immersion in turpentine; but although its brown has been reduced to a yellow, this affords but a slight amelioration of the difficulty. Insects may be bleached as white as paper by being steeped in a mixture of chlorate of potash and water to which a few drops of hydrochloric acid has been added, but while this bleaching fluid removes the whole of the colour, it destroys the whole of the internal structure, and so robs the photograph of half its value and beauty. Again, exposure is dominated by the staining of a tissue. Staining processes have an immense value to the histologist, as by their means the elements of a tissue can be differentiated in a manner which the highest power objectives are unable to accomplish. But staining may be of two characters. There is the selective staining, by which the nuclei of a tissue, or its growing parts, are, as it were, picked out from those parts which are formed, and in which no active functions are in operation. Now, this, however valuable to the microscopist, is detrimental to the photographer, for it is, to say the least, not pretty to see a photo-micrograph of an anatomical or pathological subject dotted all over with the stained nuclei. Luckily, staining may be made general, and it is in this direction we may look for aid in our operations. In this way an unstained section, whether of an animal or vegetable nature, if cut as thin as our previous observations show to be necessary, is so diaphanous that it will not throw an image on the screen, and the subject and the background are so much alike that there is no contrast between them in the resulting negative; but if the section be stained with a general stain it removes this disability, the image of the object being retarded in proportion to the colour and depth of the stain, while the background gets its full exposure. Stains vary in colour, and their influence on exposure and this variation must meet with due consideration at our hands. In practice, I find the blue stains, especially if pale, and the logwood stain, if too lavender, do not give that retarding action necessary to get a good negative, even with the shortest exposure, the image being buried in one uniform density. Carmine stained preparations give very good results. Bismark brown stained preparations give good negatives, and do not require such a long exposure as many would imagine. It is of very little use to be guided by tables of exposure in this branch, as they can, at best, be only used as an approximation to correctness, and practice and judgment are the only guides upon which the beginner can rely; but the table given by Mr. Walmsley, and which I have before quoted from Nos. 13, 14, and 15 of THE BRITISH JOURNAL OF PHOTOGRAPHY for 1885, will furnish a very reliable guide for those who take up this class of work for the first time, but after that the student should draw up tables for himself, to be modified according to circumstances.

The plan I have adopted for ascertaining the magnification of an object is simple and accurate enough for all ordinary work. The sliding baseboard carrying the sensitive plate is marked off roughly into five divisions of about half a foot distance apart. An object exactly one-sixteenth of an inch was chosen, and its image was projected through the lowest power objective intended to be employed, and being focussed on the screen, its dimensions were taken at the first division by means of compass and rule, and its amplification determined accordingly. The sliding base was moved through all its divisions, and the same performance gone through for each of the objectives employed. Now, if the object which we know to be one-sixteenth of an inch is magnified at the fifth division to four inches diameter, we call that $\times 64$, and so on for all the objectives and for every class of subject. Thus having, as we have done, determined on the magnification in diameters which every objective will give at every division of the baseboard, we are enabled to tabulate these and hang up the table near the apparatus.

There is one thing this apparatus in its present form cannot do very comfortably, and that is, photograph opaque objects. It might be made to do that, however, by widening the baseboard, and some day it may be further modified to accomplish this. This class of work requires more attention than I can give it, so I must perforce leave that to others, but I dare say I shall some day feel inclined to add to the apparatus some arrangement by which the light from the lamp can be thrown on to opaque objects or the light from two lamps of differing intensity employed.

Then, again, I might be expected to say a few words relative to the use of orthochromatic plates for photo-micrography. I have used these, both purchased and made by bathing in erythrosine, and except in double stained sections of plants, have not obtained sufficiently marked results to induce me to get these plates in preference to the usual ordinary kinds.

I have, in these few brief remarks, touched on the cardinal difficulties which beset the path of the photo-micrographer. These may be, to a limited extent, removed, so that they are less obtrusive, by the concentration of many minds on the task, but they can never be entirely overcome on account of the physical laws involved in their production. In the meantime, however, many of them may be lessened by proper attention on the part of the preparers of microscopical objects by their mounting these as flat as possible, by particular attention to necessary reduction in thickness, and the selection of suitable stains. Thus, insects mounted entire, without pressure, and rendered perfectly transparent, are beautiful objects, and eminently suited for examination with a binocular microscope, but are perfectly useless for photography; while, had they retained their transparency and been mounted flat, they would, at least, have conveyed an idea of their form in a photograph. Again, sections are either too thick, not flat, or unsuitably stained. Some sections I recently examined presented in miniature all the beautiful undulations of some rolling downs, instead of that absolute flatness which would ensure a sharp photograph. We may expect an improvement in this department of the photographic art only from the combined operations of the histologist, who knows what is required in photo-micrography, and the photographer, who knows something of the normal characters of the histological elements. It is at present useless to trust to professional mounters, who do not know, or do not care to know, the conditions necessary to the making of a successful photograph, and who ought to be, at the same time, in the possession of the knowledge of microscopical anatomy to enable them to put up suitable subjects properly. As an illustration of what I intend to convey, take some of the sections of tongue frequently met with; they usually present a confused, broken up mass of muscular fibre with here and there a piece of glandular structure, and crowned with a range of unimportant papillae. Now, such a section would be a far more instructive agent if it had been made through a filiform or a fungiform papilla. I need not multiply instances, this one will suffice to exemplify my meaning. Section cutters should always endeavour to include in their sections some important element of interest, then, if cut thin enough and suitably stained, a photograph full of instructive detail will be the result. Life is not long enough for one man to devote his leisure moments, snatched from the business of bread winning, to every branch of this interesting work; therefore, from personal experience, I plead for this division of labour.

T. CHARTERS WHITE.

ON NEGATIVES AS AFFECTING THE PRINTING.*

THERE are many who think that provided the negative will give sufficient contrast from light to shade with a full amount of middle tints that it must necessarily be a good one. That this is by no means the case with gelatine negatives I hope soon to show.

I have lately had my attention called to the fact, that in printing from two negatives which took about the same time in the frames, and gave equally good results in contrast and middle tints, the print from one looked flat, and if the slightest overdone, the high lights appeared fogged as if it had been exposed all over to the light, while the other was clear and round, and even when over printed still retained its good qualities. Upon examining the negatives I found that No. 1 was thin, such as would have frightened an old collodion operator, but was sufficiently non-actinic to print strong and vigorous, while No. 2 was very much denser, more resembling a collodion negative in colour, and, as I before mentioned, took about the same time, or if anything rather less than the other in printing.

Upon inquiry I found that all of the No. 1 class were developed with pyro and ammonia, while the No. 2 were developed with pyro and the carbonates of either one or both of the fixed alkalies. It would seem from this as if the carbonates of soda and potash with pyro gave much better negatives for printing than these in which ammonia was employed; but I have lately had numbers of plates quite equalling the No. 2 both in appearance and good printing qualities, which I knew were developed with pyro and ammonia. In seeking as to the cause of this I find that these latter had had the development carried on much farther than in the No. 1, and the whole of the non-actinic colour discharged by soaking for a few minutes in diluted sulphuric acid, half an ounce to a pint, as recommended by Messrs. Morgan & Kidd.

There is no question that however this non-actinic colour may assist the density of the negative, it is at the expense of all rotundity and clearness of the prints, so that in all cases it is advisable to be discharged. Now the point to arrive at is this, Is this colour due to the action of the ammonia or the pyro, or is it only in the use of a caustic

* Written for ALMANAC, but received too late.—Eds.

alkali? that is, would it also occur if the solutions of oxides of sodium or potassium were employed? and would the carbonate of ammonia be better than the liquid?

This latter is commonly used, not so much on account of its cheapness as that it is supposed to require less exposure of the negative plate than any other, and also that the development is quicker finished, but possibly if first-rate negatives are studied the extra trouble it gives to make them good printers will not be found to be much in its favour. It is also very certain that the more sensitive plates are much more liable to produce this strong colour in development than the less sensitive ones, so that it is better to use these last for general purposes, and only use the others for special occasions where great rapidity or work in rooms or studios is required.

FRANCIS G. ELIOT.

HISTORICAL NOTES ON THE OPTICAL LANTERN.

[A Communication to the London and Provincial Photographic Association.]

My first invitation to read a paper before a photographic society having emanated from this Association, it is a pleasure to respond this evening to that honour. The announced title of my memoir was *Lanterns and Lantern Slides in the Nineteenth Century*, but now that the paper is finished, it contains some information of earlier date, hence that title acts as a kind of bed of Procrustes, and either the title or the paper must be cut in two to suit each other, therefore a new heading has been chosen. The details about the optical lantern collected to bring under your notice this evening are historical rather than scientific.

The history of the optical lantern, the "magic lantern" of our younger days, has yet to be written, for to my surprise, after beginning to investigate the subject, I have been unable to discover a single book devoted to the history of the instrument, and the complete story will have to be gathered hereafter from scattered works on optics, from encyclopædias, and from certain old trade catalogues of opticians which may chance to have escaped the ravages of time and pipe-matches. A few books, or rather pamphlets, worth perhaps about a shilling each, exist, devoted to descriptions of special forms of the modern instrument. The following notes represent the results of such small research as could be made within the past week or two among records of the past, and they may serve to roughly indicate to the real historian of the future the general nature of the path he will have to traverse.

One reason of the paucity of the literature of the optical lantern is that, up to recent times, the instrument has been regarded merely as a means of amusement. In the English Patent Office it is not entered under the heading of Optics, and he who would discover patented inventions related thereto, will find it classed by the Government under "Toys." The earliest patent taken out in relation to the lantern bears so late a date as January 14, 1860, by Mr. Willoughby Smith, of Atlantic Telegraph celebrity.

The magic lantern was invented by Athanasius Kircher in the year 1646. There are speculations that it may have been known before his time. Some have ascribed its invention to Roger Bacon, who, in his *Discovery of the Miracles of Art, Nature, and Magic*, written about the year 1260, displays knowledge of the uses of lenses. Others have speculated that it may have been known to Egyptian hierophants, because they understood the properties of concave mirrors. Cellini, who died about 1570, describes spectres which had been seen in ascending smoke, and it has been said that these must have been produced by an optical lantern. All this is but speculation. The one thing which can be clearly seen by us when peering into the mists of antiquity, is that Kircher gave the first clear description of an optical lantern, and was personally proud of its invention, see *Ars Magna Lucis et Umbrae*, Athanasii Kircheri, in *decem Libros digesta*, Romæ, MDCXLVI. In his preface to a portion of this book devoted to optical instruments, including some peculiar cameras among other things, he says that they are not the work of the Devil, but the result of contemplation. He adds that he has to tell of one of the rarest secrets of nature, that it will excite admiration in the minds of spectators, that nobody has done anything of the kind before, that he made the first experiments before any one else knew anything about the matter. Other people sometimes promised rare, wonderful, and unheard of things which afterwards proved all wrong, but what he had to tell would prove all right. Evidently the worthy priest, for priest he was, stood upon excellent terms with himself.

Kircher was born at Giessen, near Fulda, Germany, May 2, 1602. He was, when a boy, educated in the College of Jesuits at Fulda, and in the course of his ecclesiastical career resided at Cologne, Coblenz, and Mayence. In 1635 he was Professor of Mathematics at Vienna; subsequently he went to Rome, where he died November 28, 1680,

Kircher's lantern contained a plano-convex bull's-eye condenser, a double convex lens as the objective, and a conical oil flame as the source of light; the slide was placed between the condenser and the light. Messrs. Carpenter & Westley have a diagram of Kircher's lantern in their possession. Kircher was a voluminous writer; the titles of his books form a long catalogue. He prided himself on his skill in deciphering hieroglyphics. A student, one André Muller, did some scribbles on a parchment and forwarded them to Kircher as antique records; the unsuspecting *savant* replied that they were true hieroglyphics, and sent Muller the translation.

Leonard Euler, the mathematician, invented the modification of the optical lantern for exhibiting images of opaque objects, and he described it, with a diagram, in one of his published *Letters to a German Princess*, dated January 8, 1762. It consisted of a lantern with a tube and double convex lens in front, and at the back, opposite the lens, was a kind of saucerpan lid, which held the object to be projected. In the lantern were two opaque screens, or wings, behind each of which was a lamp with a large wick. The lamps illuminated the object, and the wings screened the lights from the lens. He says: "I have contrived in this box two side wings for the reception of lamps with large wicks, and in each wing is placed a mirror to reflect the light of the lamps on the objects. . . . The ordinary magic lanterns, however, are not constructed in this manner, and serve to represent no other objects but figures painted on glass, whereas this machine may be applied to objects of all sorts." To magnify a fly to the size of an elephant, he recommends that the rays of the sun shall be concentrated upon it by a "burning glass," to give sufficient illumination. This treatment, we may surmise, would be bad for the fly.

In the *Dioptrica Nova*, by William Molyneux, published in 1692, is an engraving of a magic lantern, in all respects the same as that of Kircher—a simple oil flame, a plano-convex bull's-eye of great curvature, and a double convex objective. Molyneux calls it the "Magic Lantern, sometimes called the *Lanterna Megalographica*." He speaks of it as a well-known instrument, made by "common glass-grinders," and he states that in some of the instruments a reflector is used instead of the lenticular condenser.

For about 150 years little or no improvement was made in the original instrument of Kircher. Towards the close of the eighteenth century, Dr. Gravesande, a Dutch man of science, described a magic lantern containing a four-wick lamp. The oil from the lamp traversed a horizontal pipe carrying the wicks. The flame was made up of four little flames, which by touching one another made "one square flame two inches wide." A concave reflector behind increased the illumination. This lantern had a five-inch double convex condenser. The objective consisted of two double convex lenses; the diameter of the one next the light was three and a half inches, and was of considerable convexity. The front lens of the combination was smaller and flatter, and was placed three inches from its neighbour. There was a diaphragm between the lenses, and the information was published that unless the diaphragm "be just where the rays intersect, it does a great deal of mischief." For additional information about this lantern see *A Compleat System of Opticks*, by Dr. Robert Smith, Professor of Astronomy at Cambridge, and "Master of Mechanicks to His Majesty," 1784. Five years after this, in the year 1789, Argand invented his lamp. Before this date the optical lantern was necessarily an imperfect kind of instrument, unless sunlight were used as the illuminant. The solar microscope was invented by Nathaniel Lieberkuhn, of Berlin, in 1738.

With the exception of the step described by Gravesande, all the great improvements in the optical lantern have been made within the last one hundred years; before that time illuminants were too feeble. If I remember rightly it was Charles Lamb who described our forefathers as persons who "walked in the dark, groping."

Phantasmagorical effects were first seen in London in 1802, at the Lyceum; their advent is thus described in *Chambers' Journal* of April 28, 1849:—

"In 1802, a French gentleman, a M. Philipstal, astonished crowds of people in London by an optical exhibition which he entitled the Phantasmagoria. It was a soul-appalling spectacle to those who had hitherto been ignorant of the wonders of light and shade. The spectator was a room where no light but that of a dismal oil lamp, hanging in the centre, was admitted. On the assembling of the audience, this lamp was drawn up into a chimney, and a pitchy gloom overpread the place. Presently the soft and mournful notes of æpulchral music were heard, and a curtain rose displaying a cavern, on the frowning walls of which were depicted the forms of skeletons and spectral figures. The music ceased; the rumbling of thunder was heard in the distance. Gradually it became louder, until at length vivid flashes of lightning, accompanied with peals apparently of the deep-toned organ of the skies, gave all the impressions of a tremendous storm. The thunder and lightning continued at their height, when suddenly a small cloud of light

appeared in the air; it gradually increased in size, until at length it stood revealed a ghastly spectre, around whom the lightning gleamed in fearful reality. Its eyes moved agonisedly from side to side, or now turned up in the sunken eye-socket, the image of unutterable despair. Away, back to the dim abyss from whence it came it was seen swiftly to retire, and finally vanished in a little cloud, the storm rolling away at the same time. Then came other phantasms, some of which rushed up with apparently amazing rapidity, approaching the spectators, and again as rapidly receding, to return clothed with flesh and blood, or in the form of some well-known public personages. After a display of a number of similar apparitions, the curtain fell."

If the man were still living who wrote the foregoing harrowing description of a magic lantern entertainment, and were to apply to the *Daily Telegraph*, he would probably be engaged as a leader writer straight off. How the narrative reminds us all of early days at the Polytechnic, when from the depths of the yawning cavern the bloodthirsty ogre expanded into view, amid the crash of gong and the roll of drum, while Mr. J. L. King, who governed these terrible powers, steadily controlled the incantations without being the least bit frightened; he ruled the whirlwind and the storm, unmoved and serene he stood amid all the horrors of a Walpurgis night.

Phantasmagorical effects, it is scarcely necessary to state here, are produced by means of a translucent screen, behind, and to and from which, a lantern is run upon rails; as it approaches the screen the figure represented diminishes in size; as it recedes from the screen, the apparition increases in size but diminishes in brightness. To equalise the illumination various devices have been invented, among them the interposition of a varying number of curtains. The objective has to be moved in its tube as the lantern advances or recedes, so that the image shall always be in sharp focus upon the screen. Some operators have been clever enough at private lantern displays to manage all the motions of the camera and its parts without additional automatic appliances; their plan in old days was simply to tuck the lantern under one arm, and go to work. With a modern three-wick lantern the temperature would, under such circumstances, be objectionable.

Before lantern objectives were constructed capable of giving a flat field upon the screen, the designs to be exhibited were in some rare instances painted upon concave instead of flat pieces of glass; these old concave slides are now great curiosities.

The oldest manufacturers of magic lanterns in this country are Messrs. Carpenter & Westley, of 24, Regent-street, London. Philip Carpenter began the making of lanterns in Birmingham about the year 1803, and subsequently the late William Westley, who was born in 1807, entered his employment. In 1827, shortly after the removal of the business to London, William Westley rejoined his employer, first as foreman, than as partner; lastly he became the principal. He died at the beginning of this year, 1887, and was buried in Highgate Cemetery. Philip Carpenter was the uncle of the late Dr. W. B. Carpenter, the physiologist; the latter is said to have acquired his taste for scientific pursuits from the interest he took as a boy in the lanterns and lantern slides of his uncle. When dissolving views were invented, about 1836, by an Italian, whose name I have been unable to obtain, and, it is said, by Henry Childe, independently of each other, Dr. Carpenter wrote to Messrs. Carpenter & Westley, asking how they were produced and giving his own theory; he did not guess that two lanterns were brought into play. That letter is still in existence. When dissolving views were first invented, William Westley put them before the public, but the method of their production was kept secret. William Westley raised lantern slide painting to a fine art; he selected the best artists and encouraged them to improve by paying them twice the usual fees for their work, with something in addition for any exceptional specimen of skill. Among the best slide painters he employed may be mentioned Thomas Kearnan, the best slide painter of architectural subjects who ever lived; he died in 1872. Another was Henry Childe, who claimed the invention of dissolving views; he was clever at scenic effects, such as rippling water, summer and winter, eclipses at sea, and so on. Another was S. H. Baker, the best man who ever painted landscapes on glass for the lantern. J. Smith and Thomas Clare were other noted slide painters of the past, so also was Charles Simpson, a miniature and portrait painter by profession, who subsequently became blind. Lastly, C. Constant, the painter of comic slides, should be remembered; he has made himself immortal by devising the world-wide famous slide of the sleeping man swallowing endless processions of rats. All these painters have departed this life with the exception of Mr. Baker, who now occupies a high position in connexion with the Birmingham Society of Arts. Kearnan and Simpson were interred by the late William Westley in the same grave in Brompton Cemetery.

Messrs. Carpenter & Westley introduced the crescent form of dissolver, in which a crescent was cut out near the circumference of a circular disc; it gets rid of the shadows on the picture cast by opaque dissolvers. Philip Carpenter, the founder of the business, materially helped Sir David Brewster in the invention of the kaleidoscope. A few days ago I had the pleasure of meeting in the establishment a nephew of each of the founders of the firm, from whom the particulars herein given in relation to its history were obtained. They have about 12,000 slides on the premises, some of them by departed artists, whose productions they will not now part with on any terms, and all people connected with the lantern trade agree in telling me that photography has killed lantern-slide painting as a fine art.

W. H. HARRISON.

(To be continued.)

THE CRYSTAL PALACE PHOTOGRAPHIC EXHIBITION.

An exhibition of photographs and apparatus will be held in the Crystal Palace, commencing Monday, February 20, 1888. We make such an extract from the rules and regulations as will enable our readers to become acquainted with the conditions under which they may exhibit.

All goods or pictures for exhibition must be delivered, carriage paid, on or before Saturday, February 11, 1888, addressed to the Executive Committee, and bear, in a distinct manner, the name and address of the sender, together with the number of table or space assigned to the exhibitor. The committee reserve the right to refuse any exhibit, without stating any reason for so doing.

No exhibit shall be removed until the close of the exhibition, immediately after which each exhibitor must pack and remove his goods at his own expense. The executive reserve to themselves the right of doing whatever they may consider necessary, at the expense of the exhibitor, unless this regulation is strictly complied with.

No sales shall be allowed to take place during the exhibition, nor may photographs of the Palace or grounds, or any part thereof, be taken, but orders may be booked for duplicates of any exhibits.

In the apparatus division, tables or floor space will be provided for exhibitors 16 ft. by 12 ft., which will be subdivided to suit requirements into spaces of 16 ft. by 6 ft. or 8 ft. by 6 ft., for which a charge will be made of 1s. 6d. per square foot. No exhibitor will be allowed to transfer any portion of the space allotted to him, or to allow any other than his own duly admitted exhibits to be placed thereon, without the consent of the committee.

In the art division a fee of 2s. 6d. per frame (irrespective of size) will be charged. No Oxford frames will be admitted.

Photographs coloured by artificial or mechanical means will be excluded, except under class C, section 4.

Reasonable care will be taken to protect exhibits, but neither the directors nor the Executive Committee will be responsible for any loss or damage arising from fire, accident, or any other cause.

A non-transferable admission ticket will be supplied to each exhibitor, and, in the apparatus division, to an attendant where necessary, which will pass the holder into the Palace without payment on each day of the exhibition.

No exhibitor will be allowed to display his goods or name-board (which must in every case be placed longitudinally with the nave), to the annoyance or detriment of other exhibitors, and the directors may require the removal of any obstruction, or anything which in their judgment contravenes this rule.

No substance of a dangerous or explosive nature shall under any circumstances be exhibited.

Awards will be made in each class, provided the judges deem any exhibit or exhibits of sufficient merit. From the decision of the judges there shall be no appeal.

All correspondence and inquiries to be addressed to the Executive Committee of the Photographic Exhibition, Crystal Palace, S.E.

Applications for space must be made as above, and the forms filled up and returned before Saturday, February 4, 1888.

Regulations and other information respecting the competitive lantern entertainments which will take place during the exhibition may be obtained from the committee.

These regulations, with one or two omitted, are signed by S. G. Buchanan Wollaston, W. H. Hyslop, and J. F. Peagood, who form the Executive Committee.

Space does not permit us this week to give the divisions and classification of the exhibits. These in our next.

NOTES FROM ABROAD.

(From our Special Correspondent.)

V.

BELOIUM AS A FIELD FOR THE CAMERA.

In my last some particulars were given about Louvain, the capital of South Brabant; its glory now contains but 35,000 inhabitants, whereas, in the days of its glory in the fourteenth century, it had 140,000. Its history dates back to the Roman period. The country surrounding it is flat, and its chief photographic subject, the City Hall, has been much "done" by photographers; in London it is represented in commercial lantern views. The chief thing I saw in Louvain, of interest to a professional photographer, was one likely to take his breath away, namely,

the following announcement in some of the shop windows:—"Cartes-de-visite 1s. 3d. per 100, in ten minutes." Gradually, however, the light may dawn upon him that the name of *carte-de-visite* for a photograph is a stolen one, and that it originally meant what it says, namely, "visiting card."

To Liège, a distance of between forty and fifty miles, the country is gently undulating, and cultivated to its utmost capacity of production by peasant proprietors. Here and there a gentleman's château is seen, with grounds, and sometimes ornamental waters, of moderately limited extent. Liège, the chief seat of the iron trade of Belgium, lies down in the valley of the Meuse, and the railway approaches it down a long, steep, and expensive incline. No city is more libelled in English guide-books than Liège. It is almost invariably described as a place of fires and forges, surmounted by a grimy canopy of smoke. The *Practical Guide*, published by Trübner & Co., is dated 1887. Its editor says:—"The primary feature which distinguishes these 'Guides' is—*They are altogether based on personal experience.* . . . They indicate nothing that has not been personally verified." Of Liège it says: "Iron foundries, for firearms, printing presses, steam engines, &c., flaming in all directions. . . . To Namur, 1½ hr. or steam." In this book the words "or steam" are always employed to denote steamboats. As a matter of fact the steamboats between Liège and Namur have ceased to run for at least five years, and instead of Liège being a place of flames, forges, and iron foundries, I saw in it neither flame nor smoke. Bath and Brighton are more smoky than Liège, doubtless because the Belgians burn their fuel in a rational manner, do not waste three-fourths of the heat up the chimney after paying for it to the coal merchant, neither do they waste the unburnt fuel called "smoke," and at the same time pollute the atmosphere therewith. The region of fire, and smoke, and forges is at Seraing, a few miles up the river from Liège. The latter is a beautiful city, laid out with boulevards, gardens, squares, and ornamental waters, with an atmosphere so clear that, when photographing in the middle of the town, the cottages on near and distant hills would come out sharp and crisp in the picture when the weather is fine. At the end of September, when fires were coming into use, I saw no haze due to smoke. An average London atmosphere is pea-soup compared to that of Liège. So much for guide-books, for the one just quoted is not an exceptional case, but makes most claims to extreme accuracy. The editor has a lively style of writing.

Among the chief features of Liège, from a photographic point of view, is the Palace of Justice, built in 1583 by the Cardinal-Bishop Erard de la Marck. It has a colonnade with pillars somewhat in the Moorish style; anciently the place was the residence of the Prince-Bishops. Another remarkable specimen of architecture is the interior of the Church of St. Jacques, date 1513. In exploring the west end of Liège I came, alongside the Church of St. Anthony, upon a feature not described in guide-books. It was a stone staircase about as wide as the Strand in London, but it went up, up, up, until church spires were left far below—up, until the people at the top looked no higher than umbrellas. Here was something to be explored. When less than half-way up, the spires and turrets of the highest buildings in the city were below the observer, and at the top of the staircase was a *café* called "The Mountain Rest." It turned out to be a staircase upon the side of a steep hill, at the top of which were some of the fortifications of Liège. What lens would do justice to this staircase?

A new departure, I think, might be made in tourist photography by the traveller training himself, not so much to take views of celebrated places, which local photographers, at all events, have obtained already, but to complete various series of pictures, illustrating manners, customs, and events foreign to his own country; then, on his return, by the optical lantern or otherwise, he should convey to others the information which he himself has gained. In Liège, some of the most foreign-looking things I saw were the scaffoldings used in building and repairing houses. These scaffoldings were variously built up, and are indescribable without photographs. In one place I saw a house in a main street undergoing extensive repairs. All the front wall and front rooms had been removed, leaving the roof and back rooms standing. In the cavern thus created a new shop and front rooms gradually arose. As the wanderer wends his way southwards in Europe the scaffoldings grow more mysterious, until in Switzerland they are made so that barrows can be wheeled from the bottom to the top up zigzag inclined planes, built on the principle of the zigzag roads up steep mountains. At Berne, in addition to these novelties to an Englishman, the builders have a special way of raising stones and heavy weights. A kind of aquirrel cage is erected high in the air, inside which men perform treadmill exercise, something like aquirrels or white mice. The wheel thus turned works a windlass, by which stones and other things required in the building operations are raised. Things like these should be photographed, and a "yarn" spun about them when exhibiting the pictures at home. The interest of observers of photographs can always be enhanced by a little judicious talk. The pictures are most effective when on a large scale and brightened by the glory of colour, as by means of the painted alidea of the magic lantern.

Here is another un-English subject for the camera. In Belgium, and in some other European countries, the people do not trouble themselves by building much in the shape of railway platforms. Especially is this the case at the smaller stations, where passengers scramble across one line of rails to get into a r upon another line of rails. At large centres of

traffic in Belgium it is also common for, say, half-a-dozen trains to be timed to reach the junction at the same time. They remain perhaps fifteen minutes, during which the passengers "sort themselves," and when all are rearranged in their proper trains, off they go. Liège station-in-chief, with three trains waiting at one end, three at the other, and the passengers thronging the space between at the level of the rails, is a subject for an instantaneous photograph. Pictures illustrating the cheerfulness of *café* life in France and Belgium, and the way in which fathers, mothers, and children enjoy themselves in a homely way at such places, would be interesting in England; but to obtain them the magnesium light would perhaps have frequently to be brought into play. The light-hearted French would in many cases enter into the fun of the thing, and politely pose and sit quietly that the Englishman might take home a memento of the scene. In time, such pictures, accompanied by narratives, will become of somewhat less general interest in England, because statistics prove that the number of English crossing the Channel annually is increasing by leaps and bounds. Only the lack of education has hitherto prevented the average English from mixing up with the leading Continental nations to the same extent that the dwellers in those nations intermix with each other. In Switzerland a young man is not thought to be worth much unless he can speak three living languages in addition to his own, and a wise Government has provided for him facilities for learning them almost gratuitously. Hence, also, they can, and they deserve to, get situations in England where an English youth cannot, they having earned their ascendancy by perseverance and honest hard work in good schools.

From what was said in my last about the necessities of the light-footed photographic tourist who intends to visit comparatively unexplored districts, armed with no more baggage than he can himself easily carry, it becomes evident that the weight of his plates or films becomes of major importance. As to paper negatives, it is admitted that they show grain when they are of lantern-slide size, and are afterwards printed as such for projection; therefore, the tourist who has rare subjects before his camera cannot afford to use paper instead of plates. Stripping films deserve attention, but they have yet, for such work, a good or other reputation to make, and the manipulations are more complicated than those connected with dry plates. If plates should prove to be a necessity, it is also an absolute necessity that they should be of thin glass, which in England has not always been very largely on sale at moderate prices, although Mr. J. Traill Taylor recently discovered an exception in London and Birmingham to this rule. At Liège I called at the University, and found that even in the autumn season its library is open, but for a few hours only, and in the daytime. There I saw in a recent number of the *Bulletin Belge* about experiments in Belgium with the Balagny films, which, from reports in French newspapers, would seem to be as good and transparent as glass plates, and nearly as simple in manipulation. The only objection to them which, so far, has come before the public in England is their high price. It seems to be time that their merits and demerits should be exhaustively tested and reported in this country. The number of the *Bulletin Belge* aforesaid stated that M. Lunsden had given a demonstration of the working of these films before the Belgian Photographic Association. The developing bath he used had a glass bottom, so that when he poured off the liquid he could hold the bath and negative up to watch by transmitted light the progress of the development. The films were also strong enough to bear turning over by hand, while wet, to examine the progress. In order to expose them in the camera they were mounted temporarily upon ferrotype plates, which had previously been thinly coated with a warm solution of gelatine and glycerine. To this film, when cold, the films adhere lightly, and the coating serves to hold several films in succession without renewal of the adhesive material. The films are easily detached. In the course of the evening a picture of the members of the Association was taken upon one of the films by the aid of the magnesium light. A slight foginess in the negative was supposed to be possibly due to magnesium smoke or to tobacco smoke, though how the latter came to be present at a meeting of a scientific society is not stated by the *Bulletin Belge*. Thus, the hope of the pedestrian tourist seems to lie—1, in Balagny films; 2, in stripping films; 3, in gelatine emulsions upon thin glass; 4, in getting small batches of thin glass gelatine-emulsion plates sent to meet him at various places by parcels post, and sending home small batches of his finished negatives at the same time. Of these plans, perhaps the first and last are the most promising.

PHOTOGRAPHY IN 1887.

[A Communication to the Yorkshire College Photographic Club.]

I PROPOSE with your permission to classify what I have to say under three heads, namely, progress during the past year; the present position and utility of photography; the claims of photography to rank as a creative art.

A considerable amount of evidence has been accumulated with reference to both the principles and practice of orthochromatic processes, and it may fairly be claimed that the value of these processes has been clearly established, although very much still remains to be done before the methods can be regarded as approaching perfection. For the repro-

duction of paintings orthochromatic methods have become indispensable, and the excellence of the results obtained, when they are combined with photogravure, is truly remarkable. In photographing pottery, flowers, and similar subjects, the advantages are likewise very strongly marked. A more extended series of experiments on the use of plates prepared with erythrosine for landscape work confirms the conclusion previously expressed, that the gain over the ordinary process is more considerable than might be expected from general considerations, whilst at the same time it is much more strongly marked with some subjects than with others. The improvement is most noticeable in the rendering of foliage, water, and distance. The masses of foliage are bolder, and trees of different colour and character are much more clearly distinguished. The distance is rendered more clearly especially during the prevalence of that almost imperceptible blue haze which is frequently so troublesome, whilst at the same time the atmospheric effect is not lost if care is taken not to use a screen of too deep a tint. The gradations of the water are softer and more pleasing, and the reflections, usually so difficult to render, are obtained in a satisfactory manner. Erythrosine is still the most powerful known sensitiser for the less refrangible rays, and is the most useful for general purposes, whilst cyanin is unsurpassed for subjects which contain much* orange and red. Mr. Wellington has recently introduced certain modifications by means of which he is able to increase the stability of the cyanin and the plates prepared with it.

The most noteworthy improvement in the methods of photo-mechanical printing is Husband's *Papyrotint*,† a method of photo-lithography in half tone, the necessary grain being obtained by means of potassium ferricyanide. The transfer paper is first coated with gelatine containing glycerine and a considerable proportion of common salt, and then, after drying, with gelatine containing potassium bichromate salt and a considerable proportion of potassium ferricyanide. After exposure the transfer is treated with water, inked, and transferred to stone. The character of the grain can be modified by altering the proportion of ferricyanide, drying at a higher or lower temperature, and varying the temperature of the water with which the transfer is treated. Even a fine-grained transfer will yield as many as 1200 copies. The results are very satisfactory.

A discussion as to the relative permanence of prints produced by different methods has naturally excited considerable interest, but has been characterised by a considerable amount of reasoning based on false analogies, and the display of an inadequate knowledge of chemistry on the part of otherwise able and skilful photographers. Without at present entering into the question in any detail, it may be useful to point out that a print produced on albumenised paper in the usual way is something totally different from a print produced by development from an emulsion, and the properties and reactions of the one afford no guide whatever as to the probable behaviour of the other under similar conditions.

A most important contribution to the science of photography has been made by Carey Lea, whose papers have been reprinted in most of the photographic journals. His investigations deal mainly with the nature of the invisible or latent image. The two theories which have hitherto divided photographers on this question are generally known respectively as the physical theory and the chemical theory. According to the first the light waves impinging upon the silver salt throw the molecules into such energetic vibration that the molecular structure is very nearly shattered, or, in other words, the attraction of the silver for the chlorine, bromine, and iodine is so far overcome that the developing solution is able to complete the destruction of the molecule by removing the bromine and leaving the silver in the metallic state. According to the chemical theory, the light waves acting on the silver salt in presence of moisture, organic substances, &c., decompose it, splitting off half the chlorine, bromide, or iodine, and leaving a sub-chloride, sub-bromide, or sub-iodide. This sub-salt is at once attacked by the developer, and the metallic silver thus formed constitutes the nucleus upon which the image is built up by the subsequent action of the developer.

C. H. BOWMANLEY, F.I.C., F.C.S.

(To be continued.)

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 17,296.—"A Registering Photographic Printing Frame." W. H. PRESTWICH.—*Dated* December 16, 1887.

No. 17,341.—"A Combined and Portable Automatic Apparatus capable of Exhibiting at Day or Night a Series of Views, Photographs, Pictures, or other Matters of Public Interest consecutively." Communicated by V. BONNET, H. LISSAGARAY, ARMAND RICHARD, and ALFRED RICHARD. G. HUGHES.—*Dated* December 16, 1887.

No. 17,461.—"Improvements in the Modes of and Means of Apparatus for Taking and Producing Photographs and in Appliances connected therewith." J. HILMES, E. HOWELL, and A. HOWELL.—*Dated* December 19, 1887.

* *Photographic News*, 1887, p. 693.

† *Photographic Journal*, p. 126.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
December 27.....	Great Britain (Technical).....	5A, Pall Mall East.
" 27.....	Bolton Club	The Studio, Chancery-lane, Bolton.
" 28.....	Burnley and District	
" 28.....	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
" 29.....	Liverpool Amateur	Royal Institution, Colquhoun-street.
" 29.....	Oldham	The Lyceum, Oldham.
" 29.....	London and Provincial	Mason's Hall, Basinghall-street.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday, December 15, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. A. Haddon presided.

Letters were read from Mr. Charles Blackburn, of Didsbury, Mr. J. L. King, and Mr. P. Fincham, expressing regret at being unable to attend at the reading of the paper.

Mr. W. H. HARRISON read a paper entitled *Historical Notes on the Optical Lantern* [see page 809].

The HON. SECRETARY announced that the discussion of the paper would be postponed until the last Thursday in January.

Mr. W. ENGLAND said that when architectural photographic lantern slides first came out they gave curved lines on the screen at the Polytechnic Institution, the managers of which, consequently, had lenses for projection specially made by Dallmeyer; that was fourteen or fifteen years ago.

Mr. J. TRAILL TAYLOR remarked that at least twenty-five years ago photographic lenses were used in conjunction with the lantern; at the very foundation of the Photographic Society of Edinburgh he read a paper and used achromatic lenses in the lantern. In the last ALMANAC would be found much about lantern condensers and the best methods of intensifying the light by an extra lens and otherwise.

Mr. E. M. STOKES stated that a living painter of the old school of lantern slides, Mr. Hill, had not been mentioned in the paper, nor was Henry Gardner mentioned. The latter is good at landscape painting and general work on slides; he now lives at Birmingham. He remarked that some of the best lantern slide painters of old had been short-sighted, which for such work seemed to be an advantage.

Some historically interesting lantern slides, painted before the days of photographic slides and by the artists mentioned in the paper, were then exhibited for Messrs. Carpenter & Westley by Mr. E. Manning Stokes, a nephew of the late William Westley, and by Mr. T. B. Matthews, a nephew of the late Philip Carpenter. Among these slides was the original one of the man swallowing rats, also the improved form of the same picture subsequently devised by the original artist. One of the exhibited slides of former times had been very delicately painted by a Dutch artist, name now forgotten.

Mr. W. M. Ayres exhibited some unmounted prints on albumenised paper twenty-five years old; they had been toned and fixed in the old hypo and gold bath, and are still in good condition—pure in the whites and deep in the blacks.

Messrs. A. C. Edwards and E. J. Platt were elected members of the Association.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

A COMMITTEE meeting was held on the 15th instant, when the following were elected members of the Association:—Messrs. E. Darlington, A. R. Dresser, F. R. Greenslade, J. Hendrie, W. J. Humphreys, E. A. Rice, E. N. Smart, E. Sampson, Mipess, Coslett, Hawker, Reddy, and Sisman.

Four urgent cases were considered, and substantial assistance given.

Messrs. W. J. Humphreys and H. J. White were elected members of the Committee.

Mr. W. M. Aslman resigned the Chairmanship of the Committee owing to his business necessitating his leaving London.

Mr. W. Bedford was unanimously elected to fill the vacancy.

The meeting then further considered the preliminary stages for the inauguration of the Orphan Fund.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE annual dinner of this Association was held jointly with the Birkenhead Association, in lieu of a general meeting, on Thursday, the 15th instant, at the Neptune Hotel, Liverpool.—Mr. George H. Rutter, President of the Liverpool Association, in the chair.

The party numbered about thirty-two, and a pleasant and social evening was spent.

In the course of the dinner a demonstration took place of what was styled a *New Royal Wet Process*, by Mr. J. B. Sayce, in which the vincous juice played an important part. This process, which is strongly recommended to amateurs convivially inclined, was highly approved of, the only drawback appearing to be its want of permanency.

After the usual loyal toasts, the succeeding toasts were, "The Photographic Associations of Liverpool and Birkenhead," responded to by Mr. J. H. Day on behalf of Birkenhead, and Mr. W. A. Watts on behalf of Liverpool; "Mr. B. J. Sayce, President-elect for Liverpool," proposed by Mr. B. Boothroyd; "The Prize Winners for 1887," proposed by Mr. H. N. Atkins, responded to by Messrs. Beer and Lewis.

During the evening songs were sung and pianoforte selections given by Messrs. Miners, Beer, W. and F. Falhin, Day, Tomkinson, Bowman Ralston,

and James Ralston, which added greatly to the pleasure and conviviality of the evening.

In the course of the proceedings a collection was made on behalf of the family of the late Mr. Jennings, which resulted in the sum of 34 0s. 6d. being added to the fund.

WALLASEY PHOTOGRAPHIC ASSOCIATION.

THE usual monthly meeting of this Association was held at 12, Bradford-terrace, Seacombe, on Wednesday, the 7th instant.—Mr. Wilkinson in the chair.

Messrs. J. Gill, H. B. Sharpe, E. Simnett, and Byrom, were duly elected as members.

The taking of instantaneous photographs by night was then discussed, and the various methods recently mentioned for the instantaneous ignition of magnesium were touched upon.

The Chairman afterwards exposed two plates on a group of the members, using as an illuminant in each case a few grains of gunpowder (not having gun-cotton at hand) and about fifteen grains of powdered magnesium. The results, so far as exposure was concerned, were very good, and plainly demonstrated that by the aid of reflectors extremely successful portraits may be taken at night in an ordinary room. The objection, however, to gunpowder is that it gives off smoke, an inconvenience which does not attend the use of gun-cotton.

DERBY PHOTOGRAPHIC SOCIETY.

THIS Society held its usual monthly meeting in Sykes's Rooms, Victoria-street, at eight p.m. on Tuesday, December 13.—Mr. R. Keene in the chair.

The minutes of the last meeting having been read and confirmed,

Mr. FRANK COOPER read a paper entitled *Photographic Experiences*, which elicited some discussion, Mr. Cooper answering a number of questions put to him on the subject; and he was accorded a hearty vote of thanks.

The CHAIRMAN announced that the annual *conversazione* would be held on January 11, 1888, in the Lecture Hall, when there would be an exhibition of photographs and lantern slides, also demonstrations of photographic printing processes, &c.

It was decided to inaugurate an annual supper, to be provided in the Society's meeting room, upon a date to be fixed during January.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE last meeting of this Society was held at 36, George-street, December 8, 1887.—Mr. Abel Heywood, jun., Vice-President, in the chair.

The minutes of the previous meeting read and confirmed, Messrs. Charles F. Brennan, Warwick Brooks, Alfred J. Bailey, S. Herbert Fry, and M. Pogson, were admitted members.

Mr. ABEL HEYWOOD, JUN., read a short paper on Pumphrey's films, which he had tried a considerable number of during the past summer in Norway. The size he used was quarter-plate, for lantern transparencies. Mr. Heywood stated that though he might be satisfied with the films for silver printing he would not venture on using them again when on a distant expedition, especially if he had lantern transparencies in view. The objections he found to them were that he did not obtain the same refinement of focus as on glass, and the films were much more liable to flaws and blemishes. He exhibited a number of film negatives, with silver prints and transparencies from the same, also silver prints and transparencies from glass negatives taken on the same expedition. Mr. Heywood also exhibited a coloured portrait of himself, taken by Mr. Mayall, London, and coloured by his patent process.

Mr. JOHN SCHOFIELD read a paper and gave a practical and successful demonstration of making lantern slides and bromide enlargements by artificial light [see page 794 in last week's JOURNAL].

The Hon. Secretary exhibited on behalf of Messrs. Ross & Co. an instrument called the "Cumioscope," for viewing single photographs, and it is claimed that the concave mirror of the instrument magnifies and produces an effect almost equal to stereoscopic. However, the opinions expressed on this instrument were not over favourable.

The Hon. Secretary also exhibited a stereoscope and a number of stereoscopic slides which had been sent by Mr. Harding Warner. The slides were considerably larger than the old form, the photographs being five inches and a half in height by three inches wide, mounted side by side on six-and-a-half-inch square card mounts. These were passed round and examined by the members, and a discussion followed upon the advantages or disadvantages of large-size pictures for the stereoscope.

Mr. W. BLAKELEY could not agree with the Hon. Secretary (Mr. Chadwick), who had stated there was no advantage in large pictures for the stereoscope. He was quite sure he could get a great deal "more subject" on his 7½ x 4½ plates than Mr. Chadwick could on his 6½ x 3½ plates.

Mr. CHADWICK said "more subject" or "amount of subject" was a very unscientific term; angle of view would be far better understood. If, then, a four-and-a-half-inch lens was used on a four-and-a-half-inch plate, and a three-inch lens used for a three-inch plate, the "amount of subject" would be the same in each case, because the angle of view would be the same. The correct way to view a stereoscopic picture was at the same angle at which it was taken; we should then get apparent natural size. Mr. Blakeley had advocated cutting stereoscopic pictures three and a quarter inches wide and mounting them three and a quarter inches apart; in that case few people would be able to see them comfortably, and if we could not see them easily and with pleasure they were not worth looking at at all; but even in Mr. Blakeley's own case, as he had asserted "he could see them *very well*," the picture must be further from the eye than the ordinary distance, and so their size would be reduced. It was quite easy to see a stereoscopic slide four inches deep (or in height), but three inches wide was the limit for the width. For his own pleasure he preferred

one good transparency to a dozen paper slides; he, therefore, did not make paper slides, and anything larger than three and a quarter inches in depth for transparencies would be too heavy and clumsy, &c. When he required "more subject," or greater angle of view, he used a short-focus lens, and three inches was short enough for most purposes in stereoscopic work.

Mr. THOMAS CHILTON promised to bring to the next meeting a number of stereoscopic pictures taken by himself during the past season.

The CHAIRMAN said he was glad to see stereoscopic photography had taken such firm root in the Manchester Photographic Society.

Mr. SCHOFIELD (the Librarian) made a short report of the state of the Society's library.

Mr. J. F. CHAPMAN presented for the Society's library a large collection of modern books on photography.

The Hon. Secretary presented a copy of Vogel's *Progress in Photography* (American edition), and many others were promised by various members.

Mr. A. BROTHERS called attention to the fact that the November meeting was held on Wednesday, November 9, instead of the usual second Thursday, November 10, and spoke of the undesirability of changing the dates of meetings.

The CHAIRMAN acknowledged the undesirability of altering the dates, but in this particular instance it so happened that the date for the closing of the Royal Jubilee Exhibition was November 10, and in making the alteration the Council thought they were considering the convenience of the members, as many would like to be at the closing ceremony of the Exhibition.

Mr. BLAKELEY thought with Mr. Brothers it was very undesirable to alter the date of meeting; for himself he had not had the privilege of being at the Exhibition for the closing ceremony, and November 9 was *to him* the last day of the Exhibition; therefore, he was debarred from attending the meeting of this Society, and considered "the whole proceedings of the last meeting ought to be repeated."

The HON. SECRETARY said the date of meeting had only been altered three times in a period of about ten years, and in the present case every member had had nine or ten days' notice of the alteration by printed circular; the meeting which did take place was attended by more than the average number of members, all of whom was congenial and satisfied.

Mr. D. E. BENSON also spoke in condemnation of the alteration of date, and asserted his opinion that the Council had no power in that direction.

Mr. CHILTON thought the subject had been introduced with *very bad taste*. ["Hear, hear," from various parts of the room.]

The meeting was adjourned with the usual vote of thanks.

YORKSHIRE COLLEGE PHOTOGRAPHIC CLUB.

The meeting on December 13 was devoted to a discussion on *Methods of Enlarging*, the President (Mr. C. H. Bothamley) occupying the chair.

Mr. A. E. NICHOLS described the apparatus which he employed for enlarging or reducing daylight. It consists of two stout wooden rails seven feet six inches long, fastened together by crosspieces; on these rails slide three frames, one of which is fitted with a series of carriers for negatives of different sizes, the second carries the lens, and the third is an easel on which the paper or plate can be fixed. A series of flat boards about twelve inches long slides along the rails, and prevents the access of any light from below. Laths pass from the upper part of one sliding frame to the next, and a cloth is thrown over these to keep out the light. The frame carrying the negative is placed against a window, and tilted at such an angle that unbroken sky illumination is obtained.

Mr. C. H. BOTHAMLEY described the usual method of daylight enlarging by means of an ordinary camera, the negative being placed in the camera and fixed against a window, and illuminated by means of a reflector, whilst the enlarged image is produced by the ordinary object being fixed in its usual place in the camera front.

Mr. F. W. BRANSON exhibited and explained a complete form of apparatus for enlarging by means of the oxyhydrogen light. The condenser was nine inches in diameter, and the objective was a Ross' 8 x 5 rapid symmetrical. The condenser was fixed, but the distances of the light and the object from it could be readily adjusted by a sliding motion. The illumination of the field was perfectly uniform as far as the eye could judge, and a half-plate negative enlarged six diameters was perfectly sharp to the corners with a stop $\frac{f}{11}$.

Mr. BOTHAMLEY briefly explained the optical principle involved in using a condenser, and insisted on the necessity of having the light, condenser, and objective always fixed, or of being able to adjust the distances of both the light and objective from the condenser. He pointed out that the ordinary lanterns for projection were not very suitable for enlarging purposes, on account of the small range of adjustment. He also exhibited and described an apparatus for enlarging with either an argand gas lamp or the oxyhydrogen light.

Dr. E. H. JACOB had obtained good results with an argand oil lamp used in ordinary projection lantern, but had found it desirable to adopt some form of apparatus permitting of more ready adjustment. An efficient apparatus can be made out of very simple materials, involving little expense beyond the cost of the condenser, the camera lens being of course used as the objective. He considered that when working with paper it was possible to use a much greater quantity of yellow light than was commonly employed.

In reply to Mr. Whitham, the SECRETARY (Mr. Harry B. Hall) had had experience in the making of enlarged paper negatives which could be used for printing by any process, and had obtained very satisfactory results.

Further discussion of a conversational character followed, in which the previous speakers, the Rev. W. Hancock and Messrs. Whitham and H. Pocklington, took part. There was a general consensus of opinion that if enlarging was done at all, it was not worth while to use anything bigger than a quarter-plate camera in the field; that Eastman paper was uniformly good, and easy to work, and gave excellent results with suitable negatives; but that Morgan & Kidd's paper was more rapid, and gave a better rendering of half

tones when used with negatives which are good printing negatives for other purposes; that when an enlarged negative is required, it is much better to make an enlarged transparency, and print the negative from that by contact, any retouching being done on the enlarged transparency, or negative, or both, and not on the original negative.

The annual lantern exhibition will take place on January 27, 1888, and the annual exhibition of pictures, &c., on February 14 in connexion with the *conversazione* of the Yorkshire College Students' Association.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE second ordinary meeting of the current session was held in the Professional Hall, 20, George-street, on December 7.—Mr. W. Forgan in the chair.

One lady and nine gentlemen were elected ordinary members, and six gentlemen were nominated for election in January.

Dr. ALEXANDER HUNTER made some descriptive remarks upon places in the Highlands which he had recently visited, and where good subjects might be had for exposures when members were holidaying in the north. He gave a good idea of the spots he referred to by handing round a considerable number of large water colour sketches made by himself during the past summer.

This being the occasion when the annual exhibition of members' work takes place, a large and interesting collection of prints were arranged upon the walls. This year the exhibits were not so numerous as on some past occasions, but some very fine technical work was shown, while the picturesque was evidently well kept in view in many examples. Some very good cloud effects were shown, obtained by double printing, which seems to be almost essential where the best results are aimed at. Landscapes formed the bulk of the exhibits, and were well represented in forest, lake, and fell. Several members sent frames of figure studies, which deservedly attracted much attention. They chiefly depicted fishing village scenes, occupations, and life. While there was no direct work of large size exhibited, save in one instance, a number of gelatinobromide enlargements gave pleasing variety to the display. As usual, silver prints constituted the majority of what appeared, and of these the smaller sizes did not fail to hold their own. Not the least interesting and clever, because of the great difficulties encountered in securing them, were the marine subjects hung. In a creditable number of instances the pictures of shipping were admirable, the feeling of breeziness and wava motion being capitally caught. The collection was not confined to members residing in the city, but contributions came from those at a distance as well, even as far as the banks of the Rhine. The largest work shown was a presentation to the Society by Mr. W. Crooke, being a copy in platinum of the group taken on a twenty-five-inch plate at Craigmillar Castle during the late visit of the "Convention" party from Glasgow. It is a very welcome addition to the Society's properties, and will ever be interesting on account of its subject. The frame is the gift of Mr. Thomas Warlale. Mr. Graham, of Derby, presented twelve copies of a remarkable instantaneous picture of a flight of sea gulls, which will be balled for at a future meeting of the Society. A large number of portraits of past and present members were displayed, and the Society's new portrait album was laid open to view. The PRESIDENT invited the members to add to the collection it already contained by prints, if possible, executed in some of the permanent processes.

A number of cameras and dark slides were arranged upon the tables, and were the objects of much inspection during the evening.

Mr. A. H. Baird exhibited a Brown's patent camera and dark slide. A feature in this slide is that it offers a means of taking two pictures upon one plate. When this is desired a dark screen covers half of the space occupied by the focussing glass, the slide is pushed half in and the door half drawn out, after which the second exposure is made by pushing the slide fully home and uncovering the other half of the plate. The sliding front in this camera carries the bellows with it when moved up or down.

Mr. H. Auld showed a Gotz camera which contained several very good points. The power of adjustment of the focus so as to suit widely different lenses is very considerable, and a circular excentric front gives great latitude of movement. The slides are of the "solid" make and beautifully designed. The tripod head seemed of a new pattern.

Mr. E. SHAWCROSS also described his camera, which possessed some useful arrangements in view of portability.

The PRESIDENT intimated the approach of the popular evening season, and urged members to prepare their transparencies in good time. The Council also were making arrangements for a public lecture in Queen-street Hall with lantern illustrations, which would be intimated in the usual course. A distribution of prints at an approaching meeting was also intimated and contributions of prints solicited for the same.

Correspondence.

✎ Correspondents should never write on both sides of the paper.

"ALKALINE DEVELOPMENT."—"A NEW METHOD OF INTENSIFYING BEFORE FIXING."

To the EDITORS.

GENTLEMEN,—In reply to the letter of your correspondent Signor A. Gil de Tejada, referring to my article which appears under the above title in this year's ALMANAC, may I be permitted to state that the second part of the title was selected by the Editor as a description of the process.

I should be sorry to usurp any part of the credit which may be due to Signor Tejada, whose article on *Alkaline Intensifying* in THE BRITISH

JOURNAL PHOTOGRAPHIC ALMANAC for 1880 I had not seen previous to writing my own.

I can only say that if by our united efforts photographers are induced to exchange the present system of development (in case of unknown exposure) for a better and more convenient way of working, I shall only be too glad to yield to Signor Tejada the honour of having been the first to suggest the improvement.

I find on comparing Signor Tejada's method of working with the one I have proposed, that although the theory is the same there is a considerable difference in the means used to effect the desired object. There would also probably be, in many instances, a very material difference in the practical results.

One of the distinctive features in the method I have described is the enormously increased latitude which it allows in the exposure. This was recently demonstrated at the Photographic Club, when a good printing negative with clear shadows was easily obtained on a plate which had received twenty times the normal exposure, *the fact that the plate was over exposed being unknown to the operator before commencing development.*

This method of developing a negative so as to obtain detail first and density afterwards, is simply an adaptation to the alkaline development of gelatine plates of the old method of redeveloping or intensifying before fixing which was commonly used in the wet collodion process. It seems not improbable, judging from the results obtained, that the modification now proposed will prove equally useful in the gelatino-bromide process.—
I am, yours, &c.,
B. J. EDWARDS.

The Grove, Hackney.

MOUNTS.

To the EDITORS.

GENTLEMEN,—In reference to the paragraph on p. 788 of present week's issue of THE BRITISH JOURNAL OF PHOTOGRAPHY, which mentions a probable difficulty in getting mounts through with the photographer's name on same, I think that if an imprint is added at foot of card as follows, "Manufactured in Berlin (or Paris) for J. Fallowfield (or others) as a foreign product," it would fully cover any possible objections the Custom House might raise.

It might be mentioned that it is now generally known these goods are of foreign manufacture, and I also know the authorities have been made aware of this fact, as I had two cases stopped by the Customs because they bore the imprint, "Fallowfield, London," but they were released after a delay of about fourteen months. This I take to be an admission of admissibility of these goods as recognised articles of foreign make, and that no deception was intended.—I am, yours, &c.,

H. WHITE (pro J. FALLOWFIELD).

35 and 36, Lower Marsh, and 86, Oakley-street, Lambeth, S.E.,
December 16, 1887.

THE PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—I have just read your report of the proceedings at the last meeting of the Photographic Society of Great Britain, and regret very much that I was unavoidably absent, as I might have saved the President from the extreme annoyance—to use a gentle expression—to which he was subjected, by making the statement which I will now, with your permission, lay before your readers.

At the meeting on November 8 I read out as usual the name and address of each candidate for election, with the name of the member proposing him from personal knowledge. The Chairman then stated, as usual, that all the candidates would be balloted for *en bloc*, but that if there were any considerable number of black balls (one in five excludes) a ballot would be taken for each candidate separately. The attendant then took round the ballot box, and while the voting was in progress Mr. Wollaston handed me a card with the following words written in pencil, "— is a mistake," naming one of the candidates. I at once got up, followed the attendant, took from him the certificate of the candidate in question, and not seeing any mistake in it I showed it to Mr. Wollaston and asked him what was wrong. He then told me that he objected to the candidate. I said, "Ob, is that it; well, then, put in your black ball," or words to this effect. He replied that the ballot box had already passed him. Subsequently, after the Chairman had opened the ballot box, and finding no black balls at all had declared all the candidates duly elected, Mr. Wollaston complained that sufficient notice was not given that the candidate in question was about to be balloted for. It was suggested by some one that the candidates' certificates should be posted up beforehand so as to give members an opportunity of examining them. General approval was expressed of this plan, and the matter then dropped.

In what I have here stated I wish to emphasise the fact that no protest of any kind reached me *before* the ballot began; that after it had begun, Mr. Wollaston left his seat and handed me a card bearing the four words quoted above, and that I took them to imply some clerical error in the candidate's certificate. No one could suppose at first sight they were

intended as a formal protest against his nomination, and I submit that they do not constitute a protest at all. I wish further to say that the system of election of candidates which was followed on this occasion was that which has always been in use in this Society, and that there was no attempt to hurry them through. The names were, I think, read out sufficiently clearly for every one to hear, and several minutes elapsed between the time of naming the candidate in question and the ballot being started.

Mr. Wollaston is reported to have said at the last meeting (December 13) that he handed in a written protest to Mr. Cocking, written in ink in his presence, an hour before the meeting (on November 8) began. It is impossible to prove a negative, but Mr. Cocking has accounted to me for the whole of his time after five o'clock on that evening, when the Exhibition closed, till 6.45, when the Council meeting began at which all the candidates' certificates were signed. At eight o'clock the Council adjourned for the meeting upstairs, and Mr. Cocking assures me he has no recollection of seeing Mr. Wollaston at all till then, or of receiving any document from him. It should be noted also that Mr. Wollaston asked a question of the proposer of the candidate he objected to, implying a doubt as to his identity, *after* the ballot was over.

I am glad that the majority of the meeting on December 13 regained sufficient confidence in the honesty of the President and Secretaries to rescind their hasty vote, even in the absence of the above statement of facts.—I am, yours, &c.,
W. F. DONKIN, Hon. Secretary P.S.O.B.

December 17, 1887.

RE THE "PERFECT" PHOTOMETER.

To the EDITORS.

GENTLEMEN,—Our attention has been called to a letter from Messrs. Marion & Co. in your issue of the 16th instant, and in fairness to ourselves and to the Stereoscopic Company, who make their statements upon facts given them by us, we must explain that we are the sole licensees of Decoudun's photometers since September 23, so far as England is concerned, having a legally signed agreement between Decoudun and our representative in Paris to that effect, upon consideration of our taking a certain large quantity. This being the case, we offered the sale of this article to the London Stereoscopic Company for London and to other important houses in the country, on the conditions of their likewise taking from us considerable quantities to retain in their hands the exclusive sale in their districts. Decoudun has further undertaken that he will not sell to any other house shipping to England, and if he finds that any sold by him to commission houses are sent to England he will discontinue supplying such houses.—I am, yours, &c.,

A. STALEY (pro CHARLES, REYNOLDS, & Co.).

26 and 27, Milk-street, Cheapside, London, E.C., December 19, 1887.

N.B.—As stated by Messrs. Marion & Co., Decoudun, Paris, is the maker, and, further, the Stereoscopic Company have never sold one without his name being upon it.

To the EDITORS.

GENTLEMEN,—With regard to Messrs. Marion & Co.'s letter in your issue of the 16th regarding the "Perfect" Photometer, we quite admit that the inventor is M. Decoudun, of Paris—not *Decaudesor*, as they state—and that the patentee's name is duly stamped on every photometer we sell. As to their statement that they hold stock of it, we immediately called upon Decoudun's licensees here, who had guaranteed us exclusive sale for London, for an explanation as to how any other London firm could have acquired any, and they stated that so far since the date of their license no firm except ourselves had received any deliveries, and that if any had reached this country since the date of their license for Great Britain they must have been obtained in controvention of the express arrangements made with M. Decoudun. As we have secured the sole license for London, we are only following the usual custom of advertising it as our speciality. That the principle of its use should have been suggested by others, as they state, so far back as 1884, only shows how long a good idea may lay dormant until some one is smart enough to take it up.—
We are, yours, &c.,

THE LONDON STEREOSCOPIC AND PHOTOGRAPHIC COMPANY, LIMITED.

54, Cheapside, London, E.C., December 20, 1887.

Exchange Column.

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

Will exchange 7x5 wide-angle rectilinear lens for half-plate "Optimus" rapid rectilinear.—Address, E. BULL, 90, Sunner-road, Peckham, S.E.

I will exchange a binocular lantern in mahogany case, with brass front, jets, and dis-solver, for a 12x10 camera with three or more double slides of good make.—Address, J. K. TOWNSEND, Woodbine Villas, Carrington, Nottingham.

Answers to Correspondents.

* * All matters for the text portion of this JOURNAL, including "Exchanges," must be addressed to "THE EDITOR," 2, York-street, Covent Garden, London, W.C.

Communications relating to Advertisements and general business affairs to "H. GREENWOOD & Co.," 2, York-street, Covent Garden, London, W.C.

PHOTOGRAPHS REGISTERED:—

J. Stuart, Glasgow.—Photograph of R. B. Cunningham Graham, Esq., M.P.

A. F. McKenzie, Birmingham.—Photograph of the Right Hon. A. Peel, M.P., Speaker of the House of Commons.

* * TOO LATE.—In our next number, and also in that for January 6, 1888, we shall publish a list of societies which have elected their officers for the ensuing year since the date of our going to press with the ALMANAC.

RECEIVED.—J. M. F.

J. R.—See leading article in ALMANAC.

C. W. W.—Dried blood albumen may be obtained at most drysalters or dealers in dyers' or calico printers' materials.

J. T. D.—I. By proper treatment the grain of the paper will not show.—2. The lens will not answer well; a common French portrait lens will be preferable.

A. F. M.—In vignetting an enlargement the vignetting mask must either be placed very much out of focus or be kept in motion during the exposure. The latter is the preferable way.

WILLY EDELSTEIN.—England, Brothers, 7, St. James's-square, Notting Hill, publish Wilkinson's treatise on photo-lithography and kindred processes. This is the only one in the English language.

J. O. V.—The plates mentioned will prove quite rapid enough for every purpose. The light in Egypt will at the time of your visit equal that at mid-summer in this country. But little trouble will be given by the Customs officers.

H. C. S. inquires as follows: "Would you please say if shadows on a wall caused by the sun or any bright light are capable of being developed, or if there is any reason to suppose they can be? The wall is of ordinary stone or papered, but not prepared in any way."—According to the present knowledge of the photographic art, the answer is in the negative.

THE "HALF-INCH" PINHOLE.—G. B. B. writes:—"Seeing that Mr. Forgan has not come forward with an explanation as to the monstrous—nny, Brobignagian—pinhole he recommended in his paper to the Edinburgh Society, might I suggest that a hole the four-hundredth part of an inch in diameter was meant instead of the appalling one mentioned?"

JUSTICE writes:—"Referring to your article on the new film in last week's JOURNAL, it appears to me from your description, and from specimens I have seen, to be the same thing as exhibited at the Camera Club some fourteen months ago as the invention of a Mr. Froedman, of Dublin. If so, surely a word of credit is due to the inventor, who has worked many years to bring it to perfection."

A. E. EMEN.—The size proposed for the studio is very circumscribed. Twelve feet is much too short. Better increase the length to at least eighteen feet by removing the fowlhouse shown in the plan. If this be done have the two ends of the building and the south side opaque. The north side should be glass, except about four feet at either end; then the sitter can be placed at the east or the west end as occasion may require.

R. (Dublin) writes:—"In your issue of the 16th instant you draw attention to a new film as a basis for photographic negatives, from the reading of which one would suppose that the 'gelatinous preparation' which has been substituted for the translucent paper is the invention of the manufacturer, whereas it should have been stated that the inventor and patentee is Mr. Froedman, of Dublin (who has devoted much time and labour to attain this object)."

SPECIAL X.—If you wish to secure greater rapidity in your plates than you are now obtaining we should recommend you to keep to the formula you are employing, but to boil for a longer time. You must, however, bear in mind that in going for excessive rapidity you will probably encounter greater difficulties in working. To obtain the greatest sensibility in plates while retaining their other good qualities taxes the skill of our most experienced plate makers to the utmost.

D. MC.—The cost of a provisional specification is 1*l.* only, and that of a patent, together with the provisional specification for four years, 4*l.* This is the cost if you take out the patent yourself. Of course, if you do it through a patent agent there will be his charges in addition. These are sometimes well incurred if the invention is likely to become an important one, as a layman does not always state the claims in the way they should be stated. Patents are often invalid through the claims being improperly put forth.

APPRENTICE asks: "Will you kindly give me a recipe for mounting bromide prints on paper about the thickness of foolscap without cockling? I have some, cabinet size, to mount on circulars."—"We fear there is no way of absolutely avoiding cockling except, perhaps, making the paper and the print equally wet and then mounting them in that condition with starch. If the paper cannot be wetted then the best plan will be to mount the prints dry with a solution of gelatine containing a large proportion of alcohol.

F. S. C. (Bordeaux) writes as follows: "1. Could you tell me if, by boiling one hour by Abney's formula, and after digesting at a low temperature with the small quantity of ammonia Abney recommends, it will give the rapidity of Beernaert's plates?—2. Does the augmentation of iodide in the emulsion give rapidity? Is there a secret as to rapidity?—3. What would be the cost, about, of a small coating machine installation?"—In reply: 1. We have had no experience with the plates named, so cannot say; but great rapidity can be obtained by the method indicated.—2. Opinions are somewhat divided as to whether iodide increases the sensibility or not. The only secret is skill and experience on the part of the maker.—3. This depends upon the particular machine. Our correspondent should obtain prices from the different manufacturers.

S. M. writes as follows: "Recently there has been a good deal in THE BRITISH JOURNAL OF PHOTOGRAPHY about mounting photographs on glass, which leads me to inquire if photographs could not be mounted on glass simply by putting them on when wet, then applying the squeegee, without any mountant whatever? Sometimes when copying unmounted photographs I have put them while wet behind glass, and had to be careful not to let them dry on, to prevent adherence to the glass. That leads me to think the same plan might be adopted in mounting "Rives," &c. Be so good as to give your opinion on it."—We are fully aware that prints on albumenised paper if allowed to dry in optical contact with glass, with water only as a medium, are very difficult of removal; but whether this system of mounting would answer as well as the usual one with gelatine we, from personal experience, are unable to say. Perhaps our correspondent will give the plan a trial and give us the benefit of his experience.

THE JENNINGS'S FUND.—Collected at a dinner of the Liverpool Amateur and Birkenhead Photographic Associations, and remitted by the President, 3*l.* 6*s.* 6*d.*

PHOTOGRAPHIC CLUB.—The next meeting of this Club will be a lantern meeting, on December 28, 1887. Visitors are invited. Discussion on lantern matters.

CHARLES KNIGHT (Newport) sends us two photographs taken by the Flashing Magnesium Light. One of them is the interior of a smithy, showing the blacksmith at work. This is the best of the flashing class that we have yet seen.

THE LANTERN.—The *Cyclist* Christmas number. Certainly a goodly annual, replete with matters interesting to the cycling fraternity, and having a large number of cleverly drawn comic illustrations. It is published by Hiffe & Son, Fleet-street.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting of this Society will take place on Tuesday next, December 27, at eight p.m., at the Gallery, 5*a*, Pall Mall East. Open at seven p.m. for journals and conversation.

LANTERN SLIDES—A SUGGESTION.—Any one making lantern slides by copying from books, carols, hymn tunes, or music, will find the negative, at least to my mind, a more effective slide than the positive printed from it, the former giving, of course, a dark background with the words, "expressed in burning light."—W. T. F. M. INGALL.

DEAD BLACK FOR LENS TUBES, INSIDES OF CAMERAS, &c.—Trinitrate lamp-black with thin starch either in a mortar or on a piece of glass with a knife, thinning with water to the desired consistency. Mr. F. York says this is a capital and cheap substitute for Indian ink for blocking out or writing on cardboard and stencilling.

The indebtedness of science to photography is one of the themes on which the Astronomer Royal for Ireland is eloquently discoursing in lectures which he is at present delivering in the provinces. As an astronomer Sir Robert Ball could not fail to take notice in this connexion of the remarkable work now being carried on as a memorial of Henry Draper in America. This was enthusiastically acknowledged, at the June *conversazione* of the Royal Society, by Mr. Norman Lockyer, who took great pride in showing some Draper photographs which have been of the greatest aid in spectrum analysis. Mr. Draper's widow devoted all her husband's photographic instruments and an adequate endowment to the continuation of his work, and Sir Robert Ball makes the emphatic statement that the results obtained by Professor Pickering and others are such as to constitute one of the noblest monuments an astronomer could desire. As the Astronomer Royal for Ireland says, some of the faintest and most distant stars have now been analysed with a minuteness and accuracy which a few years ago it was thought impossible to realise in the case of our own sun. Now that men of science have got the length of making the sun and stars write the story of their own constitution on photographic plates, who shall assign a limit to their future achievements?—*Daily News*.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1443. VOL. XXXIV.—DECEMBER 30, 1887.

HOW TO CONVERT GOLD RESIDUES INTO CHLORIDE OF GOLD.

PHOTOGRAPHERS who, like the correspondent whose letter appeared in our issue of the 16th inst., have only a small quantity of gold residue to deal with annually, would, in many instances, find it more satisfactory to treat it themselves rather than to send it to the refiner, particularly if they be afraid that they will not receive a fair return. The conversion of the gold in residues from old toning baths into fresh chloride to be used again, is really a very simple operation. It requires no special appliances nor exceptional skill, all that is necessary being neatness and care in the manipulations, for, it goes without saying, that if any of the metal be lost in the operations the proceeding may, in the result, prove anything but profitable.

Assuming that the waste has been saved and the gold thrown down in the ordinary manner with sulphate of iron, the residue will, at this stage, consist of metallic gold, chloride of silver, and extraneous matters, principally fibre of paper detached from the prints while toning. The first thing, therefore, is to separate the gold from the other matters. Here is the method of procedure.

Presuming that the whole of the metal has already been precipitated in the usual way, the residue is thrown on to a filter, placed in a funnel, and closely drained. It is now, filter and all, transferred into a good sized Florence flask. If any reduced gold is adherent to the sides of the vessel which contained the waste—and probably there will be a considerable quantity—a little aqua regia—one drachm of nitric acid to five drachms of hydrochloric—must be poured in and run round the sides. This will detach or dissolve the deposit, which must then be added to the contents of the flask. An ounce or two of aqua regia, according to the quantity of residue, are now poured into the flask; this must be done cautiously, as violent effervescence sometimes occurs, which without due care may lead to waste. When the ebullition has ceased the flask should be gently heated over a spirit lamp to nearly, or quite, the boiling point. The whole is now allowed to cool.

The flask is then nearly filled with water and well shaken, and afterwards the solid portion is allowed to subside. Next, the clear portion is carefully decanted on to a filter placed in a clean bottle. If any doubt exists as to whether the whole of the gold has been dissolved, fresh aqua regia should be added and the flask boiled again. If not, the flask must be again filled with water, and the whole of its contents emptied on to the filter and closely drained. A little fresh water may then be passed through the filter to ensure the entire removal of the gold. The filter and its contents may now be added to the silver residues, as what remains is principally chloride of silver.

The bottle now contains the whole of the gold, as a chloride in solution. But the solution is of an indefinite strength, and, moreover, it is too impure for photographic purposes, hence we must again precipitate the gold in the metallic state. A little of a freshly-prepared and filtered solution of protosulphate of iron, which has been rendered *strongly* acid with sulphuric acid, is now added so long as any further addition causes turbidity. But it is inadvisable to add more than is necessary, as it will have to be got rid of afterwards. After vigorous agitation, the precipitate is allowed to subside. This may take many hours, or a day or two, but sufficient time must be allowed for it to settle down compactly. The supernatant liquid is now decanted and the bottle filled up again with distilled water, agitated, and again allowed to subside. This must be repeated several times in order to remove all traces of iron.

After the last decantation the precipitate is transferred to a clean china saucer, or an evaporating dish, and dried by any convenient means—in the kitchen oven, for example. At this stage considerable care should be taken to avoid waste, as we are dealing with pure gold, which is worth four guineas an ounce. When the powder is dry it must be collected and carefully weighed, and then transferred to a small flask. It is next dissolved in aqua regia, diluted with twice its bulk of distilled water, no more being employed than is absolutely necessary to bring it into a state of solution. Heat may be used to assist the solution if time be an object. When the metal is all dissolved the solution is to be brought to a definite strength, or the salt may be crystallised. This, however, is quite unnecessary, as it entails extra trouble without yielding any corresponding advantage; therefore we advise its being retained in solution.

Supposing the dried metal weighed 200 grains it would be equivalent, roughly, to 400 grains of the chloride, and much more than this quantity of many samples now met with in commerce. If the bulk be made up to twelve and a half ounces with distilled water, each drachm of the solution will contain four grains of the chloride. Carbonate of soda is now added so long as it produces effervescence; this is done to neutralise any great excess of acid that may be present. But, as a neutral solution does not keep so well as an acid one, a few drops of hydrochloric acid, just sufficient to render it decidedly acid, must be added. In this condition the solution may be retained without the gold becoming precipitated.

When solutions of chloride of gold have to be kept for any great length of time, we prefer to keep them in a more concentrated form than the usual one grain to the drachm strength, as they are less liable to decomposition. The strength given above is the one we always adopt ourselves.

HEALTHY DARK ROOMS.

THE topic of healthy dark rooms is one that comparatively few years ago was perpetually cropping up at the various meetings, in our correspondence columns, or elsewhere. Yet, nowadays, how often do we hear of it? Practically speaking the question is a forgotten one; but that there is any valid reason for this neglect of a once burning topic we fail to see. The "fumes" of ether and alcohol are no longer present, but there are dark rooms still in existence, and without alteration, that colloid called into existence thirty years ago. The colloid has gone, the conditions as to ventilation remain; indeed, we are inclined to believe that from a sanitary point of view this is a distinct retrogression. We can, without need of proof, readily acquaint ourselves with the facts of the case as to the presence or absence of ether or acetic acid in the atmosphere, but the more deadly carbonic acid may be present unobserved, in actually poisonous quantities. When the unhealthfulness of the old dark room was assumed from the prevailing odour, it was in all probability an example of a correct conclusion from wrong premises; the converse now holds good—a wrong conclusion from correct premises. We are not aware of the existence of any account of distinct pathological experiments upon the inspiration of small quantities of ether or acetic acid, but the literature of pathology and sanitation abounds with facts as to the injurious consequence of the inhalation of small quantities of carbonic acid or of carbonic oxide, and we would, in the most urgent manner, draw the attention of all dark-room workers or their employers to the vital necessity for ventilation in those chambers, and to the fact that their healthfulness must not be assumed because of absence of chemical odour. We simply express the views of all authorities on the question when we assert that when air contains more than a certain proportion of carbonic acid its continued respiration is highly injurious to health; and we further say that we are of opinion that in far too many instances the overstepping of this limit is of daily occurrence. It is no part of our present plan to give working details of ventilating arrangements, nor of the construction of suitable dark rooms; we wish to give a few data from which these may be constructed by those who desire, and which will enable any one to ascertain with little trouble the condition of the air he is breathing.

The two factors of insalubrity are, of course, primarily the products of respiration, and, next, of the combustion of coal gas. For the nonce we only say of the sulphur compounds that accompany the latter that they add so much more noxious an element to the sum of injurious constituents of the atmosphere of an inhabited room that, unless the apartment be both lofty and spacious, it is almost suicidal to inhale it, and that such products should invariably be led away by chimney or flue.

Air containing only from $\cdot 09$ to $\cdot 1$ per cent. of carbonic acid is perceptibly impure, and Dr. Parkes has suggested that $\cdot 06$ per cent. be considered the standard, beyond which air must be called impure.

As to the extent to which air is altered by the respiration of one adult, it may be stated that every hour from sixteen to eighteen cubic feet are inhaled, from $\cdot 5$ to $\cdot 7$ cubic feet of carbonic acid gas being produced and exhaled in the time; he thus fouls a thousand feet of air, if free from carbonic acid to start with, really three thousand in practice—far more than the whole cubical contents of many dark rooms. In round numbers a foot of coal gas burnt per hour in an ordinary burner produces about the same ill effect as one man in regard to the

carbonic acid gas produced; most burners burn three or more feet. The above mentioned three thousand feet per hour is, further, the quantity that is usually assumed to be necessary for removal by ventilation every hour.

The space allowed in various public buildings in this country per head is as follows:—Barracks, six hundred; military hospitals, twelve hundred; civil ditto, eight to twelve hundred; Poor Law Board dormitories, three hundred; but in these various buildings special attention is given to ventilating arrangements. Thus the Army Sanitary Commissioners on Barrack Ventilation recommended a square inch of inlet area for every sixty cubic feet of room space, special shafts being arranged for both inlet and outlet of air.

As a rule, the door and window are the dark room ventilators, and both almost wholly kept closed in working hours. It is, however, estimated that an ordinary closed window is sufficiently loose to allow from five to eight cubic feet of air per minute to pass through, and a door to allow from fifteen to twenty. There is also a large amount of osmotic action through brick walls always taking place, and this assists ventilation. Thus Pettenkofer made an experiment in a room in his own house containing between two and three thousand cubic feet; and, when all openings in doors and windows were pasted up air-tight, about one-third that quantity of fresh air entered the room. This is the bright side of the matter, the beneficent process of nature operating to nullify man's carelessness. Still, it is evident that, in the case we are considering, special provision has to be made if health be not sacrificed.

After these statistics we may return to the first aspect of our subject, the need for some mode of readily ascertaining the character of the atmosphere of the dark room at any particular moment. We do not think it necessary to mention more than one, Dr. Angus Smith's, method, by lime-water. Assuming $\cdot 06$ as the limit of impurity, his method is to put half an ounce of lime-water into a bottle of ten and a half ounces capacity, and then to shake violently for a minute or two. There should be no precipitate: if a milkiness be seen, it is a proof that the atmosphere has passed the stage that divides healthfulness from harmfulness. To ensure the bottle being filled with the particular air under suspicion, it will not be enough to keep the bottle empty ready for use; it should be kept filled with water, and emptied immediately before use. The water will then be replaced by the air of the particular room where the emptying took place.

In this connexion, a patent based on an exceedingly ingenious idea has lately been taken out. We have on a former occasion described to our readers how phenol phthalcin, colourless of itself, is turned rose coloured by caustic alkalies, but is unchanged by their carbonates. The patentee utilises this property in his new apparatus. From a vessel containing a weak caustic soda solution of this salt there comes every one hundred seconds, through a siphon arrangement, a red drop on a prepared white thread about half a yard long, and trickles down it. Behind this thread is a scale, beginning with "pure air" (up to $\cdot 07$ per cent.) at the bottom, and ending with "extremely bad" ($\cdot 4$ to $\cdot 7$ per cent. and more). In pure air the drop continues red down to the bottom; but as it loses colour when it absorbs carbonic acid, the sooner the colour disappears the greater the proportion of carbonic acid present, the scale indicating that proportion. This seems something more than a toy, and should be a very valuable contrivance for dark-room purposes. But, whatever the method adopted, we believe we have sufficiently shown the grave importance of the subject,

and the necessity for ascertaining the extent and increasing the power of removal of impure atmosphere in the dark room of the photographer.

COLLODIO-CHLORIDE.

THERE is one other application of the soluble gelatine transfer paper to which we did not allude in our articles on *Home-Made Stripping Films*, partly because it scarcely came under that heading, and also because the process is so nearly forgotten, or has been so little used, that a separate article may well be devoted to it.

Collodio-chloride, though it has been before the public now for nearly a quarter of a century, has never apparently secured a very strong or lasting hold, in spite of the indubitable facts of the beauty of its results as well as their permanence, as well as the applicability of the emulsion to a variety of purposes. The reasons are perhaps, in one way, not far to seek: it was not sufficiently different from other printing methods in sensitiveness, character of result, and comparative permanency, to induce the general body of photographers to leave the already beaten track, though some few have during a number of years worked the process regularly, if not exclusively. The two best known of its steadfast upholders and exponents have been: in Great Britain, Mr. George Bruce, of Dunse, whose exhibited pictures for many years past have been entirely printed in collodio-chloride; and on the Continent, Dr. Liesegang, who has long endeavoured to popularise the process.

Perhaps the not least important reason why the process has remained in abeyance so long is to be found in the fact that no regular supply of the emulsion has been in the market, and photographers have therefore been compelled either to resort to the manufacture of the article on their own account or to use it by fits and starts as an intermittent supply offered; needless to say that the proverbial "conservatism" of professional photographers stood in the way of one, and the unsatisfactory influence upon regular business of the other, alternative. But as the manufacture of the emulsion is one of the simplest chemical operations, and there exists at the present time a large class of amateurs and others who are not averse to experiment on new or untried processes, especially if they offer any advantages over known methods, we have little doubt some of our readers may be inclined to try their hands with this one.

As its name suggests, collodio-chloride is an emulsion of chloride of silver in collodion; or, speaking more accurately, of citro-chloride, for chloride of silver alone will not give that necessary vigour and brilliancy of result. It is used for direct printing, or "printing-out," without development, and may be applied to paper, cardboard, ivory, opal, glass, or, indeed, any support to which collodion is applicable. The sensitive surfaces retain their good qualities for a very long time, certainly longer than ready sensitised albumen paper or gelatino-chloride; but the emulsion, though generally tolerably permanent, often exhibits a tendency to gelatinise or solidify from the action of the citric acid, and citrates upon the pyroxyline. There is, however, no difficulty in getting it to keep perfectly for a few weeks, and as the operation of making a quantity only occupies a few minutes, and it will keep almost indefinitely when spread, little reason exists for rejecting the process because the emulsion will not keep. If the same principle were applied to gelatino-bromide there would soon be a general return to the practice of wet collodion.

The great point in favour of collodio-chloride has been its close resemblance to albumenised paper in its behaviour, treatment, and results, with the added advantage that it can be utilised not only for paper work but upon glass or opal, or for any chance job that may crop up, even to making re-produced negatives, for which purpose it is peculiarly well suited. A few months ago a somewhat novel application of the process was brought before one of the London societies, namely, the production of transparencies by transferring the collodio-chloride image from paper to glass; and this connects it with our recent articles on stripping films, for it then becomes a veritable stripping film.

A weak point in the use of this emulsion upon glass, opal, or other impermeable support, is to be found in the composition of the preparation itself. In order to confer the property of rendering the force and vigour necessary in a "printing-out" process, it is absolutely essential that the collodion shall contain, in addition to its haloid, a due proportion of silver nitrate, or other soluble silver salt, as well as free acid—preferably citric—which serves the double purpose of keeping the emulsion and films and assisting to "organify" them. The presence of these substances, though entirely unobjectionable when paper is the support, because they are absorbed by it, gives rise to difficulties when the emulsion is applied to non-absorbent surfaces, since they are forced to crystallise in the collodion film, and possessing, together with the decomposition salts, more or less hygroscopic properties, are liable to cause irregularities on the resulting pictures if kept for any length of time after the surfaces are coated.

The difficulties are not insuperable, as the application of a preliminary coating or substratum of a partially absorbent character serves to considerably mitigate, if it does not entirely eradicate the evil, and at the same time acts beneficially in other ways, especially in causing the emulsion film to adhere to its support.

The following will be found a good formula for the emulsion:

Ether.....	2½ fluid ounces.
Alcohol (methylated)	2½ "
Pyroxyline.....	40 grains.
Chloride of calcium	12 to 15 "
Citric acid.....	15 "
Nitrate of silver	60 "

The pyroxyline need not be of any special "high temperature" kind, any good sample for wet collodion purposes and fairly soluble will answer well; avoid equally, both extremely powdery as well as "horny" contractile specimens.

Place the pyroxyline in a ten-ounce bottle, and pour upon it the ether; when thoroughly saturated add one ounce of alcohol, and shake well until dissolved. Now weigh out the silver nitrate, dissolve it by heat in a small glass flask in half a drachm of distilled water, and add one ounce of the alcohol, a little at a time, warming after each addition in order to prevent the precipitation of the silver. In another flask dissolve the chloride of calcium and citric acid in the remaining half ounce of alcohol.

To sensitise the emulsion take the hot alcoholic solution of silver and pour it, about a drachm at a time, into the thick collodion, and shake the latter thoroughly after each such addition. When the whole has been added the mixture will assume an opalescent, milky appearance, from the precipitation of a portion of the silver in extremely minute crystals. Allow it to stand in this state, with occasional shaking, for an hour or two, then add the chloride of calcium, citric acid, and remaining

alcohol, and shake vigorously for two or three minutes, and afterwards at occasional intervals. The emulsion will be ready for use, after filtration, in about an hour's time.

Those who are accustomed only to films of gelatino-bromide, or even of collodio-bromide, will be astonished at the extreme transparency of this emulsion when spread upon glass, notwithstanding the thickness of the layer of collodion. It is, in fact, not only perfectly transparent, but exhibits only a slight brownish opalescence when viewed by transmitted light, and gives little promise of possessing the power of darkening to any depth. This is due to the comparatively small quantity of silver converted into chloride, as well as to the natural transparency of the latter haloid; but the darkening power of the mixture is very great, and depends mainly upon the soluble organic silver compounds it contains. An emulsion less heavily charged with pyroxyline would be easier to use were it not that a considerable "body" is necessary to prevent the soluble matters from crystallising in the dried film.

This preparation may be used with almost any good sample of paper, though necessarily the finish of the surface will depend upon that of the paper, while the tone of the image will vary according to the nature of the sizing, an acid or gelatine sizing giving a redder colour than others. Upon glass or other neutral surface the colour before toning is a rich reddish purple, which in the gold toning bath rapidly changes to blue; consequently the bath should be of only moderate strength, any of the ordinary formulæ for albumen paper or the sulphocyanide bath answering well.

The gelatine-coated paper already described forms a most admirable support for collodio-chloride; and if properly prepared and in good condition is as easy to coat as glass itself. The paper having been first rendered perfectly flat is pinned to a light board, as described in a previous article, and coated in the same manner as glass; hung up to dry spontaneously it is ready for use in a few minutes, but it is as well to give it a final "airing" before a fire. In coating glass or opal it is absolutely necessary to dry by gentle heat, and if the plates are to be kept any length of time they should be preserved in a perfectly dry atmosphere with chloride of calcium or some similar desiccator, otherwise uneven markings appear on the surface from the attraction of moisture. These disappear to a great extent, or altogether, during the operation of toning and fixing, but are liable, if the plates have been long kept, to leave permanent markings behind. The danger is lessened by giving the glass or opal a preliminary coating of gelatine.

This difficulty of irregular markings, as well as the necessity for a special printing frame for use with glass plates in order to enable the progress of the printing to be watched, renders the making of transparencies direct upon glass an inconvenient operation. But if the emulsion be spread upon soluble gelatine paper it may be printed in the ordinary manner, and the picture afterwards transferred to glass as already described, thus enabling the operator to produce the most charming transparencies with scarcely more trouble than an albumen print.

Some little experience will, however, have to be gained in judging the density of the image, as it will appear far more intense while on paper than when transferred to glass, even when examined by looking through it. The printing must be carried to such a depth that, when examined as a positive by reflection, all the half tones are lost, and even the higher lights discoloured.

The paper is somewhat difficult to manage when wetted, owing to the difference in expansion of the paper and collodion film, which causes a strong tendency to curl up into a firm roll.

A little careful management will overcome this trouble, but we shall probably have a few words to say on this subject on another occasion.

It was stated at a meeting of the Physical Society by Mr. Hilger that there was now less need for liquid prisms, seeing that glass could be made with a mean index of about 1.8. He also stated that Dr. Perten had recently supplied him with a perfectly colourless Canadian balsam which would not tarnish the face of spar.

In the Report of the New York Pharmaceutical Association may be found such a crushing report upon the facts in relation to the purification of water by congelation, that the subject—which, from its interest to photographers and the process having often been recommended for obtaining a substitute for distilled water, has often been treated by us—may be almost considered exhausted, especially in the light of recent facts which have been brought before our readers. Notwithstanding the weight of such authorities as Professor Tyndall and the late Dr. W. A. Miller, who lean to the ordinary view, it is shown that ice and ice-water are very far from being necessarily pure. Thus, when urea in a little under one per cent. proportion, .83 exactly, was dissolved in water, the ice obtained from the solution contained just .5 per cent. When 1.5 per cent. glucose was dissolved, the ice held .96 per cent. Arsenic dissolved (by the aid of ammonia) to .178 per cent. gave .048 per cent. in the ice. The opinion of Professor Nichols, writing in 1882, is given, and it is equally condemnatory of the popular idea. Ice frozen from water containing salt dissolved will only, he says, contain "less" of the salts, while with organic matter the process of freezing may actually concentrate the impurities into the ice.

At no previous period in the history of photography has the art been so extensively employed in the production of Christmas and New-year's cards as this year. Silver printing, platinotype, collotype, carbon, Woodburytype, and gelatino-bromide, have all been pressed into service in obtaining the requisite supply, the latter two processes particularly lending themselves to the rapid production of large numbers at a rapid rate. Lithography has also been extensively utilised for reproductions from photographic originals. The subjects published have been varied, and include landscapes, copies of works of art, and portraits. Many of the latter, however, bear unmistakable evidence that they were not originally taken for the purpose to which they have since been applied. Evidently they are portraits, and were taken as such, and for no other purpose. It may, perhaps, be gratifying to some parents to see their pretty children's portraits exhibited in the shop windows for sale to strangers, to be afterwards sent with seasonable greetings to people of which they have no knowledge whatever. With other parents the case may be widely different.

CONSIDERABLE annoyance has, we are informed, been caused in some families by the free use which has been made of the portraits of some of its younger members without consent. This is too bad. In many instances the pictures are not photographs at all, but lithographs reproduced from them, in the closest imitation possible, with, perhaps, a background more or less appropriate to the season introduced. In most cases, however, the likeness is so well preserved as to be unmistakable. Indeed, it is the portraits which are the only interest, and if it were not for them the pictures would be commercially valueless, for the poses are invariably of the hackneyed studio type. Anyhow, the sitters, or their parents, have no remedy at present. If a new Copyright Act be passed, and it is framed on the same lines as all the projected ones have been, the system of publishing private portraits without the sitter's consent will receive its death-blow.

A CONFERENCE on the Merchandise Marks Act was held one day last week at the offices of the London Chamber of Commerce, at which there was a good attendance of delegates from the provincial chambers of commerce. It was unanimously agreed to form an association to promote the carrying out of the Act without damage to British commerce, and with this object in view a provisional Committee has been appointed.

LITTLE photography will be done by amateurs, we imagine, during the next two or three weeks, but there is no reason why it should not be practised at home and interesting pictures secured. Excellent figure studies and family groups, many of which could not be got together at any other season, can still be taken, and in an ordinary room, with rapid plates, when the light is fairly good, and when it is not, artificial may be substituted. The magnesium flash light affords a ready means of obtaining satisfactory negatives of such subjects when daylight fails. Some interesting, amusing, and even comic pictures might often be secured in the drawing-room during the festive season with this source of illumination. For example, a camera placed in an obscure corner of the room, with the lens focussed on an object under the mistletoe, and the light flashed at a certain time, would often secure a far more natural picture than could possibly be obtained by any other means. Fancy a group with the staid Mr. A. kneeling at the feet of the charming Miss B. "crying forfeits." What an amusing picture it would be. With magnesium powder burnt on guncotton, the light is so momentary that the individuals have not time to move, or to alter their expression, before the picture is secured. Of course, when this class of photography is indulged in, a certain amount of discretion must be used, otherwise what was intended as a harmless joke might turn out unpleasantly.

It would be interesting to know the number of opal glass "Christmas and New-year's cards" which have come to grief in transmission through the post during the last few days. If we may judge from our own experience as recipients, it has been large indeed. Many of these little tokens of remembrance have been sent through the post simply in the cardboard boxes in which they were purchased, with, perhaps, a thickness or two of brown paper wrapped round them, with a result that might well have been imagined. A fragile thing like a picture on opal glass, protected only by one or two thicknesses of cardboard, is not equal to the obliterating stamp of the Post Office when it is vigorously or hurriedly applied. It is a pity that the stationers who sell these pictures do not supply them in a rigid case for packing them in, which shall be equal to the exigences of the Post Office. Some do, we know.

ATTEMPTS will, no doubt, be made to photograph the interiors of many churches before the Christmas decorations, which have absorbed so much time to arrange, are removed. As a rule, photographs of these subjects are rarely satisfactory. This arises from the circumstance that the light is usually very bad at this time of the year, and from the non-actinic colour of the evergreens. Hence the negatives are usually very much under exposed; and, furthermore, there is frequently a large amount of halation, so that the result is disappointing generally. Much of this might be obviated if the negatives are given a very much longer exposure, and the plates are backed. In no case should an interior be attempted in which there are strong contrasts of light and shade, particularly when a prolonged exposure has to be given, without previously backing the plates—a point too often neglected by amateurs.

THE DEVELOPMENT OF TRANSPARENCIES.

THE development of a transparency, whether for lantern or decorative purposes, is an operation differing very materially from the production of a negative, notwithstanding that the chemical principle involved as well as the materials employed are identical. In the case of the negative, we are concerned in getting out the details in the least exposed or darkest parts of the picture, and in giving to the highest lights just that degree of density which confers "sparkle" without rendering them hard or "chalky," and these two main points being attended to, the half tones about which we frequently hear so much, may be pretty well left to take care of themselves, while a slight veiling of the shadows or degradation of the absolute clearness of the film is of little moment, or even considered by some operators an improvement to the printing qualities of the negative. What we have to do in fact is, with a given exposure to get as much out of the plate in detail and brilliancy as we can.

In the development of a transparency, we have equally thrust upon

us the necessity for getting out the minutest details in the least exposed portions of the picture—in this case the high lights—while we must have sufficient force in the shadows, and this without losing transparency, or what is tantamount to it, burying their details and so causing heaviness instead of brilliancy. With a good negative to work from it is perhaps not very difficult to secure these two extremes, and in that case here, also, the half tones may be trusted to look after themselves; but when the negative is not all that is desirable without "dodging"—if it be a trifle hard, or, on the other hand, inclined to be flat—the chances are that the same qualities will mark the transparency unless either by careful arrangement or happy accident the exposure and development are so suited to one another as to effect the necessary modification.

It is, in fact, a more difficult operation to produce a perfect transparency—if such a thing exist—so far as accuracy of gradation is concerned, unless the negative be equally "perfect," than to make a negative from nature, the latitude in development being far more limited in the former than in the latter case.

But where the transparency is concerned, we have to consider in addition to the proper range of "tones" the purity of the high lights, or, in other words, the absolute clearness of the unexposed portions of the film. Time was when a perfectly white sky in a paper photograph was considered a good quality, but that was in the days when absolute whiteness was perhaps one shade better than the murky, uneven tints that too often did duty for the sky in landscapes. Next, white skies came to be preached down as inartistic, and an evenly but slightly tinted blank was considered the proper thing until the practice of printing in real skies became general, or of securing sky and landscape at the same time became at all possible.

But, so far as I am aware, a tinted sky or veiled high lights have never been recognised as either desirable or permissible in a transparency with any claims to quality, whether for merely ornamental, for stereoscopic, or for lantern purposes, least of all, if there be any question of degree, for the last. So that in the development of transparencies we find ourselves additionally handicapped by having to preserve absolutely clear films while combining delicacy of gradation with depth and brilliancy of image.

The old system of development consisted in giving the shortest possible exposure—i.e., the shortest exposure that would penetrate the high lights of the negative—and developing rapidly with a strong but adequately restrained solution, so as to bring up the picture quickly to full strength at one operation. This plan certainly favoured "clear glass" high lights, and under favourable conditions also gave pluck and contrast in combination with proper gradation. But this was in the days when negatives were made with collodion, and themselves possessed more of the combination of those three qualities than their modern successors do; they, in a word, had more "sparkle" and suited such treatment if of good average quality, but were pronounced unsuitable for transparency work if the treatment did not agree with them.

The modern gelatine negative differs very considerably in character from those of the old collodion days, whether wet or dry; I am not going to imply that it is inferior, nor do I say it is the reverse, but simply it is different. I can well understand old wet-plate men looking back to their negatives of former days with feelings of regret, for certainly no more perfect type of negative to look at and for rough, straight-away printing has yet been seen—certainly not from gelatine plates. But after all the negative is only a means to an end, and if a less prepossessing *looking* plate with careful treatment will give a better result, we are bound to recognise its advantages. Print a copperplate and a wood block with the same amount of care, and the wood block would "have the pull;" but not so if the copperplate were properly worked.

The main difference in modern negatives is the presence of far more minute detail—I am speaking of the now recognised type of a properly exposed gelatine plate—with less of the contrast—fewer notes in the gamut, as someone described it—that went to make the so-called "sparkle" of the wet plate. And so it happens that to produce the finest results in printing a different course must be adopted to that which served in years gone by. It was long ere this was recognised, hence, perhaps, the outcry there was some years ago on the subject of the "want of sparkle" in gelatine plates. But since more attention

has been given to printing matters, I venture to say that quite as good work has been turned out from gelatine plates as from collodion, speaking merely of the finished print from a technical point of view, while as regards the class of subjects possible with gelatine and their general rendering there can be no two opinions.

If the different character of modern negatives requires modified treatment when paper prints are in question, surely some variation in manipulation may be ventured on when glass transparencies have to be made. And if we examine ever so slightly into the details of the production of the latter, there appears all the more reason for such a course. Whatever class of plates may be employed, collodion or gelatine, their superior sensitiveness to albumenised paper increases their tendency to softness rather than "sparkle;" consequently, if paper prints from gelatine negatives are, with ordinary treatment, blamed for their want of force and general robustness, transparencies under similar conditions must suffer the more.

No one, I imagine, who has tried transparency making upon gelatine plates—even the slow and specially prepared ones—can have failed to recognise the fact that to produce results which will at all compare in quality with paper prints from the same negatives, the utmost care must be bestowed not only upon the exposure but upon the development as well. By quality, I mean here simply quality of gradation, from purity of high lights to depth and transparency of shadows, and not in any sense comparison of tone or colour. The old system of giving a short exposure and quick development gives unsatisfactory gradation and bad colour, and as the exposure is lengthened, so is the tendency to veil and general flatness increased, however the development may be modified. Variations in development, indeed, seem to end chiefly in keeping away absolute *fog*, but so far as materially modifying the gradation of the picture is concerned, they appear beyond a certain point to be useless.

The best results I have been able to obtain upon gelatine plates, after "ringing the changes" in every possible direction, have been produced by first of all paying careful attention to the exposure. That is a point upon which very little can be said that will be of any use as a guide beyond that it must be sufficient without going to excess. Perhaps it is safer to err slightly in the direction of under than over exposure. The next point is to use a modified developer in which the main difference lies in greatly reducing the proportion of pyro—say, to one grain or even half a grain to the ounce, according to the character of the plate—while the quantities of bromide and ammonia remain at about the normal, the bromide being always present in sufficient force to hold the development well in hand without exercising too great a check.

With such a solution, and supposing the plate not to have been over exposed, a thin, clean image, full of detail, but utterly devoid of density, comes up easily and gradually, and must be stopped the instant the amount of detail required is visible by reflected light. With most plates this image will be so delicate as to be nearly, if not quite, invisible on looking through the plate, while examined by reflected light it presents little or no contrast in strength between what should be the deep shadows and the more delicate gradations of the lights. If now the plate be washed and treated with a fresh solution, containing at least three grains of pyro to the ounce, the normal quantity of alkali usually employed with that "make of plate, and double or treble the ordinary dose of bromide, the effect will be magical. The image rapidly gains in force, until what at first looked flat and hopeless develops into a well-modelled and vigorous picture, with as much clearness in the lights as can be obtained from a film of gelatine.

The treatment of collodion emulsion plates is very similar, indeed, it was the behaviour of those plates under that treatment that induced me to apply it to gelatine. In the case of collodion, however, it is of more importance to reduce the ammonia than the pyro in the developer, and the bromide may be altogether omitted. The development of collodion and gelatine plates respectively differs in this respect, that with the former the proportion of alkali used in the early stage of development has more effect in ruling density than pyro, with the latter the reverse is the case. Hence, in order to obtain the thinnest possible image in all its detail, I reduce the quantity of alkali. For an emulsion giving ordinary density with tolerable ease, I use, say, two grains of pyro, two grains of carbonate of ammonia, and if any at all,

not more than two or three minims of a ten-grain solution of bromide of potassium to each ounce of solution. This will bring out in the course of thirty seconds, if the exposure have been sufficient, a fully detailed image so extremely delicate as to be quite invisible in the light usually employed for gelatine plates, and difficult to watch even in a full yellow light when the eye is accustomed to gelatine.

I may say here that the matter of exposure is of less importance in the case of collodion, or rather, that so long as sufficient time is given there need not be much fear of over doing it, as the development may be stopped instantly when the proper point is reached. Here, again, vigour is obtained by the application of a stronger but energetically restrained solution, containing, say, three grains of pyro, fifteen to twenty of carbonate of ammonia, and from half a drachm to a drachm of a ten-grain bromide solution to the ounce. Under this solution the feeble, scarcely visible image rapidly gains strength, and its action may be continued until the requisite density is obtained without the slightest chance of any fresh detail, or, if the emulsion be all right, any veil appearing.

But instead of intensifying with alkali I greatly prefer silver, which not only gives strength but also *tone*, and that in a manner that alkali seldom or never does. It is, moreover, as rapid, as clean, and in every way as convenient as alkaline pyro, if the solutions are at hand, and possesses none of the terrors it seems to do for gelatine workers. Make two solutions, the first consisting of—

Pyro	6 grains.
Glacial acetic acid	1 drachm.
Water	4 ounces.

Flood the plate with a small quantity of this (after first washing well) and return it to the developing glass and add, say, one drop to each drachm of a fifteen-grain solution of nitrate of silver, slightly acidified with nitric acid. Remember that the smaller the quantity of silver added the warmer and finer will be the colour, but the action will be slower. With the quantity named no difficulty will be felt in intensifying and toning the thinnest image.

I. Y. E. COTESWORTH.

HISTORICAL NOTES ON THE OPTICAL LANTERN.*

AMONG the questions other than historical suggested for discussion by this meeting, is, Supposing a first-class Italian painter were to execute a fine work of art upon a lantern slide, is the average optical system of the present lanterns good enough to do full justice to his work upon the screen? Probably as the lantern is now becoming a popular household instrument, a limited portion of its users would not object to incur large expenses to obtain high-class artistic slides of ideal or real subjects. Could not such ideal subjects be executed in monochrome on a large scale by skilled artists, then be reduced as lantern slides by photography, and, lastly, be coloured by artists? I should like to ask whether the three-wick lamps of commercial lanterns are always so mounted as to be easily centred in relation to the optical axis of the lenses? also what objection there is to invariably fixing a small lens near the three-wick lamp, to nearly double the amount of light the lamp will cast upon the ordinary large condenser? Can those who have invented apparatus to make oxygen continuously near the lantern, and no faster than the lantern uses it up, exhibit the said apparatus at work before this Association? Cannot oxygen for the purpose be made as required, in the wet way, without heat, as suggested years ago by Dr. Emerson Reynolds? In many private homes, the various disadvantages connected with making and storing oxygen in bags or cylinders will operate against the use of oxygen with the lantern until some simple process is devised to give off the gas just as fast as the burners use it up, so that no storage is necessary.

W. H. HARRISON.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION EXHIBITION.

THE fifth annual exhibition of photographs by the members of the above Association was opened on Saturday, the 24th December, and remains open to the public for a fortnight, closing on 7th January.

The Executive of the Association has made a fresh departure this year. Instead of, as in previous years, holding the exhibition in the galleries of the Fine Art Institute, in Sauchiehall-street, where the meetings of the late Photographic Convention were held, they have seen

* Concluded in abstract from page 811.

proper to utilise their own premises at 180, West Regent-street, and so far as the accommodation is concerned it is ample for present requirements, but should the Association go on progressing in future years as in the past, much larger premises will again be required.

The growth of the Association has been most marked during the five years of its existence. Commencing with a membership roll of about thirty, it has steadily progressed from year to year until now its members number 168, and to keep pace with this large and continuous addition the Council has had to provide additional accommodation for the members, the original rooms being crowded to excess at many of the Association's meetings. To overcome this they have lately made considerable additions to their rooms, and now they possess a fine suite of three large apartments at the above address.

Entering the premises situated on the top storey, the visitor finds on the left a very commodious dark room containing lockers, half a dozen developing sinks, with every other facility the most fastidious taste could desire. Passing into the public rooms we enter the council room, where the Tuesday evening's informal meetings are held, and where all the latest gossip of the hour is freely discussed over the friendly pipe of peace. These Tuesday evening meetings have become quite a feature, and are largely attended. To the right of the council room we enter the large room of the Association, and which has quite recently been added. This is an excellent room, and is capable of seating fully 200, being well lighted by day and night. Much taste has been exercised in the way of adapting it for the present exhibition, the wall space being coloured with a suitable tint, so as to show off the various pictures to the best advantage. A very efficient mode of hanging the pictures has been adopted by running a beading round the entire room, and from which hooks are suspended carrying the various frames, thereby dispensing with nails. In striking contrast with past years, the hanging of the pictures on the present occasion show to great advantage. Profiting by the experience of the past the Hanging Committee were wise enough to allow themselves ample time for their work, which has been done with much care, and free from all haste and scurry, no picture being above six feet or below two feet from the floor.

Comparing the present exhibition with that of 1886, we find a falling off in the number of pictures. Last year, we believe, there were about 160 frames, this year the number does not exceed 130, and on glancing over the list of exhibitors one is struck with the number of many local amateurs who are not represented. We miss Mr. Goodwin, the enterprising Secretary, who by the way was prevented from doing much work last summer through illness, but who, we are pleased to say is now nearly himself again. Then, again, Mr. Wm. Lang, F.C.S., is not represented, but doubtless his hands are full to overflowing with the arduous task he has to perform of taking charge of the Photographic Section of the International Exhibition, and which, by the way, is going to be a big success. Then, again, the following are conspicuous by their absence:—Miss Gibson, Miss Thom, Mrs. Ramsay, the Misses Coulson (five) who in past years contributed largely, W. H. Turner, Wilfred Smith, W. F. Finlayson, James Elder, P. Falconer, R. Cutting, John Parker, R. Dalglis, Alex. McDonald, W. Ovenstone, A. J. W. Reid, and others.

On the other hand, we notice many new aspirants for honour, among whom may be noticed D. R. Clark, W. Renison, John Morrison, jun., W. McLaren, R. Knox, Leyson T. Merry, J. R. Berger, W. R. Buchanan, D. Glen, D. S. Macnair, and Dr. McCorkindale. Why the number of exhibitors this year should be fewer than last, seeing the membership is much larger, is a question we have heard frequently mentioned and discussed. The late summer, so far as weather was concerned, was all that could be desired, and without doubt much excellent work was done by many who are not represented. We believe the solution of the question lies in the fact that most of the members named are keeping their pictures back for the International Exhibition.

The Executive have this year again had the prizes awarded by two independent judges. The gentlemen who have this year performed these arduous duties are Mr. Wm. Young, artist, and Mr. James Paton, photographer, Greenock, and they came to their various decisions without any differences of opinion worth speaking about.

The following is the list of their awards:—

COMPETITIVE PICTURES.

Class 1 (Landscapes).—First prize, silver medal, Hugh Reid; second, bronze, John Dore; third, bronze, John Rennie.

Section B (Small Landscapes).—First prize, silver medal, Arch. Watson; second, bronze, R. B. M. Stewart; third, bronze, John O. Hutcheson.

Class 2 (Figure Studies).—First prize, silver medal, Arch. Watson; second, bronze, David R. Clark.

Class 3 (Instantaneous).—First prize, silver medal, J. C. Oliver; second, bronze, Arch. Watson.

Class 4 (Portraits).—First prize, silver medal, W. S. Anderson; second, bronze, Hugh Buchanan.

Class 5 (Groups).—First prize, silver medal, J. C. Oliver; second, bronze, David Irving, jun.

Class 6 (Animals).—First prize, silver medal, James Fleming; second, bronze, Leyson T. Merry.

Class 7 (Still Life and Interiors).—First prize, silver medal, D. McCorkindale; second, bronze, John Morrison, jun.

Class 8 (Enlargements).—First prize (a protest has been lodged against this award on account of the infringement of the rules); second, bronze medal, J. C. Oliver; third, bronze, D. S. Macnair. Should this protest be sustained, Mr. Oliver will take first and Mr. Macnair second prize.

Class 9 (Transparencies).—First prize, silver medal, W. S. Anderson; second, bronze, James Fleming.

Class 10 (Developed Prints).—First prize, silver medal, Arch. Watson; second, bronze, J. C. Oliver.

With regard to the protest lodged against the judges' award in the enlargement class, it appears that the rule against any touching of the finished pictures is alleged to have been infringed by Mr. D. R. Clark, the allegation being that in one picture at least the print shows unmistakable signs of being worked up. The matter will be brought before the Council at an early date, and their decision will be duly notified in our next.

Speaking generally, the exhibition, as a whole, is not superior to past years. Without doubt the landscape classes are most excellent, and the judges only arrived at their decision after much thought and trouble, so equal are many of the exhibits. Mr. Reid, who has this year been successful in the large landscapes, deserves great praise for the excellence of his pictures. Technically they are perfect, and his success is very popular with the members of the Association. Mr. Watson takes no less than five medals. In the small landscape class, his picture of *Spring-time* is just one of those delightful pictures the eye never tires of looking at.

In the large landscape class Mr. W. S. Anderson is well represented, and although the judges have for some reason or other not seen fit to award him a medal, in our estimation there is no better landscape in the room than his *On the Braes of Loch Lomond*.

Mr. W. Ilume also contributes a charming set of three little bits, which are well worthy of notice.

The figure studies is a poor class taken as a whole, and the judges had little difficulty here. In the portrait class Mr. W. S. Anderson takes first prize and Mr. Buchanan second.

We regret to notice that this year the element of retouching has entered largely into the exhibits, and in very many cases it has been carried to excess; as an exception, however, to these remarks, Mr. Oliver's pictures stand alone.

One of the largest exhibitors over the various classes is Mr. D. R. Clark, but his pictures lack softness, and have the appearance of being much under exposed, and in several instances are faulty from false lighting.

In the still life class the judges have seen fit to go past Mr. Sheriff's charming *Studies of Flowers*, much to the surprise of many. In our estimation this gentleman's exhibit is far and away ahead of anything in the class.

In the transparency class Mr. W. S. Anderson takes first prize; as a whole, however, the exhibits are not of much merit, none of the collodion transparencies being toned.

Mr. Oliver is to be congratulated on securing the medal for the most artistic picture in the room; his *Waiting for a Bite* is a gem, and the judges had an easy task in coming to this decision.

In the non-competitive class Mr. R. B. M. Stewart shows two exceedingly fine enlargements of the yacht *Thistle*, taken from negatives obtained on board the *Vanguard* during the Convention trip at Largs Regatta.

Perhaps the best class in the exhibition is the enlargements. Among so many examples of excellence it is difficult to select those for special mention after the awards of the judges, but we cannot refrain from again speaking of the excellence of Mr. W. S. Anderson's set of three. A finer bit of work than his centre picture, *An Autumn Haze*, we have never witnessed, still somehow the judges think otherwise. In this class Mr. J. Ure Primrose comes out strong also, his portrait enlargement of *Old Mr. McFurlane*, the negative of which (half-plate) was taken inside an old hut at Kilcreggan, is well worthy of notice. During the continuance of the exhibition the Council has arranged for several popular meetings. The optical lantern will be brought into requisition, and the transparencies will be furnished by different members of the Association.

THE FADING OF SILVER PRINTS.

If we assume prints upon albumenised paper to be liable to fade from at least three different causes, and if photographers in numerous instances are known to be more or less careless in relation to one or two of the three causes, the fading of so large a proportion of such prints is explained.

To one of the probable causes of fading I think that too little attention has been given, namely, to the occasional imperfect coagulation of the albumen by the various solutions, and to the presence of this or some other organic matter in the print liable to relatively rapid decomposition, liberating at the same time sulphurous gases to attack the silver. That the organic matter of a finished print is not always in good condition is an inference to be drawn from a statement made by Mr. J. Hubert a few days ago at a photographic meeting, to the effect that when damp finished prints are allowed to lie upon each other in a pile for too long a time, they give off a bad smell. He also stated that he had found that if they were left long enough under such conditions the image would become spotted.

Supposing those prints to have been dried in the ordinary way, they would have been relatively, but not absolutely, dry; in fact, while exposed to the atmosphere at all they could never be perfectly dry, hence it is reasonable to assume that after they were quickly dried the same changes would have taken place in a long time which, while they were wet, took place in a short time. Here, then, we have a cause of decay not necessarily due to imperfect toning, fixing, or washing.

The evil smelling organic matter must have been either albumen or something else. My reason for believing it to be imperfectly coagulated albumen is that some time ago I had occasion to thoroughly coagulate films of plain albumen upon paper, and did it by means of that powerful agent for the purpose—phenol, better known as carbolic acid. When this was properly done, the paper, after drying, curled up with more vigour than I have ever yet seen done by a photographic print: its surface had become waterproof, and could not be evenly wetted; a drop or two of water might stick on the film here and there. Thus a properly coagulated film presents characteristics not seen in photographic printing, and we may safely conclude that such films if allowed to rest upon each other a reasonably long time in a damp state would not acquire a bad smell, or exhibit a tendency to generate micro-organisms.

My suggestion, therefore, is, that a little carbolic acid should be put in the final washing water of albumenised prints; that they should next have all superfluous moisture removed by blotting paper, then be soaked for at least ten minutes in a solution of methylated spirit, to each quart of which two drachms of crystallised carbolic acid have been added. After removal from this bath they might be allowed to dry. Blotting paper free from hypo is on sale in the market; the methylated spirit may be of the commonest, but free from resin.

For many years I have not produced a print upon albumenised paper, believing that the sooner the process dies out the better; hence I have not tried the preceding remedy for one probable cause of fading. Any one can easily try comparative experiments in the matter who is in the habit of producing photographs by the process.

A little phenol will go a long way in arresting decay. In chemical nature it is so much like creasote, that in early times chemists were in doubt whether they were not the same substance in different forms. Professor Allen Miller says:—"Kreasote produces the immediate coagulation of albumen. It is the most powerful antiseptic known. Meat that has been plunged into a solution containing one per cent. of kreasote gradually becomes dry and hard on exposure to the air, and acquires the flavour of smoked meat, but does not become putrid. . . . Much of the kreasote of commerce is simply carbolic acid." For the purpose I have suggested phenol is as good as creasote, and cheaper. Mr. William Crookes made a careful report upon the powerful antiseptic properties of phenol, when he tried it under the sanction of the Cattle Plague Commission. Its poisonous nature should, however, not be forgotten by its users.

An advantage from giving prints a final soaking in methylated spirits and phenol will be, that they will afterwards dry more quickly. Another advantage is, that the aqueous washings having dissolved out everything soluble in water, the final treatment will dissolve out anything which may be soluble in spirit.

A second cause of the fading of ordinary albumenised prints is, as Mr. W. K. Burton recently pointed out so clearly, an insufficient deposit of gold; the less gold a sample of paper requires to tone it the worse is that paper for producing permanent prints, and it should be rejected. Mr. Burton tested his views experimentally, by proving that the more complete the toning the better did the prints resist the action of bichloride of mercury, but it may not be generally known that the editor of this periodical tried analogous experiments twenty-

one years ago. He cut a print into four parts; one he over toned in alkaline gold, the second he partially toned to a purplish sepia tint, the third was simply fixed, the fourth was toned to a proper tint, and kept as a standard of comparison. The first three were suspended in a box two feet and a half square, in which a minute gas jet of about the size of a pea was constantly burning; the only ventilation was through a round hole one inch and a half in diameter. He reported: "The untoned print was almost entirely destroyed in three days. The partially toned one resisted tolerably well for five days, as far as the half tones and shadows were concerned, but the high lights or whites had already become yellow. Two days more rendered it a ghastly spectacle of the 'sere and yellow leaf' both in the half tones and shadows. The over-toned print has yet (after eight days) shown no symptoms of decay, except in the high lights, which have become yellowish."

Come we now, in the third place, to the cause of fading with which it is most difficult to deal, namely, the traces of organic salts of silver left in the film, some compound probably of albumen and the metal. This usually causes the slow destruction of the print, years being necessary for the operation, and the decay can then be largely arrested by treatment with bichloride of mercury, which, be it noted, is a powerful antiseptic and coagulator of albumen. Had the print been washed in phenol at the outset, as already suggested, is it not probable that the subsequent treatment with bichloride of mercury would have been unnecessary?

Is it absolutely impossible to escape the presence in a finished print of this insidious organic salt of silver? Mr. Carey Lea claims to have done something of the kind, but his conclusions were formed upon but few experiments; other samples of paper or albumen might not have given the same results. He sensitised his paper upon a forty-grain acidulated bath, then fumed it for five minutes with ammonia, printed it, and toned and fixed by the old, much-condemned process of one operation. He says:—"Two ounces of hyposulphite of soda were dissolved in eight ounces of hot water, and chloride of gold corresponding to one grain metallic gold was added while hot. The bath was used two or three hours after mixing. This bath toned to a rich purple-black." On testing the prints with sulphide of ammonium they were found to contain no silver in the whites. Sulphide of ammonium will yellow a film of plain albumen, but that yellowness disappears on drying, hence, in applying this test, the prints must afterwards be allowed to dry before the result can be accurately known.

If acid chloride of gold be added to hyposulphite of soda, the result is to liberate a little tetrathionate of soda, which is liable to set up sulphur toning; hence the chloride of gold must be neutralised with chalk before it is added to the hypo.

The worst of the old-fashioned toning and fixing bath was that it would go on toning with sulphur after all its gold had disappeared, thus subjecting economical or careless photographers to undue temptation. When properly utilised, and the prints soaked a little in clean plain solution of hyposulphite of soda afterwards, the results were good and the tones rich.

Experience with gelatino-bromide plates proves that when they appear to the eye to be fixed they are in reality not fixed, and must be left in the solution as long again. Doubtless something of the same kind occurs with chloride of silver in albumen, but is there not so perceptible; if the prints have had their full time in clean hypo of the proper strength, they are likely to be more permanent than would otherwise be the case. Probably much fading of prints is due to too short a time in the fixing bath, or to that bath being too weak in consequence of the operator having mixed it by guess instead of by weight and measure. Photographic results are influenced by such apparently slight causes that it is not wise to do anything by guess where it can be avoided.

Another possible cause of fading may be left in the film by insufficient fixing, that cause being an insoluble double salt of silver. Hyposulphite of silver is so unstable as to be destroyed almost as quickly as it is formed; but two double salts of silver may be formed during fixing, the one soluble and the other insoluble in water. The latter is freely soluble in ammonia, also in sufficient excess of hyposulphite of soda, when proper time is allowed. The final fixing bath should always be made alkaline with ammonia. W. H. HARRISON.

PHOTOGRAPHY IN 1887.*

CAREY LEA has hitherto been one of the most enthusiastic supporters of the physical theory, but it is extremely interesting to find that the investigator who has shattered the chief argument in favour of this theory is—Carey Lea! We have here an excellent illustration of the fact that a

* Concluded from page 812.

truly scientific man has little respect for even his own pet theories if they are found to be inconsistent with the facts. Carey Lea observed that if a film of silver iodide obtained by treatment with a solution of iodine is exposed in the camera and is developed immediately, an image is obtained; but if the exposed plate is put on one side and not developed until some time afterwards, no image is obtained, the latent or developable image having gradually disappeared. He now finds, however, that silver iodide has the property of absorbing and retaining a certain quantity of free iodine. In the experiment described the silver iodide retains some of the free iodine contained in the solution by means of which it has been prepared, and when an exposed plate is allowed to remain undeveloped, this small quantity of free iodine gradually combines with the subiodide which has been formed, and reconverts it into the ordinary iodide. The fading of the latent image is, therefore, the result of a chemical and not a physical change.

Carey Lea finds that by the action of certain reducing agents he can obtain from silver chloride, bromide, and iodide by purely chemical means and without the action of light, coloured products identical in composition and properties with the coloured products obtained by the action of light on the same salts, and therefore, in all probability, of the same chemical nature. These products vary in composition according to their mode of formation, but always contain less bromine, chlorine, or iodine, than the ordinary salts, whilst they are much more stable than the so-called subsalts. Carey Lea regards them as compounds of the subsalts with a large excess of the unaltered ordinary salt, and proposes to call them photo-salts, that is, photochloride, photobromide, and photoiodide.

He also finds that certain reducing agents, and notably sodium hyposulphite, will produce on a sensitive film an invisible effect which, like the effect produced by light, can be developed into a visible image. The latent images produced by light and by the reducing agents behave in precisely the same manner towards reagents such as nitric acid and the haloid salts of potassium. What destroys the one, destroys the other. What does not affect the one, does not affect the other. It is fair to conclude, therefore, that the latent image is of the same nature in both cases. Moreover, just as light can produce both direct and reversed images, so the reducing agents can produce direct and reversed images, and the conditions under which reversal takes place are similar in both cases. Light can, in fact, reverse the image produced by the reducing agents, and *vice versa*. In both cases, continued action results in the formation of visible photo-salts. The formation of an invisible or latent image is the initial stage of a reaction which, when prolonged, produces a visible effect, and it follows that the invisible and visible images differ in degree only, and not in kind, as Abney has always contended.

An invisible but developable image can be formed on film of silver tartrate, silver oxalate, and other silver salts. If before development the film is treated with hydrochloric or hydrobromic acid, so that the whole of the silver salt is converted into chloride or bromide, the latent image is not destroyed, but can still be developed; the resulting image is even more intense than that obtained when the salt is not converted into chloride or bromide. It follows that the alteration in composition or constitution which renders the silver salt amenable to the action of the developer can be transferred from one salt to another, and Carey Lea regards this as evidence of the general existence of subsalts of silver corresponding with most if not all the ordinary salts.

It should be pointed out that the existence of definite subsalts of silver is still a disputed point amongst chemists. We may, however, take Carey Lea's results as proving that the production of the latent image by the action of light is an instance of a chemical change produced by a physical agent, and that the material of which the latent image is composed is chemically different from the salt which has not been affected by light, but the exact constitution of this material has still to be determined.

In this year of Jubilee it is not altogether inappropriate to attempt some sort of general estimate of the present position of photography, especially as the art may be said to have begun with Her Majesty's reign. To the majority of people photography is simply a useful process for obtaining "likenesses" and "views." Of its artistic capabilities, and of the extent to which its results, direct or indirect, permeate our everyday life, they have not a suspicion. It is even not too much to say that a large proportion of photographers—of amateurs, at any rate—have little idea of the multitudinous uses to which the art is put. There are few things more remarkable in the history of applied science than the rapid development of photographic processes during the past thirty years, and it is not extravagant to claim that this is an age of photography as much as it is an age of steel or of electricity.

Even if it were merely a method for producing likenesses we should find it very difficult to dispense with it now, but its utility is far more wide-spread than this. The physicist and meteorologist use it constantly as a means of accurately and anatomically recording observations; the astronomer finds that he can photograph stars and nebulae otherwise outside human ken; the microscopist, instead of spending hours upon hours in delineating a complex structure, attaches his microscope to a camera and makes the structure produce its own image; the anatomist and physiologist employs the drop shutter and the sensitive plate as the only available method of analysing the rapid movements of man and other animals. We have already evidence that the day is not far distant when cameras attached to balloons will not only give us an accurate plan of a vast stretch of country, but may enable contending armies to provide

themselves with maps of the country through which they are marching, and also to ascertain the exact distribution of the enemy's forces. To-day no explorer's outfit is complete if it does not include a camera, and the records of distant lands obtained in this way far out-value any amount of written description and pencil sketches. At the last exhibition at Pall Mall there was no exhibit more remarkable than Mr. J. W. Lindt's series of photographs in New Guinea, a country hitherto very little explored. Take only two instances. We are accustomed to think of lake dwellings as belonging altogether to prehistoric times; but here was a lake dwelling of to-day, stretching with its inhabitants over the broad waters of a lagoon. Not very far away was a picture of a hut-like human dwelling, perched like a gigantic nest in the branches of a tree. Now, if a traveller had come home and simply described these things, would it not have been insinuated that he was making an unscientific use of his imagination? The evidence of photographs is upon another footing.

It is, however, in the form of photo-mechanical printing processes that the utility of photography is most strongly marked. Photogravure, especially when used in conjunction with orthochromatic processes, is rapidly distancing its older rivals, engraving and etching, as a method for the accurate reproduction of drawings and paintings of all kinds. Collotype, when used in the hand-press, yields results little if at all inferior in point of delicacy; when used with the steam press, produces excellent results with such great rapidity and at such a low rate that it forms an economical process for the illustration of catalogues and for similar purposes. To photo-zincography we are mainly indebted for the accuracy and cheapness of our smaller scale Ordnance maps. Photo-zinc blocks, both for line and half-tone subjects, are very largely employed indeed. With the former excellent results are obtained, even in the reproduction of drawings full of complicated detail; but a great deal has still to be done before half-tone blocks can be regarded as equally satisfactory. In this, and indeed in almost all photo-mechanical printing processes, we, in this country, are still behind our foreign competitors. All the processes alluded to, and likewise photo-lithography and Woodburytype, are very largely used for the illustration of books of all kinds, the block processes being generally adopted for ordinary work, since the illustrations can be printed along with the type. The great increase of illustrated periodicals may in fact be attributed, in a great measure, to the development of these processes. Both line and half-tone blocks are used, for instance, with great success by such publications as the *English Illustrated Magazine*, *Harper's Monthly*, and the *Century Magazine*, to say nothing of unknown periodicals like *Punch*.

Photographic prints are largely used in the form of transfers in the decorative arts, and notable for the decoration of pottery, and photo-etching processes are used for such purposes as the engraving of the rollers used for calico printing, &c. Another application of photography, which at first sight might seem of minor importance, but is really of very great practical value, is the reproduction of engineer's drawings and plans by the cyanotype or Prussian blue process. And lastly, this summary would be incomplete if no reference were made to the extensive employment of photography all over the civilised world for the detection of criminals and the prevention of crime.

One of the great advantages of many of these processes is the cheapness of the results and the rapidity with which they can be produced, two very strong recommendations to popular favour in these times of high pressure.

So far photography has been treated entirely as a method of reproduction, a register of facts, and from this point of view its value is indisputable. How far can it claim to be regarded as a method of creation, or, in other words, as a fine art? This is a question of an entirely different character, and one on which I speak with much diffidence. In fact, I should not venture to deal with it at all were it not that I am able to refer to photographic pictures which are, or ought to be, well known, and which may safely be left to speak for themselves.

In order that any method of production, pictorial or otherwise, may serve as a process of fine art, it must not be automatic and mechanical, but must be so far under the control of the man who employs it, that he can bring the result into more or less complete agreement with the conception existing in his mind. Now, to talk of photography as a merely mechanical art, is simply to display ignorance which self-respect would seek to conceal. The character of plate; the time of exposure; the manner of development; the time of the year; the hour of the day; the point of view; the introduction of figures or otherwise, their pose and grouping; the character of the lens used; the method of printing, and the modification made in it—all these are under the control of the operator, and upon these the character of the result depends.

It is quite true that much of the photography that one meets with is not artistic, but that is equally true of very many paintings and drawings, and it does not follow that photography is incapable of artistic results, as many people too hastily assume. In this, as in so many other instances, it is not so much the method as the man who uses it, that determines the excellence or otherwise of the result.

The reasons for refusing to photography the rank of a fine art in 1873 were summed up by no less an authority than Mr. P. G. Hamerton, in the following statements:—(1), It is false in local colour, putting all the lights and darks of natural colours out of tune; (2), It is false in light, not being able to make those sub-divisions in the scale which are necessary to attain relative truth; (3), It is false in perspective, and

consequently in the proportions of forms; (4), Its literalness and incapacity for selection and emphasis are antagonistic to the artistic spirit. He finally summed up the matter by asserting that photography was not a fine art and could not be made one.

However true these criticisms may have been in 1873, they are not applicable with anything like the same force, if indeed they are applicable at all, to the photography of the present time. It is in the highest degree probable that they will be altogether inapplicable to the photography of the future. The first objection—i.e., the falsity in local colour, which was perfectly sound at that time—has, to a great extent, been removed by the introduction of orthochromatic methods, and the defect may fairly be expected to disappear entirely as these methods are developed. The correct rendering of gradations of light and shade, apart from the effect of colour, is a matter of exposure, development, and the character of the emulsion, and it is not difficult to find examples in which a wide range of tones is represented in a very satisfactory manner. Falsity in perspective, and in the proportion of forms, is apparent only, and depends on the position of the eye from the picture. Whenever it is met with, it results from the use of short focus lenses, and can be easily remedied by the use of lenses of sufficient focal length. Three objections out of the four have been deprived of their foundations by improvements in the methods of the art, and by increased knowledge of its capabilities. The remaining objection is of a somewhat different order.

It has been contended that art is but an accurate representation of nature, and if this be true, how can the rank of fine art be denied to photography? To take only two examples: What other method can represent with equal success the intricate grace of a leafless tree, or the ever-changing beauties of the clouds? But this definition would not be generally accepted as satisfactory. It would be denied by many that art was necessarily a representation of nature at all, and even if the need of truth to nature were admitted, the truth is idealised, and not of literal representation would be implied.

What the artist really tries to represent is not so much the thing itself, be it animal or landscape, sea or sky, as the impression which the thing produced on his mind; and in order to convey this impression to the observer, he selects this and rejects that, emphasises one point and tones down another. He likewise endeavours to put into his picture that undefinable something which is recognised as characteristic of the best work, and which for want of a more precise term, is generally spoken of as "feeling" or sentiment. Upon the extent to which photography lends itself to similar treatment and the production of similar results, its title to the rank claimed for it must largely depend.

In the matter of selection and emphasis it must be conceded that photography is much less elastic than painting. A photographer cannot always leave out an unsuitable object; he cannot alter form; he cannot at will increase the apparent size of a thing. It would be wrong to conclude, however, that he is altogether at the mercy of his subject. In portraiture, the pose, background, mode of lighting, and in fact almost everything, is under his control. In outdoor work the point of view can be altered, and the conditions of lighting selected, in order to get the best result. The introduction of a figure suitably posed and lighted will often give the required emphasis. Careful and thoughtful printing will likewise do much towards the attainment of the same end. Selection and emphasis in photography may be comparatively difficult, but it is not impossible.

To put sentiment into a photograph is more difficult than to put sentiment into a painting, because the methods and conditions are less elastic. This "feeling," however, is painfully absent from many paintings, and may, in fact, be taken as characteristic of high-class work only. To obtain it in a photograph may, therefore, be looked upon as a considerable artistic achievement. And can it not be done?

Is there not sentiment, and sentiment in a high degree, in many of Sutcliffe's studies? The cold, misty, autumnal evening, with the breeze which will soon tear the few remaining leaves off the trees; the wild, wintry-looking sky, harbinger of the wind that shall sing the dirge of the wreck on the beach; the rapidly coming twilight, bringing rest from toil to both man and beast; are not these successfully and admirably rendered? Take as another example Tolley's *On the Lonely Shore*, with its harmonious composition and chiaroscuro. Observe how true the picture is to its title and the idea which the artist wished to convey, and notice especially the emphasis which is gained by the skilful introduction of the figure. Again, in Green's photograph of *The Head of Buttermere*, what a capital picture is made out of the simplest materials, and how admirably the height of the mountain, the loneliness, and the general atmospheric effect are portrayed! And last, but not least, is there not feeling and harmony to at least the same extent as in many paintings in many of Emerson's studies in the Norfolk Broads? These examples are not cited for the purpose of making invidious distinctions, but because they are recent and are familiar to most lovers of photography. Are they not enough to show that in landscape work at least the best photography—and it is on the best that judgment must be based—is truly artistic? What painter has done anything much better than Mayland's wonderful photograph, *There's Sorrow on the Sea*.

When we pass to *genre* pictures and portraiture, surely the case is still stronger. Here the photographer has matters more under his control. Is there not artistic treatment of a very high order indeed in H. P. Robinson's *Dawn and Sunset*, *When the Day's Work is Done*, and *Wayside*

Gossip, to say nothing of his numerous other productions? Are not Sutcliffe's studies of fisher folk as admirable as the majority of similar studies done with the pencil or brush? Do we not yet remember Malby's *Strengthening the Understanding*, and Gridley's *The Good Flask*?

In portraiture it must be admitted that the great bulk of the work done is bad—bad technically—worse artistically—but then this is equally true of much portrait painting. The capabilities of an art are, however, judged from its best results, and not from the worst. Photography is the method of portraiture for the million, and this alone would insure its continued existence. But it has higher claims, and people rightly set considerable value on a photographic portrait by one of our most eminent artists in this branch. Truth, which is of great importance in these cases, is not difficult to obtain, nor is it excessively difficult, by proper treatment, to throw into the picture some of that sentiment and character which is essential to all good portraiture. Referring now to examples in the late exhibition at Pall Mall, it is safe to say, in the first place, that those who examined Mendelssohn's grand head of Mr. Perigal will not soon forget it. Is there not, too, a peculiar charm about Hollier's portrait of Miss Terry, in spite of some criticisms which might be made respecting the lighting of the face and its background? To go a little further back, some at least will remember Byrne's *Lady in a Grecian Dress*. It is not very rash to assert that there is much "fine art" in these examples and in many others which might have been mentioned if these had not come first into mind, as in not a few of the portraits which are seen at the Academy. How many painters of to-day have done anything more vigorous and characteristic than Debenham's head of F. Barnard?

It is not necessary to cite further examples. The claims of photography to be recognised as a fine art are, as a matter of fact, being gradually admitted—a result due entirely to the labours of the minority of the craft, who bring to their work sound, artistic training and a careful study of its difficulties and capabilities. Already the leading newspapers criticise the exhibition in Pall Mall on the same footing, so far as the pictorial part of it is concerned, as they criticise an exhibition of drawings or paintings. It is unfortunate, however, that the critics do not always display even a decent knowledge of the art which they criticise, and particularly of the special technical difficulties which have to be contended against.

I should be sorry to weaken the argument by seeming to claim too much. It would be ridiculous to assert that photography is entitled to equal rank with painting. Some things it can do which painting cannot do, but in most respects it is undoubtedly inferior to the older art. It lacks at present, and probably for some time to come, the power and mystery of colour. It is much less elastic, and, whilst answering to a very considerable extent to the will of the artist, it does not, at present at any rate, leave him that complete control which is essential to the production of the very highest work. Moreover, it imposes strict and somewhat narrow limitations both as to choice of subject and the mode of treatment. Limitations of a similar kind are, however, inseparable from other graphic arts, and painting itself is not altogether untrammelled. To admit, as we are bound to do, that photography does not rank with the very first of the fine arts is a very different thing from admitting that it is not a fine art at all. Such an admission I, and think you also, would altogether decline to make. Holding then this belief, let us not be satisfied with mere technical efficiency, but let us each endeavour, by systematic cultivation of whatever artistic faculty may be in us, by careful and painstaking study of every subject we undertake, to make good individually our claims to be in reality, and not merely in name, artists in photography.

C. H. BOTHAMLEY, F.I.C., F.C.S.

"MEMENTO MORI."

It is often said that lords of the soil and the voluptuous plutocracy occasionally find time hang heavy on their hands. This is probably quite as true as the statement of the good Dr. Watts that the satanic denizen of another place obligingly furnishes the idle with plenty of mischief. Once upon a time a satiated imperial personage offered a prize for the invention of a new and original pleasure. History refuses to tell us how many entrants there were; probably in those remote centuries there were no unemployed, or a close and exciting competition might have resulted instead of, as we are entitled to conclude, no contest. The issue would be different to-day under our high-pressure *regime* of ceaseless change and novelty. The recently deceased heir to an English marquise, who was an amateur photographer, was wont to distil amusement from persuading his friends to feign death, so that he might photograph them in a position of monumental recumbency. The eccentric earl's inner object never transpired. His pictures impressed one with the fancy that the "sitters" were calmly chewing the cud with closed eyes, which, as we often hear mention of the meditative cast that steals over their features, is an aspect that must be met with in the really defunct. We have here an illustration of the strange and several uses to which photography is applied. The still juvenile fact that it is possible to accurately transfer the features of the dead to paper by scientific means will merit, in company with the twin truth as to pictures of the living, the notice of the

future analytical historian as he reviews the conditions of nineteenth century existence, and may afford food for the pencil of the apocryphal person from New Zealand when, having finished his sketch of the ruined basilica at the top of Ludgate-hill, he proceeds to explore the remains of the second Babylon, like another Schliemann in another Mycenæ.

It is almost if not quite a truism to assert that there is no stage of life in which photography does not perform a useful, necessary part, while in death its services are capable of much more extended application than is at present the case. Shakespeare's—or Bacon's—Seven Ages are now depicted by an eloquent substitute for words; for the modern prototype of the Melancholy Jacques may moralise over photographs of the entire septet, from the "infant mewling and puking in the nurse's arms," down to the doddering dribbler in his second childhood; and when silence comes he may have the camera carried to the very edge of the tomb, and secure the only unalterable expression the human countenance has at its command. It is singular that in these days of ultra-realism post-mortem photographs are not in greater request. The notion of obtaining them does not, presumably, occur to the average mind until too late for concrete embodiment; but if fashion once turned her fickle footsteps in this direction it is difficult to predict to what lengths the innovation would go. Like the gentleman in Lord Lytton's play of *Money*, Mr. Photographer would do "anything to oblige"—especially in these hard times. One of the peculiar experiences related by Mr. Hubert in a discursive but candid paper read by him before the London and Provincial Association last winter, was that of being suddenly called upon to photograph the dead body of a little girl, and latterly Mr. Cowan drily informed the same Association that he once photographed a corpse by combined natural and artificial light. To the hysterically inclined these gruesome confessions may impart a shudder, and but that the Christmas literature provided for us by the proprietors of the *JOURNAL* takes the austere shape of the *ALMANAC*, one might have suggested that with such a theme a thrilling photographic creeper could be written, and the commission handed to Mr. Wilkie Collins or Dr. Conan Doyle, whose graceful pen seems to have quite forsaken these pages for the lurid literature of the bookstall. Or if that idea was received with cold disdain, what could be more instructive and entertaining at this festive season of the year, when ghosts are in such great demand, than the adventures of a well-conducted impalpability, constructed, not of the time-honoured thin air, but of such spectral and serviceable materials as Ag Br and Drescher's Extra Hard? Sculptors, painters, and novelists have ghosts, and very substantial ones some of them are; but these privileges of the higher arts are denied to us, who should therefore seize the chance of securing something novel and striking that would stand the rigid analysis to which no respectable ghost ever thinks of objecting.

We are not in the habit of perpetuating the features of the departed as such in so great a variety of ways that we should despise the assistance of photography if it were once generally called into use. Painters show us great people and sovereigns lying in state; sculptors stick chilly effigies of dead warriors and ecclesiastics on the tops of cathedral tombs, and the worker in brass executes tablets that are enduring—but ugly. Each of these methods conduces to glorified untruthfulness, being done to order or paid for by results. Lower down that ladder the first step of which is bronze, and the others silver, gold, titles and diadems, canvas or Carrara canonisation is out of the question. Nor does the familiar album of the middle-class parlour table, plethora of portraits as their originals were when living, often contain a later memento of them after the heart has made its final beat. Surely, if it were generally known that we had in our midst ready and accomplished experts like Messrs. Hubert and Cowan, willing at a moment's notice to step round and execute a commission of this ghostly description, our albums and walls would at last boast something worth inspection. By never having the departed photographed we miss a great deal worth possessing. Here, in the aforesaid family album, are the features of that generous uncle who, true to his promise, remembered us in his will. How consoling to have a replica of the last benevolent smile of one who had kept his word and left us—a suit of mourning wrapped up in his best wishes! Furthermore, we might value a picture of the family misanthrope who had a sour visage all his life and a beatific one after it; of the unhappy wretch who always looked at the camera as if it were a lion in his path, and now basked in the sweet sheen of post-mortem peace; of the artificial cynic, whose features wore their natural clothing for the first time; the painted belle, minus her rouge and pencillings; the worried man without his care; the small debtor absolutely undaunted by the threat of the coffee-coloured paper; the hypocrite without his mask of sanctity; the lively man who at length was grave and severe, &c., &c., &c. Again, if we yearned for something colossal, did

not Messrs. Eastman and Walker prove to us the other day that we can do without the sculptor and the painter, and have no more ruinous bills for brass and marble? We can have a paper enlargement which is permanent—whilst stone and brass are not, or rather sculptors and tablet-workers do not say they are, so, of course, they cannot be! What a pity somebody wasn't before me with this astounding discovery a year ago, when that inquisitive Langholm *savant* published his experiences; we could then have talked to him on the subject of relative permanence with greater confidence and the certainty of confuting him and others who were sceptical of the staying powers of br-m-do and pl-t-n-type images!

Dead men tell no tales, and also possess the inestimable virtues of keeping still and wearing a natural expression, so that a post-mortem photograph might at least be depended upon for accuracy of resemblance and freedom from movement. In place of the little yellowed prints one sees under glass at some cemetery headstones, which prints are usually photographs of the deceased when living, we could substitute something more realistic; renew it as often as necessary, and thus have the departed or their counterfeits always with us. An expiring man would be soothed by the reflection that he would go down to posterity in something more than name. Even the poor devil who cannot soar above a joint-stock grave, might have a glazed carbon print on the lid of his "common elm," if it were considered necessary to supplement the painfully bald information of the brass plate. Professional photography as an industry is languishing: it might receive a welcome fillip if it became known that, like the undertaker, the photographer was prepared to take a share in executing the last sad offices for our dear brother. Mr. Mould, the undertaker, it will be remembered by readers of *Martin Chuzzlewit*, was always studiously attentive to those upon whom he considered it probable he would be shortly called to wait in his professional capacity; is it within the precincts of possibility that the portrait photographer in addition to his other troubles may, like Mould, some day conceive it his duty to be attentive to those upon, &c.? If it is, we shall have the consolation of knowing that such photographs will be far less ghastly, disagreeable, and untruthful than those now prevalent of many living people, than which nothing could well be worse. However repulsive some of us may consider the question of post-mortem photography, it is inextricably bound with two or three matters of public polity. Should the practice become general it might be the forerunner of the abolition of such standing horrors as the Paris Morgue, for the French authorities could have the unclaimed suicides photographed, and the pictures shown only upon request just as well as exhibiting the bodies to the gaze of morbid sensation seekers. In like manner, to come nearer home, some future legislator might propose a short Bill abolishing compulsory inspection of corpses by coroner's juries, as an officially certified photograph of the remains would serve as well as viewing them—a practice which to many sensitively balanced minds is an unmitigated terror, and in every respect as indefensible as it is barbarous. Photographs of the departed hung upon our walls might also be made to serve a purpose akin to that of the corpse at the feasts of the ancient Egyptians, by perpetually reminding us that, unlike the results obtained upon the rival printing surfaces already mentioned, life is neither permanent nor indestructible, and that the mortal clay is sadly given to yellowing and fading under the influences of agents more or less inimical to its longevity than H₂S is to photographic prints.

MANSTON MOORE.

WHAT IS HYDROQUINONE?

THE above question having been put to us by a number of our friends, we thought it would not be uninteresting to give our readers a brief review of the chemistry of this new developing agent and some statement of its general properties.

A few words may not be out of place here in explanation of the method of spelling the word as given above. Some writers in English use the term "hydrokinone;" but in looking into the matter we find this is simply an adoption of the German word without much change, whereas the correct English word used by the best scientific authorities is "hydroquinone." The reason for the latter method of spelling appears to us to be a good one; it is because the body under discussion was formerly obtained from quinic acid, one of the substances associated with quinine in Peruvian bark. We therefore prefer the word hydroquinone rather than hydrokinone, and for like reasons we reject the word hydrochinone, also used by some authorities.

Hydroquinone belongs to a class of organic bodies that the chemist calls diphenols, and hence it is sometimes called quinol; but the former name is that more commonly used. It was first obtained by Caventou and Pelletier, about the year 1820, as a product of the dry distillation of quinic acid, a compound found in Peruvian bark and a

by-product in the manufacture of the well known alkaloid quinine. The above chemists did not make a thorough examination of the body, and called it pyroquinic acid because they obtained it by heating quinic acid. Some time afterwards Wöhler found that he could obtain the same body by combining hydrogen and quinone (a product of the oxidation of quinic acid with manganese dioxide and sulphuric acid) and gave it the name it now bears, hydroquinone. He further found that hydroquinone could be best prepared by passing sulphurous acid gas through a warm saturated solution of quinone which has some of the undissolved substance suspended in it.

It is very interesting to note how the researches which had for their object the artificial production of the alkaloid quinine have also given us a long list of new chemical compounds that are gradually becoming useful to man as their properties are studied. Hydroquinone is one of these bodies, and although we cannot make quinine from it, yet there appears to be a great field for it in its applications to photography.

After hydroquinone as a product of the dry distillation of quinic acid had been studied, it was found to be obtainable from other sources. The leaves of the bearberry (*Arbutus uva ursi*) contain it combined with glucose, also the leaves of wintergreen (*Pyrola umbellata*). From both these sources it can be obtained by boiling the aqueous extract with dilute acids. But further study showed it to be related to benzol, the product of coal tar, and a process was soon devised to manufacture it from aniline, which is a derivative of benzol and the source of so many interesting organic compounds. The method of procedure is as follows.

One part of aniline is dissolved in eight parts of sulphuric acid and thirty parts of water, and to the cooled solution two and a half parts of potassium bichromate dissolved in water are gradually added. To the brown fluid thus obtained potassium sulphite is added, and the whole mixture is finally shaken with ether. The ether is allowed to rise and the fluid below is drawn off and rejected. By distilling the ether solution a residue is obtained which is dissolved in the smallest quantity of hot water; sulphurous acid and animal charcoal are then added, and the solution is boiled and filtered. On standing the hydroquinone separates out in hexagonal rhombohedral prisms.

The substance thus obtained sublimes in monoclinic plates, which on solution in water again gives the crystals mentioned above. It has a slightly sweet taste and melts at 169° C. It is readily soluble in hot water, alcohol, and ether (at 60° Fahr. one part takes seventeen parts of water for solution). It reduces silver nitrate solution, and also alkaline solution of copper sulphate. It forms a compound with sulphurous acid gas, which may account for the fact that it works better in a developer which contains sodium sulphite. It may possibly be still further improved by adding sulphurous acid to this solution of sulphite and hydroquinone. The result of its oxidation is quinone, the product mentioned above, which is also obtainable from aniline by oxidation.

We have given our readers a brief review of the principal chemical properties of this exceedingly interesting developing agent. It is not as energetic as pyrogallol in its reducing power, but the results obtained are softer and the negatives are less liable to be stained. Furthermore, the fact that the reducing action of the developer is less energetic, allows of its better preservation, and the same solution can be used for the production of a great many more negatives than a similar solution with pyrogallol as the active agent. At present the price of hydroquinone is considerably higher than pyrogallol, but should there be a demand for this new agent it will be manufactured cheaply, and the reduction in price will be similar to that which took place when pyrogallol became a popular developer.

We recommend all our readers to try this new developing agent, and even at the present prices the advantages and comfort obtained in its use fully compensate for the extra expense incurred in using it.

—Anthony's Photographic Bulletin.

A LADY'S VIEWS ABOUT RETOUCHING.

In an age of all-abounding vanity the lover of his species must experience an inward satisfaction in learning, through the medium of the Woolwich County Court, that there exists a lady who declines to pay for her portraits on the plea that they were too good-looking. The photographs were "tonched up." They made her younger than she was. Her hair was straight, while in the manipulated sun-pictures it was wavy. In vain did the artist plead that in "touching up" the plate he only met a customary requirement of his clients to look a little better than their best. The Spartan lady scorned the insinuation. *She* did not wish to be "flattered and tittivated up." Like Oliver Cromwell, she desired the Sir Peter Lely of Woolwich to present her face to the world as years, good-nature, and a frankness better than beauty have made it. If there were wrinkles, she wished them; and if her hair was straight, whatever might be the prejudices of the Woolwich matrons in favour of waviness, straight must her locks go down to posterity. Unlike Topsy, she was not one of

those who preferred "wool to har." Unfortunately, however, the judge decided against her, though, for the credit of maligned human nature, one might have wished that a lady so little dominated by the weaknesses of her sex could have won the case she so valiantly defended. But his Honour, after a long experience of the average woman as she appears in county courts, had come to the conclusion that she goes to the photographer not to get a likeness, but a picture. Accordingly, in default of the Cromwellian lady giving the artist specific orders to make her appear "just as she was," he was compelled to come to the cynical conclusion that she desired him to take the "ordinary course of procedure," namely, to "make the customers look their best." From this point of view the rejected portraits were "reasonable likenesses," and must be paid for at the same rate as if they had been all that the courageous lady required. We regret to record the decision, for it adds one more piece of judge-made law to the fringe which is almost daily getting round the photographic art and its applications. Henceforward the science which we had faintly hoped was to preserve the lineaments of man and his surroundings with a fidelity which admits of no prevarication is to play the flatterer like the pencil of the painter or the chisel of the sculptor. And what is more, the judge has ruled, and county-court law it must ever be, that the sun, or the servants of the sun, are to flatter the sitters, touch them up beyond recognition, and turn back by a stroke of the brush the dial of time, unless the client declares in advance that he or she desires the Orb of Day to be uncompromisingly truthful.

All this is pitiful, but we fear it is fact nevertheless. The sun, especially in a day of supersensitive plates, is capable, almost without an interval of reasonable time, of imprinting on a sheet of glass every passing mood of the person who passes before it. The result may not be a portrait. It is not an average likeness. It is simply a photograph of the appearance which the person presented at the moment when the light was let in on the chemicalised plate, be that the usual or the unusual aspect of the sitter's countenance. This is his business, not the sun's. Hence that wooden figure, and that supernaturally grim countenance, which in the early days of the art we had learned to recognise as the "photographic face," have almost disappeared from the family albums. Before the sitter has time to pose he is "taken." He—or more likely she—is trying to look her best, is wondering whether her hair is smooth, or his shirt-front unruffled, when a click is heard, and the gentleman in the velvet jacket blandly informs his victim that all is over. No longer are the dismal minutes of torture required, or the sacrifice to duty compelled to fix his occiput in the iron head-rest of collodion days. Almost ere he knows that he is before the face of the exposed plate the mischief is done. But for that very reason it is seldom satisfactory. The customary frown has not had time to be replaced by the unwonted grin, or the crow's-feet show with a needless amount of fidelity. Thus have arisen a race of subsidiary artists whose business it is to improve on nature. These are the "touchers up," and that the profession is an important one a glance at the columns of any photographic journal will afford the scepticist the most convincing proof. The fact is that the photographer has inherited many of the traditions and most of the prejudices of the old portrait painter. The defiant attitude beside a sham marble pillar and a red curtain, with the forefinger on a copy of the *Elegant Extracts*, which pretty clearly marks the date of the earlier efforts of Daguerreotypy, was a survival of a former day. The touching up is another. The photographer has never—as it was at one time thought he would—entirely displaced the painter. For he could never flatter with the ease which the fashionable portrait painter always did, and always will do. However, by means of touching up he is doing his best to pander to the weakness of mankind. There was at one time—perhaps is still, though by this period he must have made a fortune—an ex-Confederate general who prospered amazingly in Mexico owing to his skill as a photographer enabling him to take a very pale portrait, the great ambition of a Mexican being to look as like a white man as art will allow. The photographer has begun to learn—and a photographer's autobiography would be an entertaining book—that no man or woman ever believes himself or herself to be as plain or as prosaic-looking as he or she actually is. Hence the "customary procedure," with the occasional revolt of the emancipated woman, and the county court to follow.

In former days it was not so easy to reject a canvas once it was done. Yet the annals of painting afford not a few instances of that form of revolt. Cromwell's injunction to Lely stands by itself, and even then it is by no means certain that the courtly painter carried out his instructions to the ultimate "pimple and wart." He, probably enough, interpreted the Lord Protector's injunction as intended mainly for the use of the coffee houses frequented by the Cropheads. When an ugly old peer refused to pay for a portrait which was only too truthful, Hogarth threatened that if it was not removed in three days he would add a "tail and other appendages," and sell it "to Mr. Hore, the wild-beast showman." Du Bost went further than this, for in default of getting paid for his work he exhibited the portraits of an offended client and his wife as *Beauty and the Beast*, an act which so enraged the lady's brother that he cut it in pieces. On the case being tried before Lord Ellenborough it was decided that as the picture was a libel the plaintiff could only recover for the loss of the paint and canvas. This story is on a par with that of the modern artist who, being refused his price by a wealthy Manchester man on the plea that he had taken a shorter time to paint

his portrait than had been stipulated, settled the question by devoting the departed days to lengthening, little by little, the ears of his patron. In later times, when another plutocrat refused the portrait of his daughters, the painter simply exhibited them as *The Three Graces*, and found exceeding profit in so doing. Libels on his enemies have always been a favourite trick of the enraged artist. Thorsvaldsen made a godless German sculptor sit for the portrait of the impenitent thief on the Cross. Horace Vernet, after his dispute with Rothschild, depicted him as the plunderer running away with the spoils in the famous *Prise de Smala* at Versailles; and Gros, to wreak his vengeance on Marshal Bessieres, who had cut him, set the soldier among the plague-stricken people in Egypt holding his nose. Guido represented Pope Innocent as a demon; and three or four years ago there was a huge pother in Paris over M. Jaquet painting Alexandre Dumas as *Le Juif de Bagdad*. All this is very amusing—and very wicked. But the modern sensitive plates, which will in an instant perpetuate in the most minute details anything which passes before them, ought to be more truthful and less libellous. They will even show little incidents which the photographer did not observe with his unassisted eye, and no doubt, skillfully managed, might be introduced into a court of law as evidence of a faction fight in Ireland, or a street riot in London, which there would be no controverting. Even a bird in flight, a racehorse in full gallop, or an express train passing a station, can be caught. Here touching up is impossible, for any tampering with the plate could be at once detected.

—Observer.

THE CRYSTAL PALACE PHOTOGRAPHIC EXHIBITION.

As promised last week, we now give the schedule of classes:—

ART DIVISION.

Class A (Outdoor Photography).—Section 1, Pure landscapes; 2, Landscape, with figure; 3, Architecture, (a) exterior, (b) interior; 4, Instantaneous photographs, including marine subjects.

Class B (Indoor Photography).—Section 1, Direct portraiture; 2, Home portraiture; 3, Enlargements.

Class C (General).—Section 1, Groups; 2, Combination pictures; 3, Photographs mounted in optical contact; 4, Ceramic photographs; 5, Orthochromatic photographs; 6, Photo-mechanical pictures; 7, Micro-photography*; 8, Bromide prints by contact; 9, Carbon pictures.

Class D (Transparencies).—Section 1, Photographic transparencies for decorative purposes; 2, Photographic lantern slides.

Class E (Stereoscopic Photography).—Section 1, Stereoscopic slides—paper; 2, Ditto, glass.

APPARATUS DIVISION.

Class A (Woodwork, &c.).—Section 1, Cameras and fittings, including detective cameras; 2, Appliances for paper and film photography; 3, Tripods and studio stands; 4, Studio furniture, including upholstery.

Class B (Optical).—Section 1, Lenses; 2, Instantaneous and time shutters; 3, Finders and view meters; 4, Enlarging apparatus; 5, Lanterns; 6, Appliances for artificial illumination; 7, Stereoscopes.

Class C (Cheap and Popular Sets).

Class D (Dry Plates and Films).

Class E (Surrounds).—Section 1, Monnts; 2, Frames specially suitable for photographs; 3, Albums and cases.

Class F (General Appliances, and Plant).

Class G (Cycles fitted for Photographic Purposes).

LANTERN DIVISION.

Regulations and other information respecting the Competitive Lantern Entertainments, which will take place during the exhibition, may be obtained on application to the Executive Committee.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 17,634.—“A Process for Producing Engravings in Relief.” C. CHÉDIAU. —Dated December 22, 1887.

No. 17,693.—“Improvements relating to Means for Fixing and Clearing Photographic Pictures or Images.” Complete specification. H. B. BERKELEY. —Dated December 23, 1887.

PATENTS COMPLETED.

PHOTO-CHEMICAL PRINTING.

No. 1681. WILLIAM WILLIS, Bromley, Kent.—February 2, 1887.

My invention has for its object the production upon paper or other surfaces of photographic pictures, or images in platinum—that is to say, pictures or images of which the colouring matter or pigment is platinum. It differs from the processes of photo-chemical printing described in the specifications of my former patents, viz., No. 2011, dated June 5, 1873; No. 2500, dated July 12, 1878, and No. 1117, dated March 15, 1880, in which processes (as far as they relate to platinum) the paper or other surface is coated with a solution of a salt of platinum, and sometimes other salts, and also with a solution of ferric oxalate. These solutions are applied, either separately or mixed, to the paper, and in all cases the sensitive coating of the paper contains a salt of platinum and ferric oxalate. After exposure to light, the prepared surfaces are treated with one or other of the developing solutions described in the said specifications.

* Is not this a misprint for photo-micrography? The two terms convey a totally different meaning.—EWS.

Hitherto no means have been known by which the salt of platinum could be employed entirely in the developer or developing solution, instead of wholly or partly in the sensitive coating of the paper, or other surface as above set forth. I have, however, now discovered a process by which I can accomplish this result. For this purpose I apply to paper, or other suitable material, which has been rendered sensitive by a coating of ferric oxalate and afterwards exposed to light, a developer containing salts of platinum and certain soluble phosphates (or other salts, in which the ferric oxalate image produced by exposure to light is insoluble, or nearly so), with or without the addition of potassic oxalate, potassic tartrate, ammoniac citrate, or other salts which tend to increase the rapidity and vigour of the development. By this process I avoid the necessity of using salts of platinum in the sensitive coating of the paper or other surface. I thereby greatly diminish the cost of the process and can obtain good results without heating the developer.

Moreover, I obtain a slower developing action, so that it is possible to watch the progress of development, and to arrest it at any desired moment by washing the print in a solution of acid.

According to my present invention I use paper, wood, woven fabric, or other material, the surface of which I prepare and render sensitive for photographic purposes by the application of a coating or coatings containing ferric oxalate, with (or without) the addition of a salt of lead or of mercury, or mixture thereof, and without any salt of platinum.

I first prepare the paper or other surface by the use of this coating as herein-after specified. I then expose it to light under or behind a negative, and then develop the picture by means of one of my improved developing solutions hereinafter specified, or other suitable solution containing a salt of platinum.

For preparing or coating the paper or other material, I employ for ordinary purposes an aqueous solution of ferric oxalate containing in each fluid ounce about sixty (60) grains of ferric oxalate $Fe_2(C_2O_4)_3$; but I may use less or more of the latter according to the result desired to be obtained. I am of course aware that there are other salts of iron sensitive to light, but the oxalate is best for my purpose. I sometimes mix or dissolve in the ferric oxalate a salt of mercury or of lead or a mixture of these salts; for instance, I dissolve in one fluid ounce of the ferric oxalate solution above described, from one grain to three grains of mercuric chloride. Or I apply solutions of a salt of lead or mercury or a mixture of these salts to the paper or other surface either previously or subsequently to coating the same with ferric oxalate. I find the mercuric salt very useful where a warm tone or effect somewhat resembling that of sepia is desired.

I do not confine myself to aqueous solutions of the above-named salts.

The paper thus coated, after being dried, is ready for use. If two coatings are applied to the paper or other surface, it should be dried between the application of the first and second coatings. After its exposure to light under or behind a negative, I apply to it the developing solution.

I prepare an improved developing solution or developer as follows, that is to say:—I use solutions of various soluble phosphates. I have been most successful with the following, viz.:—the monosodic or disodic, the monopotassic or dipotassic or the mono-ammonic or diammonic orthophosphates, or mixtures or combinations of these salts with one another, and with or without the addition of other salts, such as potassic oxalate, ammoniac citrate, and others. In all cases I add to these solutions or mixtures of solutions a salt of platinum. I mix a solution of this salt with the above-named solutions or I dissolve the platinum of salt in them. The platinum salts most suitable for my purpose are the ammoniac, potassic, and sodic chloro-platinites, the ammoniac, potassic, and sodic bromo-platinites, or mixtures of them, and in some cases I use a very small quantity of a platinum salt, such as ammoniac, potassic, or sodic chloro-platinate.

I usually prepare this developing solution as follows, that is to say:—I dissolve in one fluid ounce of water, one hundred (100) grains of di-potassic orthophosphate, forty (40) grains of potassic oxalate and ten (10) grains of potassic chloro-platinate; or I make it in another manner, viz., by dissolving in one fluid ounce of water, one hundred (100) grains of diammonic orthophosphate, thirty-five (35) grains of ammoniac citrate, and ten (10) grains of ammoniac chloro-platinate; or I make similar developing solutions with the salts previously mentioned. I make also developers containing only phosphates and salts of platinum, that is to say, I may make a developer by dissolving in one ounce of water about one hundred (100) grains of mono potassic, or di-potassic orthophosphate, or mixtures of these salts, and ten (10) grains of potassic chloro-platinate.

The developing solution is applied to the paper or other surface (after the same has been exposed to light) by pouring it over the same, or by immersing the paper therein, or by floating the paper thereon, or by means of a brush, or otherwise. It is applied cold, warm, or hot, as desired. A cold solution usually takes longer to effect the development of the picture than a hot one. The strength of the solution may be varied; usually the best results are obtained by strong solutions of the phosphates and other salts; the platinum salt will ordinarily be used in the proportion of from five to ten grains of the salt to one fluid ounce of the developer.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I wish it understood that I claim—1. The process or method in which I sensitise the surface of paper or other material by the means herein specified, then expose the surface to light, and then develop the picture or image by the use of a solution containing a salt of platinum, as above set forth. 2. The production or development of photographic pictures or images in platinum, by the application of a salt of this metal to a surface which has been previously rendered sensitive by the application of a ferric salt and exposed to light. 3. Paper, or other material, which has its surface prepared and rendered sensitive for photographic purposes by the application of a ferric salt and a salt of mercury, or of lead, or of both mercury and lead, as above set forth.

IMPROVEMENTS IN BEARINGS FOR PHOTOGRAPHIC ROLLING PRESSES, ROLLING MACHINES, AND THE LIKE.

No. 1830. WILLIAM EDWIN MOSS and JOHN MITTON, Birch-passage, Alfreton-road, Nottingham.—February 5, 1887.

In the improved system indicated by the title of our said invention we adopt a

more simple plan of construction than has hitherto been introduced, the cost of production being likewise thereby lessened, whilst at the same time friction is reduced to a minimum.

In photographic rolling presses, rolling machines, and the like, each bottom bearing, constructed according to our invention, consists of two friction rollers working in recesses or slots and revolving on pins attached to the body of the machine. The top bearing is formed by two friction rollers, but to a loose cap, and is arranged in the same manner as the bottom bearing.

IMPROVEMENTS IN WASHING PHOTOGRAPHIC PRINTS AND IN APPARATUS THEREFOR.

No. 12,292. ARTHUR MARRIOTT, 13, Swann-street, Loughborough, Leicester.—
September 10, 1887.

This invention relates to the washing of photographic prints by the action of cold water, and it has for its object the improved construction of apparatus whereby this operation can be automatically performed in a more expeditious and thorough manner than heretofore.

The invention comprises the use of a cylindrical vessel of suitable dimensions, and constructed of any suitable material at, or near, the lower end of which is fixed a water-tight bottom; at the bottom of this vessel, and rotating close to it is a water wheel with a convenient number of arms; this wheel is a little less than the inner diameter of the vessel and is secured to a vertical axis working freely in a lower bearing secured to the bottom, and an upper bearing formed in a bar placed across the top of the vessel.

This wheel is driven by a number of water jets set at a suitable angle on the bottom of the vessel, each jet being supplied with water from a central reservoir underneath the bottom provided with a supply pipe, or by any convenient arrangement.

Immediately above this water wheel is a false bottom resting on bearings secured to the sides of the vessel. It is formed in the shape of an air propeller with a convenient number of propellers, and to prevent the prints from slipping through them the space between each is filled with a perforated metal plate, placed in a vertical position.

To prevent the prints from collecting in the centre by the action of the water, the centre space above the false bottom is occupied by a hollow perforated cone; and to prevent the vessel from overflowing, there is an opening in the side, near the bottom, connected with a pipe, which is carried up the side to a convenient height, and then bent down again in the form of a syphon. At the upper bend of this pipe or syphon is a small air inlet provided with a tap, and by opening or closing this inlet the pipe may be used as an overflow pipe or as a syphon to empty the vessel.

The action of the apparatus is as follows:—The prints to be washed are placed in the vessel above the false bottom, and the water entering by the jets turns the water wheel, the action of the water wheel forces the water through the false bottom in waves in a circular direction, and the whole of the water in the vessel is kept moving by this action, the prints are gently turned over and over, and are kept constantly in motion until they are removed.

IMPROVEMENTS IN TELESCOPIC FRONTS AND OBJECTIVES FOR OPTICAL LANTERNS.

No. 14,809. ALFRED WRENCH, 39, Gray's Inn-road, London, W.C.—
October 31, 1887.

My invention consists of an improved combination telescopic front for optical lanterns, and is constructed so that the tube which carries the lenses called the objectives may be moved to any desired position to suit lenses of various focus by means of rackwork adjustments. I first make a wide ring, provided with a bridge bearing and pinion, the ends of the pinion having suitable mill-heads to turn it by. This combination is called a jacket (No. 1), and into this jacket I slide a tube provided with a suitable rack, which gears into the before-named pinion. At one end of this tube I fix a jacket (No. 2), and I make a second tube (No. 3), with a rack and jacket fitted to it, to slide into No. 2 tube. Into this tube and jacket (No. 3) I slide a third tube with a rack only fixed to it (No. 4), and into this tube I fit a barrel (containing the lenses, which may be of any suitable combination) having at its front end a pivoted plate or shutter of the usual description. The jacket No. 1 has a suitable screw thread at one end to screw it into the front of the lantern, and the length of the jacket is preferably one inch. The tube and jacket No. 2 is preferably four times the length of No. 1, and the tube No. 3 is increased in length and amount equal to the length of its jacket. The tube No. 4 is also the amount of jacket longer than No. 3. It will be seen that when placed together, i.e., the various tubes slid inside each other, the total length is only that of the tube No. 4, but when extended (or racked out) the total length is about three times that of tube No. 4.

Although I employ three rackwork tubes to form my improved combination front, it is obvious that two, or any larger number, might be employed without departing from the nature of my invention. I am also aware that a telescopic front, with one rackwork objective, and that a barrel to slide into a single rackwork objective, is not new, but my invention of two or more rackwork tubes in combination, forming a telescopic front, is new.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—In a telescopic front for optical lanterns the combination of a jacket and two or more tubes, each with a rack and pinion adjustment, forming a telescopic lantern front substantially as described; the combination of two or more tubes with rackwork adjustments, and an extra tube with a rack arrangement for the barrel E to fit into it; the general combination forming my improved telescopic front for optical lanterns substantially as described.

AUSTRALIAN AWARDS.—We learn that Messrs. Watson & Sons are so fortunate as to have been the recipients of no fewer than seven awards for photographic and optical goods sent this year to the Adelaide Exhibition; two for photographic apparatus being of the first order of merit, those for microscopes, surveying instruments, telescopes, mathematical instruments, and limes for lanterns, securing awards of the second class.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 3	Notis	Institute, Shakespear-street.
" 3	Carlisle and County	Society's Rm., Lowther-st., Carlisle
" 3	Glossop Dale	Society's Rms., Norfolk-sq., Glossop
" 3	North London	Myddelton Hall, Upper-st., Islington
" 3	Sheffield	Masonic Hall, Surrey-street.
" 3	Sutton	Society's Rooms, 18, High-street.
" 3	Paisley	Paisley Museum.
" 3	Holmfirth	
" 3	Bolton Club	The Studio, Chancery-lane, Bolton
" 4	Coventry and Midland	Provident Dispensary, Coventry.
" 4	Edinburgh Photo. Society	Hall, 20, George-street, Edinburgh.
" 4	North Staffordshire	Mechanics' Institute, Hanley.
" 4	Photographic Club	Anderston's Hotel, Fleet-street, E.C.
" 5	Bolton Photographic Society	The Baths, Bridgman-street.
" 5	Dundee and East of Scotland	Lamb's Hotel, Reform-st., Dundee.
" 5	Glasgow Photo. Association	Philosophical Soc. Rms., 207, Bath-st.
" 5	Leeds	Philosophical Hall, Leeds.
" 5	London and Provincial	Mason's Hall, Basinghall-street.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

LAST Tuesday night, at the ordinary weekly meeting of the above Society, held at 5A, Pall Mall East, London, Mr. William England, Vice-President, occupied the chair.

Mr. W. F. DONKIN said that he had been trying hydroquinone as a developer for lantern slides: he had brought a sample of the developer mixed more than three weeks ago, and which had developed three or four dozen plates; they would see that it was still nearly colourless. The hydroquinone cost 2s. 4d. per ounce. He prepared the solutions as follows:—

Solution A.

Hydroquinone	1 drachm.
Metabisulphite of potash	4 ounce.
Water	8 ounces.

Solution B.

Sodium carbonate, recrystallised	5 ounces.
Ammonium bromide	50 grains.
Water	1 quart.

Mix A, one part, with B, three parts. With a fully exposed plate the development occupied ten minutes. Supposing a plate to have been but just exposed enough, it was possible to go on developing without the slightest trace of fogging. The developer did not discolour; it seemed as if it could be used indefinitely, so might be as cheap or cheaper than pyro. He used Fry's special bromide lantern plates.

Mr. W. H. HYSLOP asked if he did not get yellow stains sometimes.

Mr. DONKIN thought he obtained traces of such with over exposure and quick development.

Mr. LEWIS M. BIDEN had tried the developer; on one occasion he left a plate in it for three hours, and no fog resulted; nevertheless, he had produced fog with it sometimes.

The CHAIRMAN remarked that Mr. Donkin's slides before the meeting were very bright and clear.

Mr. DONKIN had only tried one experiment with the developer upon stripping films; it answered admirably.

Mr. HYSLOP had developed plates with hydroquinone and sulphite of soda, which plates had been exposed for sixteen, thirty-two, up to one hundred and twenty seconds; there was no difference in the results except in the case of the first one. On Mawson's plates he could only get green stains with it.

Colonel W. L. NOVERRE brought samples of the paper and substratum of Eastman's stripping films, which substratum had a ghost of the developed image upon its surface, as mentioned by him at a previous meeting. He thought the residual image to be due to a partial removal of the substratum by hot water.

Mr. T. BOLAS thought that perhaps the products of oxidation of the pyro caused the stain and rendered the film beneath insoluble.

Mr. W. BEDFORD suggested that two white paper spots should be gummed on the top front surface of each slide, to be placed at the bottom, next the light in the lantern. He also thought that each exhibitor of slides at the Society's meetings should bind his slides with paper of a distinctive colour or pattern, to favour easy sorting.

Mr. HYSLOP thought that success in taking yachting photographs depended much upon the operator being a sailor. With the captain's consent he would go to the wheel and move the steamboat into different positions, then explain to the helmsman what positions he wanted when the racing commenced; he would then go nearer to the yachts than he would be likely to take the risk of doing for a landsman; this enabled a larger view to be taken. His views of the *Thistle* were taken at probably not a greater distance than 100 yards, with a Dallmeyer's single landscape lens of 30 inches focus, and upon 18 x 14 plates; he used a double Kershaw shutter, but could not say that he quite approved it, because if a sea came over it, it had a tendency to stick afterwards. He had not found the damp or other influence of sea air to injure plates at all, even in long voyages, but he had not carried them into places of high temperature. When possible he had the machinery of the boat stopped for a moment while making the exposure, to stop vibration.

Mr. BIDEN knew of an instance of cockroaches eating the gelatine of a damp negative.

The CHAIRMAN thought that a single lens was better than any other, whenever it was possible to use it; he never used anything else upon his views of Swiss mountains.

Mr. BEDFORD was of the same opinion. He had seen several photographs taken by the flashing magnesium light, but in them the flashes had not been rapid enough to anticipate movements by the sitters.

Mr. HYSLOP's experience was the same.

Mr. SHEPHERD had found pyroxylene for enamel collodion to answer about as well as gun cotton for igniting the magnesium. He thought the fineness of division of the magnesium powder to have much to do with the rapidity of the flash.

Mr. BOLAS knew of provincial photographers who were using the flashing light in their business, and for dark interiors with success, even when living figures were included.

Mr. DONKIN thought that various portions of the compound could be placed at different distances, and ignited at the same moment by an electrical current passing through minute lengths of platinum wire, so as to get diffusion of light.

Mr. W. E. DEBENHAM had photographed a meeting of the Pharmaceutical Society more than twenty years ago, by a flashing magnesium light from a powder mixed for him by Mr. Larkin.

Mr. BEDFORD had seen a cat successfully photographed by it, but she could not be induced to sit a second time.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

ON Thursday night, December 22, at the ordinary weekly meeting of the above Association, held at the Masons Hall Tavern, City, London, Mr. J. Traill Taylor presided.

Mr. NORMAN MACBETH read a paper upon *The Construction and Requirements of Portrait Art* [this will appear in a future number].

The CHAIRMAN supposed that the 50 x 40 size mentioned in the paper had its analogue in the photographers' 5 x 4 plate. Photographers were slaves to the plate makers in the matter of sizes; a 7 x 5 plate was much wanted; in America it is largely used as a standard size. He used 8 x 5 plates because they would cut into other good sizes. Did Mr. Macbeth think it well to have platforms which could be rotated slightly after the sitter was posed?

Mr. MACBETH replied that the plan would do; he preferred a square platform, the line being often advantageous.

Mr. F. A. BRIDGE had been impressed when at Edinburgh with the peculiar lighting of Mr. Macbeth's studio; all the illumination came from very high up, but the effect was fine; he had never been in a finer studio.

The CHAIRMAN said that Mr. Macbeth had spoken of the advantage of having blinds rising from below; the late Mr. Tunny, of Edinburgh, had tried that plan with advantage. A better plan was to have blinds coming both from above and below.

Mr. MACBETH stated that his studio was twenty-two feet high, and that its window was covered with grey baize cloth; the recess or cave below the window was very useful when copying pictures.

The CHAIRMAN remarked that it was an approximation to the "tunnel studio" of this country.

Mr. BRIDGE spoke of a West-end artist photographer who so arranged matters that his camera looked at the sitter through an orifice in dark grey curtains.

Mr. W. M. ASHMAN knew a photographer who had similar heavy curtains running upon lengths of gas piping. Too high a light caused occasional difficulty in lighting the dress and feet of the sitter properly; most photographers had not time enough with their sitters to do all suggested by Mr. Macbeth.

Mr. MACBETH thought that there was great necessity for the use in studios of lenses of longer focus than usual.

The CHAIRMAN remarked that Mr. Reutlinger produced charming pictures with a low studio.

Mr. J. HUBERT thought it to be of great importance to get an atmospheric effect between the sitter and the background, also that the shaded part of the face should be against the lighter part of the background when stereoscopic effects were desired. He disliked front light, which had a tendency to destroy delicate half tones.

Mr. A. COWAN thought that electric lighting would furnish any kind of illumination the artist might desire, a translucent screen being used as an adjunct; he had not seen equal results from magnesium.

The CHAIRMAN supposed that it might be different if magnesium were properly burnt.

Mr. W. COBB said that it was most reprehensible to pull the sitter about and lecture him just before the exposure.

Mr. COOKE remarked that with sitters who were like lumps of wood there was no alternative. He had seen a revolving platform in a photographer's studio at Hull; it was turned by means of a long handle.

Mr. HUBERT said that the operator must be an artist, or not all the "proportions" and instructions in the world would enable him to make a picture.

Mr. NISBET stated that photographic poses for busts and half-length figures were generally very good; but for full-length figures they were usually inferior to those seen in paintings.

Mr. ASHMAN had noticed at recent public exhibitions that some artist painters were introducing photographic poses.

Mr. W. M. AYRES thought that artists would have to learn from photographers.

Mr. MACBETH did not wish to assume the position of a teacher, but a man ought to speak his mind if any progress were to be made at all, and he had merely stated his own experience from a desire to advance the interests of photography; although a painter, he had been a photographer as long as many present, for he began work with the camera thirty-three years ago. The camera had brought to his eye many items previously overlooked. His taking up photography had brought down upon him some obloquy from artists; both parties should exercise kindness and forbearance to each other to advance the interests of art. Photography was far from being equal in experience to art. Photographers should study every effort made by artists to be original. There was a great limit to the exercise of art in photography, the operator being bound by an instrument, so that when he began to use his mind he found it difficult to get what he anticipated. In placing the sitter upon a platform he had been carrying out his own views; in the portraits by Raeburn the wonderful breadth was produced by the high horizontal line. He liked a high window, a good long studio, and lenses of long focus, and he thought that the magnesium light would do great things for photography in the future.

Mr. COOKE asked Mr. Ashman whether Millais copied photographic poses.

Mr. ASHMAN did not know, but painters now frequently introduced what were strictly photographic poses; such poses were not to be found in the National Gallery.

Mr. HUBERT said that as photographers had a great number and variety of sitters they had more experience in posing than painters, who sometimes might not have more than one sitter in a month, hence it was excusable if painters copied photographic poses.

CAMERA CLUB.

AN exhibition of lantern slides was given at the above Club, on Thursday, December 22, pictures being shown by Messrs. Dresser, Mason, Davison, Gale, Hussey, Finney, and England.

Mr. Dresser's slides were on gelatino-bromide plates (chiefly Fry's), the subjects being animals at the Zoological Gardens. Mr. Mason's and Mr. Davison's slides were of landscape and seascape, also on gelatine dry plates (Mawson's). Mr. Gale exhibited a selection of his wet collodion work from those recently adjudged the medal at the Pall Mall Exhibition. Mr. Hussey's slides were some collodio-bromide (Brooks's emulsion), and some gelatino-bromide, and included excellent landscape work. Mr. Howard Finney showed gelatino-chloride transparencies, and Mr. England slides made on specially rapid chloride plates. These plates were said to be so fast as to permit of reduction in the camera.

The lantern was worked by Messrs. Hussey and Lionel Clark, and Mr. Hussey employed a new regulator (introduced by Mr. Oakley) upon his oxygen bottle.

The subject for January 5 is *Pheidias and Photography*. Paper at eight p.m., by the Rev. F. C. Lambert.

NORTH STAFFORDSHIRE AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting was held on the 7th instant,—Mr. W. E. Leek in the chair.

It was decided that ladies should be admitted free as members, the annual subscription payable by gentlemen to remain 5s., as at present.

It was resolved that all the business of the Association be conducted by the Council alone, and that under no circumstances should any business matter be intruded upon the monthly meetings, which should in future be devoted entirely to matters photographic and entertaining.

The prints sent in for competition for a prize offered by Mr. Drummond having been examined and voted for, a photograph by Mr. Leek was found to be the winner.

The CHAIRMAN then offered a prize for artistic merit in a photograph, the competition to be held at the next meeting.

Messrs. Beech, Stanway, Varcoe, Lobly, and Dr. Crapper were elected members.

Correspondence.

Correspondents should never write on both sides of the paper.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

"Audi alteram partem."

To the EDITORS.

GENTLEMEN,—I also very much regret Mr. Donkin's absence from the last meeting of the Photographic Society of Great Britain, for I might have saved him from the annoyance of endorsing statements which are readily disproved.

I do not dispute that the names of all the candidates were distinctly read out by Mr. Donkin, but the simple question remains:—"Was he justified in including in the list the name of any candidate against whose nomination a formal written protest had been duly lodged without calling attention to the fact?" His reply to this is that no protest had come to his knowledge: hence, obviously, his difficulty in understanding the drift of the words quoted:—"—is a mistake," and I am glad to find that he is, therefore, personally exonerated from all blame in this matter. He only, however, succeeds in shifting the onus on to other shoulders.

After this statement, it need be no surprise to Mr. Donkin that no black balls were found in the ballot box, as none of those who were aware of the protest (and there were several) for one moment imagined that the name of the candidate against whom objection had been taken would be run in with some forty others. I may add, that personally, I had no opportunity of voting owing to my having left my seat to speak to Mr. Donkin on the subject, and before I had time to return thither, all candidates were declared "duly" elected, although Mr. Donkin says, "there was no attempt to hurry them through."

I was correctly reported as having stated that I handed in a written protest to Mr. Cocking late in the afternoon of the day of meeting; and in order that there shall be no possible mistake in the matter, I will enter into details of what then occurred.

Notwithstanding Mr. Cocking's attempt to account to Mr. Donkin "for the whole of his time from five o'clock . . . till a quarter to seven," &c., and thus inferentially any receipt of the protest, I did undoubtedly, at his request, occupy his own seat at his desk at or about five p.m., he at the time standing at my elbow, and then and there sign the nomination forms for several candidates, during which process I came upon the name of the candidate in question, which led me to ask Mr. Cocking who he was. He replied, and I believe with truth, that he did not know. I then said:—

"If he is, as I have reason to believe, connected with. . . . I shall enter a protest against his nomination." Mr. Cocking appeared somewhat excited about my strong expression of disapproval of the candidate, and after a few minutes conversation he produced a half sheet of paper upon which I wrote the protest, laying it upon the top of the pile of nomination forms in his presence. All this took place, and was witnessed by two gentlemen, neither members of the Society; and yet Mr. Cocking assures Mr. Donkin that "he has no recollection of seeing Mr. Wollaston at all till then (viz., eight o'clock), or of receiving any document from him!" Comment is needless.

I submit, sir, that it is clearly the duty of the officers of the Society, and not mine, to ascertain what became of the document which was duly lodged in the hands of the only official of the Society in attendance. And failing the production of the same, or an explanation satisfactory to the body of members, it is my intention, as a public matter, to demand a re-nomination of the proposed member, in order to give any member the opportunity if he so desire, of exercising his right to vote "Aye" or "No" in this particular case.

I do, and shall ever question the legality of the second vote (under coercion), that the minutes of the meeting of November 8 as entered were correct, for as a matter of fact they were not.—I am, yours, &c., Lennie, Chislehurst. S. G. BUCHANAN WOLLASTON.

MANCHESTER PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—The latter part of the report of the last meeting of the Manchester Photographic Society is not correct. Mr. Chilton did not use the words ascribed to him, and it is quite certain he did not speak in italics.—I am, yours, &c., A. BROTHERS.

Manchester, December 28, 1887.

DUNDEE EXHIBITION.

To the EDITORS.

GENTLEMEN,—Will you kindly allow me to point out to your readers, through your columns, the fact that the date for receiving entries for the above exhibition has been altered, in response to the expressed wishes of many intending exhibitors, to the end of January, 1888.

As the greater part of the space is already applied for, it would, however, be advisable that those who have not already entered should do so as soon as possible.—I am, yours, &c.,

JAMES RATTRAY, Hon. Secretary.

82, High-street, Dundee, December 24, 1887.

Exchange Column.

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

Will exchange candle ruly lamp for argentometer.—Address, R. S. JOHNSON, 64, Wellingborough-road, Northampton.

Will exchange a half-plate bellows-bodied camera with two double dark slides, all in good order, for a Hughes's triplexion lamp, in good order.—Address, J. DONALDSON, 42, St. Vigean's-road, Arbroath.

Answers to Correspondents.

* * All matters for the text portion of this JOURNAL, including "Exchanges," must be addressed to "THE EDITOR," 2, York-street, Covent Garden, London, W.C.

Communications relating to Advertisements and general business affairs to "J. GREENWOOD & Co.," 2, York-street, Covent Garden, London, W.C.

PHOTOGRAPHS REGISTERED:—

B. J. Taylor, Sheffield.—Photograph entitled "The Doll's Doctor." A. T. Mackenzie, Birnam, Perthshire.—Two photographs of the Right Hon. A. Peel, M.P., Speaker of the House of Commons.

- A. PUMPHRY.—Received.
W. L. NASH.—We have expressed your wish to the gentleman named.
H. B. BRAIN.—The ball and socket system was applied to the lens and camera thirty years ago by Mr. George Shadbolt.
T. BRAYWOOD.—Read an article on the subject in the ALMANAC for 1888, and if you wish further information write again.
S. W.—Magnesium in the state of powder can now be obtained at most photographic warehouses. The price is about 2s. 6d. or 3s. per ounce.

A. Y. E.—You certainly can have nothing simpler than the gelatino-bromide paper process. There is no process so simple and easy as this for making enlargements.

TYRO.—Any one selling pictures of the class you desire renders himself liable to fine or imprisonment, or both, under Lord Campbell's Act. No wonder your letter was returned.

B. CAOSBY.—The most convenient form of furnace for burning-in small enamel pictures is a gas muffle furnace. Mr. Fletcher, of Warrington, supplies an excellent one for the purpose and at a very moderate price.

WERNER & SON.—A bath for electro-silvering can certainly be made by adding a solution of cyanide to one of silver nitrate until the silver cyanide, at first copiously thrown down, is redissolved. Any ordinary battery will answer.

R. STEWART.—We must repeat what we said lately to another correspondent, that Hardwick's Manual (J. & A. Churchill) is the only work that will satisfy your conditions. Articles on retouching will be found scattered over the present and last year's volume of this JOURNAL.

W. S. A. says: "Having a quantity of the silver cuttings, I have burnt them and sifted to fine powder; how should I proceed to obtain the silver from it in its metallic form?"—Mix the powder with its own weight of a flux composed of equal parts of the carbonates of soda and potash, place in a clay crucible and fuse at a strong heat in a melting furnace, and do not hurry the operation. After the crucible has cooled the silver will be found as a button on breaking the pot.

E. S. H.—For the 5 x 4 camera the rapid lens mentioned in the postscript will prove very useful, especially as one of the pair may be used as a single lens. Obtain also another of about seven or eight inches focus. This may be either a single or a combination lens. For the larger camera obtain a doublet of about ten inches focus, capable of dividing so as to give a focus of twenty inches, and a similar lens of about seven inches, which may be used either in its entirety or divided.

W. HINKS asks advice on the following:—He says some olive oil has been accidentally dropped on a bromide enlargement which has been expensively finished in "black and white," and asks if there is any method by which it can be removed without injury to the picture.—The oil can no doubt be taken out by alternately moistening it with pure benzole and blotting it off with clean blotting paper. Some little patience may possibly be required, but in the end the treatment will be effectual.

H. B. (Subscriber).—You are evidently mistaken, no such article appeared in our ALMANAC for 1887. There is an article by the gentleman mentioned but it is on a different subject. The acetate toning bath will yield excellent brown tones and the lime bath a good black with the right kind of negative; but more depends upon the paper and the character of the negative than upon the particular toning bath employed. With an ordinary good sample of paper and a suitable negative almost every tone desired may be obtained with any toning bath.

SUBSCRIBER (Newcastle-on-Tyne) writes: "I have a photographic album which I am afraid has been lying in a damp place, for the leather back has turned to a milky-white colour on one side; perhaps it is something in the tanning of the leather. Can you suggest any treatment that will restore it? I may say that the album is of the best, and not a cheap article."—If the album be a valuable one we should recommend our correspondent to place it in the hands of a practical bookbinder. We imagine that it has simply become mouldy, but we cannot say without seeing it.

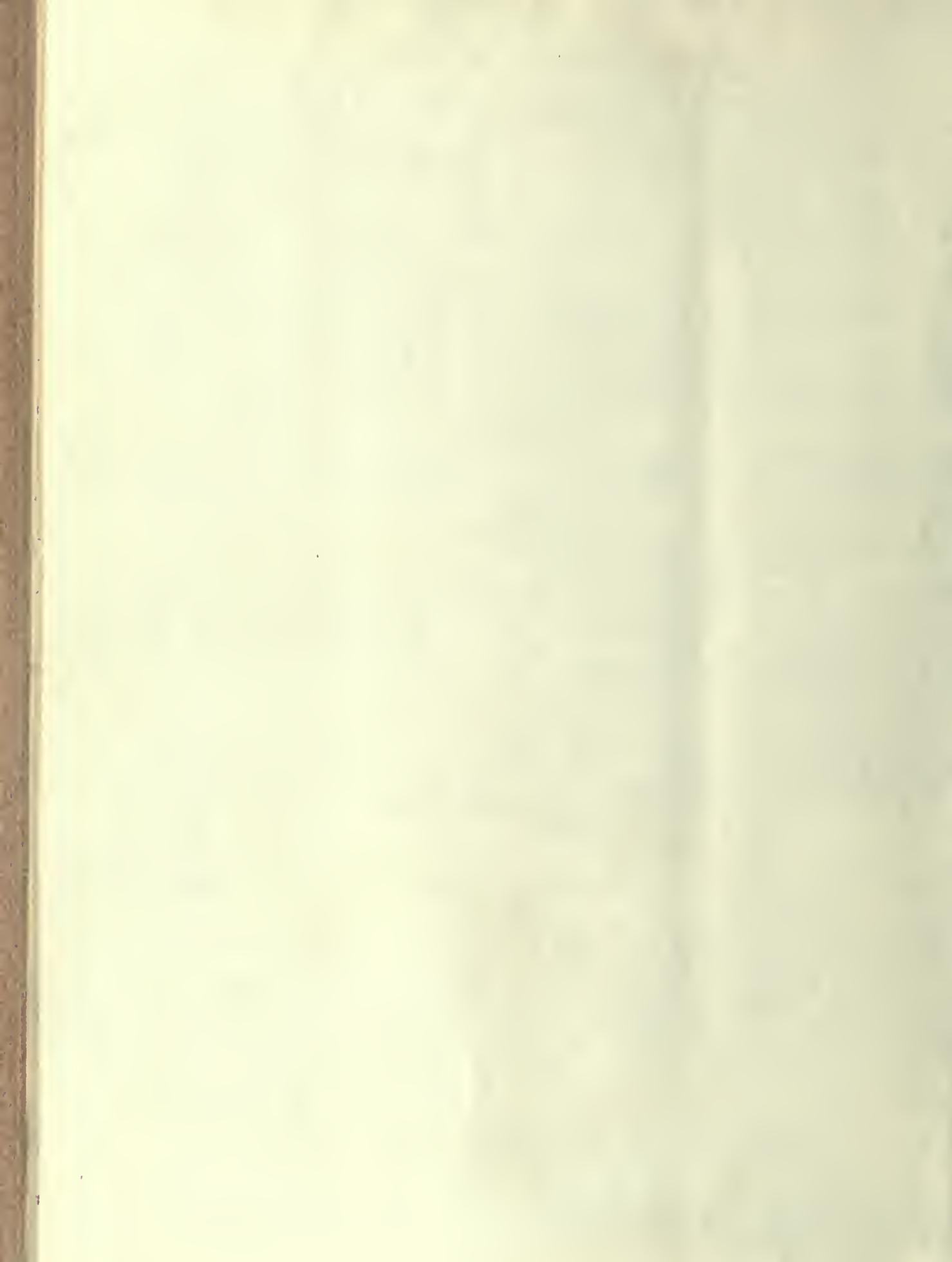
PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting of this Club, Wednesday, January 4, 1888, will be on Winter Photography.

PEOPLE'S PALACE, MILE END.—Among the Boxing-day attractions here were included two diorama lectures by Mr. F. A. Bridge. The views—consisting of a series of Windsor Castle, Jane Conquest, The Women of Mumble's Head, The Curfew, statuary, instantaneous effects, &c.—were exhibited on a very large scale, and were much appreciated.

LENS FORGERY.—We have been shown one of the clumsiest forgeries of lenses we have yet seen. A gentleman advertised in our columns for a 2 1/2 Dallmeyer portrait lens, and has received (on approval) a miserable old and old-fashioned French half-plate lens, having engraved thereon the name of Mr. Dallmeyer, although not in the same style or lettering as the genuine article. Let buyers beware of purchasing lenses from those of whom they know nothing or who object to having them sent to the maker for verification.

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